

**“WEIRD SEX SCIENCE” IN BRITAIN, ca.1900-1939:
NARRATIVES OF NATURALISATION AND ERADICATION**

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WEIRD SEX SCIENCE.

FROG TURNED FROM MOTHER TO FATHER.

AMAZING TRANSFORMATION THEORY.

The president of the Zoological section of the British Association, which is meeting at Edinburgh this week, led the way yesterday by quoting a case from America in which the mere injection of a serum into a rabbit permanently altered the nature of the descendants; which suggests that mere chemical manipulation of the body may promote evolution in a manner and degree not dreamt of by Darwinians.

The president was followed in the afternoon by Dr. Crow with a yet more hair-raising experiment. He showed how a female frog could completely change into a male frog, become a father instead of a mother—indeed, that the male was a sort of degenerate female. One such degenerate frog fathered a family all of which proved, as specialists in the newer laws of heredity expected, to be exclusively females.

So astonishing a theory of transformation was never seen or dreamt of, or the old subject of the determination of sex never more strangely illustrated.

Another American scientist has induced a hen to grow cock's plumage. Some practical results are already emerging from these curious studies in heredity and in the meaning of sex.

Just as certain eye-diseases never appear in the woman, but are only inherited from the woman, so in poultry it is as good as proved by recent workers in heredity that exceptional egg-laying capacity is inherited only from the cock bird.

Female qualities exist in the male and male qualities in the female, but are latent, and can in certain cases be brought out as well as proved to exist by a study of the offspring.

Fig. 1. "Weird Sex Science: Frog Turned from Mother to Father: Amazing Transformation Theory," *Nottingham Evening Post*, September 9, 1921.

Abstract

This thesis examines changing concepts and practices relating to sex variations—intersexualities, transformations of sex, and non-heteronormative sexual desires and behaviours—derived from the biological sciences and their impact in Britain through the Edwardian and interwar eras. Using a variety of published and archival sources, the thesis makes three main contributions to scholarship.

Firstly, it identifies tensions between narratives of naturalisation and narratives of eugenic manipulation that emerged as British biologists reconceptualised sex variations, sex differences, and sexualities more generally, following major discoveries in genetics and endocrinology around 1900, especially X and Y chromosomes and “sex” hormones. Even as biologists produced a new biology of sex within a profoundly patriarchal and queerphobic cultural environment, sex variations were pivotal to their endeavours, posing a plethora of challenges to long-standing cultural, theological, and legal proscriptions that construed such variations as unnatural and/or immoral.

Second, the thesis contributes to a vibrant area of scholarship on science popularisation by examining how leading biologists, F. A. E. Crew and Julian Huxley chief among them, exploited semi-popular and popular platforms, including Britain’s newspapers, to relate their sexological studies of sex variations to their social and eugenic agendas. In order to better understand this dynamic use of non-specialist scientific platforms, the thesis presents a new, *adaptationist* model of science popularisation.

Thirdly, the thesis explores the relationship between the private lives of scientists and the science they produce. In this regard it pays particularly close attention to Julian Huxley, arguing that what he referred to as his own “unresolved conflicts about sex” are reflected in his sexological studies, especially his inability to unify his field studies of avian courtship with laboratory-based studies of sex. By expanding scholarship on the rapid development and impact of biological models of sex differences and sexualities through the Edwardian and interwar eras, the thesis reaches towards a queerer science historiography.

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Introduction

This thesis examines how sex variations—intersexualities, transformations of sex, and non-heteronormative sexualities and sexual behaviours—were considered by biologists in Britain following major new discoveries in genetics and endocrinology from around 1900 until 1939. During the period, leading biologists from a variety of biological sciences—evolutionary biology, “reproductive” physiology, experimental zoology, genetics, endocrinology, agricultural science, and ethology—transformed the sexological landscape in Britain. This transformation superseded the late-nineteenth century sexological tradition, most often associated in British contexts with Havelock Ellis. It provided authoritative alternatives to theories of sexualities which had been derived from psychiatry and psychoanalysis and that had become widely disseminated across different genres of sexological writing. Equally important, it situated sex variations, especially occurrences of “sex change” and “homosexuality,” as important objects of scholarly and popular discourse at all levels of British society.

By exploring the role of biologists and the biological sciences in producing a new, modernist biological sexology in Britain through the early decades of the twentieth century, this thesis makes three main original contributions to science historiography. Firstly, it highlights tensions between narratives of naturalisation relating to sex variations, and associated calls for a more liberal approach to their occurrences in humans. These tensions, the thesis argues, emerged with a pernicious eugenic mentality that aspired to control humanity’s biological future. New ways of conceptualising sex in biological terms were thereby shaped by prevailing heteronormative standards of gender and sexual respectability, and generated some

profoundly queerphobic medico-scientific responses—responses that pathologised same-sex sexual desires and behaviours, and sex variations more generally, alongside calls for negative eugenic programmes, highly invasive medical interventions, and suggestions of prenatal manipulation. This much is consistent with existing scholarship on the situation in the United States (discussed below). But the following thesis probes deeper by closely examining in what ways this eugenically infused heteronormativity was achieved, the points at which it was poorly constructed or broke down, and the ways in which even resolutely heteronormative tropes and rhetoric were open to subversive interpretations or appropriation for queer ends. A key finding of this thesis is that the new biology of sex, especially as derived from the developing disciplines of genetics and endocrinology, was viewed by certain scientists and their interlocutors (including medical professionals, publishers, and journalists) as normal and natural.

A second original contribution to scholarship made by this thesis concerns the critical issue of the dissemination and popularisation of sexological texts, ideas, and rhetoric in Britain through the early decades of the twentieth century, a subject that is currently of great interest to historians. The thesis demonstrates that emerging biologies of sex produced new genres of sexological publishing through the period, much of it aimed at a popular readership. By surveying a wide variety of closely related texts, the thesis draws attention to significant differences in content between specialist/professional sexological writing and popular and semi-popular texts relating to sexological biology. Biologists, physicians, and their interlocutors used popular and semi-popular platforms, including Britain's newspapers, to achieve personal, social, and moral ends that were not open to them through specialist medico-scientific platforms, these including personal promotion, the promotion of

science as a benchmark of modernity, patriotic posturing, eugenics, and the desirability of sex selection. While these agendas may well inform the production of scientific investigations, their explicit avowal is rarely articulated in specialist publications. The thesis therefore introduces a new way of conceptualising the dissemination and popularisation of sexological concepts and rhetoric, and scientific and eugenic ideas more generally, which I term the *adaptationist model of science popularisation*.

This thesis makes a third key contribution to scholarship which concerns the complex relationship between the personal lives of scientists and the production of their science. Building on a generation of feminist scholarship that has situated gender as an important category of analysis in science historiography, Luis Campos has previously, and productively, considered whether sexuality has similarly acted as an important shaping influence on the pursuit of science. Developing Campos's analysis, this thesis pays especially close attention to one biologist, Julian Huxley, identifying a close resonance between his own account of his "unresolved conflicts about sex" and his (problematic) sexological studies.

In all three of the thesis's main contributions to scholarship—its exploration of tensions between narratives of naturalisation and pathologisation in early-twentieth-century sexological biology; the development of a new way of conceptualising science popularisation; and its consideration of how the sex lives of scientists effected their science—this thesis reaches towards the realisation of a queerer science historiography.

Queer Histories of Science

This thesis represents a development of my earlier work which explores how the biological sciences were pivotal to the emergence of a new, modernist sexology through the nineteenth century that sought naturalistic explanations of sex differences and sexualities. As I intend to highlight continuities in sexological mores between the late-Victorian and Edwardian eras, as well as significant variations, an overview of some key precepts drawn from these earlier studies will be useful. One study charted the first scientific reports of same-sex copulation in non-human animal species.¹ Another examined the medical and scientific sources of the pioneering German lawyer and sexual rights activist (“pioneer of the modern gay movement”) Karl Heinrich Ulrichs.² Seeking to demonstrate the occurrence of homoeroticism as a natural law, Ulrichs formulated an influential theory of sexuality that described men-loving men and women-loving women as intersexed (“hermaphrodites”). Across twelve unprecedented polemics published between 1864 and 1880, he presented a wide range of literary and medico-scientific sources to support his theory, including accounts of gay men and hermaphrodites that had been published by forensic writers and other physicians. He also used observations of leading anatomists and embryologists concerning the rudimentary foetal sex anatomy of mammals. The subject was highly disputed with different authorities supporting different positions. Some believed that the incipient embryo was without sex. Others thought they all began life as female; one theorist thought they were all male. Another view (adopted by Ulrichs) was that all foetuses began life in a hermaphroditic state. The idea was

¹ Ross Brooks, “All Too Human: Responses to Same-Sex Copulation in the Common Cockchafer (*Melolontha melolontha* (L.)), 1834-1900,” *Archives of Natural History* 36, no. 1 (2009): 146-59.

² Ross Brooks, “Transforming Sexuality: The Medical Sources of Karl Heinrich Ulrichs (1825-95) and the Origins of the Theory of Bisexuality,” *Journal of the History of Medicine and Allied Sciences* 67, no. 2 (2012): 177-216. Ulrichs’s biographer, Hubert Kennedy, rightly refers to him as “pioneer of the modern gay movement”. Hubert Kennedy, *Karl Heinrich Ulrichs, Pioneer of the Modern Gay Movement*, 2nd edition (Concord, CA: Peremptory Publications, 2005).

first forwarded by Edinburgh anatomist Robert Knox, initially in 1827/28 at the height of the infamous Burke and Hare bodysnatching scandal, and received considerable support with the discovery of the early co-existence of the excretory duct of the Wolffian body (mesonephric duct) and the Müllerian duct (paramesonephric duct), an observation that made anatomical bisexuality difficult to ignore thereafter.

Further articles have charted the importance of the principle of primordial hermaphroditism (dual-sexed origins) in Victorian evolutionary biology.³ Following Knox's suggestion, the notion that all the higher animals, including humans, are essentially hermaphrodite was deployed in multiple medical and scientific contexts in an effort to explain the development of sex variations including intersexualities, transformations of sex, and non-heteronormative sexual behaviours. The nineteenth-century's greatest champion of primordial hermaphroditism was Charles Darwin, who was an early convert to the theory. Notes entered in his unpublished notebooks, written around 1838, evidence his commitment to the principle that, in Darwin's words, "[e]very man & woman is hermaphrodite".⁴ Darwin was pivotal in phylogenising the principle of embryonic hermaphroditism, suggesting that early human ancestors must have been hermaphrodites. In his major sexological work *The Descent of Man, and Selection in Relation to Sex* (1871), he stated the idea this way:

It has long been known that in the vertebrate kingdom one sex bears rudiments of various accessory parts, appertaining to the reproductive system, which properly belong to the opposite sex; and it has now been

³ Ross Brooks, "Darwin's Closet: The Queer Sides of *The Descent of Man* (1871)," *Zoological Journal of the Linnean Society* 191, no. 2 (2021): 323-46; Ross Brooks, "One «Both» Sex«es»: Observations, Suppositions, and Airy Speculations on Fetal Sex Anatomy in British Scientific Literature, 1794-1871," *Journal of the History of Medicine and Allied Sciences* 70, no. 1 (2015): 34-73; See also Ross Brooks, "Queer Birds: Avian Sex Reversal and the Origins of Modern Sexology," *Viewpoint: Magazine of the British Society for the History of Science* 119 (June 2019): 10-11.

⁴ Paul H. Barrett, Peter J. Gautrey, Sandra Herbert, David Kohn, and Sydney Smith, eds., *Charles Darwin's Notebooks, 1836-1844: Geology, Transmutation of Species, Metaphysical Enquiries* (Cambridge: The Press Syndicate of the University of Cambridge, 1987), 384.

ascertained that at a very early embryonic period both sexes possess true male and female glands. Hence some extremely remote progenitor of the whole vertebrate kingdom appears to have been hermaphrodite or androgynous.⁵

Darwin's authoritative acceptance of the principle of primordial hermaphroditism influenced a new generation of modernist sexologists, including Julien Chevalier, Havelock Ellis, Sigmund Freud, Magnus Hirschfeld, and James Kiernan.

This thesis extends this exploration of the various ways in which sex variations were considered by biologists in Britain, and how their interventions shaped sexual knowledge in the country generally, into the twentieth century. With some notable exceptions, discussed further below, the relevance of biologists and the biological sciences to the production and dissemination of sexological knowledge and practices in twentieth-century Britain has hitherto largely been neglected. This is regrettable since, as I intend to demonstrate, new biologies of sex became enormously influential in both elite and popular contexts in the country through the Edwardian and interwar eras. This thesis therefore fills a lacuna in the scholarship on modern sexology.

Several historians have previously described the development of different sexological traditions in the country from the late-nineteenth century into the twentieth. Studies have usefully explored the early reception of psychoanalysis.⁶ Janet Weston has focused attention on medical (mainly psychiatric) treatments of sex

⁵ Charles Darwin, *The Descent of Man, and Selection in Relation to Sex*, 2 vols. (London: John Murray, 1871), 1, 207.

⁶ John Forrester and Laura Cameron, *Freud in Cambridge* (Cambridge: Cambridge University Press, 2017); Philip Kuhn, *Psychoanalysis in Britain, 1893-1913: Histories and Historiography* (Lanham: Lexington Books, 2017); Erik Linstrum, "The Making of a Translator: James Strachey and the Origins of British Psychoanalysis," *Journal of British Studies* 53, no. 3 (2014): 685-704; Dean Rapp, "The Early Discovery of Freud by the British General Educated Public, 1912-1919," *Social History of Medicine* 3, no. 2 (1990): 217-43.

offenders in England through the period.⁷ David Andrew Griffiths, Alison Oram, and Clare R. Tebbutt have, separately, studied concepts and practices relating to sex variations through the 1930s.⁸ Both Oram and Tebbutt chart how human transformations of sex—Oram prefers the term “gender-crossing”, Tebbutt prefers “sex change”—became prominent in Britain through the decade, especially in the popular press. Importantly, both historians stress that notions of gender-crossing/sex change, as they were promulgated in Britain’s newspapers and other popular platforms through the 1930s, do not map neatly onto present-day gender and sexual categories such as trans* or intersexuality. Oram describes how the reporting of gender-crossing stories promoted ideas of scientific modernity but that sensationalised newspaper representations of sex-changing bodies were nonetheless indebted to older notions and practices which had long conceived of gender-crossing and hermaphroditism as spectacle, including the continued exhibition of intersexed individuals in fairground and seaside sideshows.

Likewise, Tebbutt outlines ways in which local and national newspaper sex change stories promoted medical interventions as emblematic of scientific modernity and were generally rendered in a positive tone. She describes how, in both scientific and media contexts, sex characteristics were readily understood as mutable, an important aspect of early- and mid-twentieth-century sexology that deserves broader elucidation. Both historians—but Tebbutt more than Oram—situate the proliferation

⁷ Janet Weston, *Medicine, the Penal System and Sexual Crimes in England, 1919-1960s: Diagnosing Deviance* (London: Bloomsbury Academic, 2017).

⁸ David Andrew Griffiths, “Diagnosing Sex: Intersex Surgery and ‘Sex Change’ in Britain 1930-1955,” *Sexualities* 21, no. 3 (2018): 476-95; Alison Oram, “‘Farewell to Frocks’ – ‘Sex Change’ in Interwar Britain: Newspaper Stories, Medical Technology and Modernity,” in Kate Fisher and Sarah Toulalan, eds., *Bodies, Sex and Desire from the Renaissance to the Present* (Basingstoke: Palgrave Macmillan, 2011), 102-17; Alison Oram, *Her Husband Was a Woman! Women’s Gender-Crossing in Modern British Popular Culture* (Abingdon: Routledge, 2007); Clare R. Tebbutt, “Popular and Medical Understandings of Sex Change in 1930s Britain (PhD diss., University of Manchester, 2014), https://www.research.manchester.ac.uk/portal/files/54565577/FULL_TEXT.PDF.

of gender-crossing/sex change stories in association with the emergence of new medical technologies and interventions around 1930, especially the South African-born surgeon Lennox Ross Broster's treatment of endocrine conditions at London's Charing Cross Hospital. Broster's work on sex changes is also looked at by Griffiths.

Most studies of sexological traditions in early-twentieth-century Britain have centred on the writings of radical sex reformers and leading literary figures. Prompted by the injustices of the trials and imprisonment of Oscar Wilde in 1895, original works by British authors that drew heavily on continental sexology were first produced by homophile writers John Addington Symonds and Edward Carpenter and were aimed at a non-medical readership.⁹ Their polemics, however, initially had very limited circulation among their close-knit circle of radical freethinkers and sex reformers. Envisaging a more ambitious project, Symonds collaborated with Britain's leading sexologist, Havelock Ellis, on a new book, *Sexual Inversion*.¹⁰ The circumstances of their collaboration have been well covered in historical scholarship, most recently by Chiara Beccalossi, Sean Brady, Joseph Bristow, Ivan Crozier, and Jana Funke.¹¹ The work was first published in German in

⁹ On Carpenter, see Sheila Rowbotham, *Edward Carpenter: A Life of Liberty and Love* (London: Verso, 2008). On Symonds, see Emily Rutherford, "Impossible Love and Victorian Values: J. A. Symonds and the Intellectual History of Homosexuality," *Journal of the History of Ideas* 75, no. 4 (2014): 605-27; Sean Brady, *John Addington Symonds (1840-1893) and Homosexuality: A Critical Edition of Sources* (Basingstoke: Palgrave Macmillan, 2012); Sam Binkley, "The Romantic Sexology of John Addington Symonds," *Journal of Homosexuality* 40, no. 1 (2000): 79-103.

¹⁰ On Ellis, see Ivan Crozier, "Havelock Ellis, Eugenicist," *Studies in History and Philosophy of Biological and Biomedical Sciences* 39, no. 2 (2008): 187-94; Ivan Dalley Crozier, "Taking Prisoners: Havelock Ellis, Sigmund Freud, and the Construction of Homosexuality, 1897-1951," *Social History of Medicine* 13, no. 3 (2000): 447-66. Other works concerning the early development of the British sexological tradition, useful for further reference, include Kate Fisher and Jana Funke, "British Sexual Science beyond the Medical: Cross-Disciplinary, Cross-Historical, and Cross-Cultural Translations," in *Sexology and Translation: Cultural and Scientific Encounters across the Modern World*, ed. Heike Bauer (Philadelphia: Temple University Press, 2015), 95-114; Heike Bauer, *English Literary Sexology: Translations of Inversion, 1860-1930* (Basingstoke: Palgrave Macmillan, 2009).

¹¹ Jana Funke, "'We Cannot Be Greek Now': Age Difference, Corruption of Youth and the Making of Sexual Inversion," *English Studies* 94, no. 2 (2014): 139-53; Chiara Beccalossi, *Female Sexual Inversion: Same-Sex Desires in Italian and British Sexology, c. 1870-1920* (Basingstoke: Palgrave Macmillan, 2012), ch. 7 *passim*; Brady, *John Addington Symonds*; Ivan Crozier, "Introduction: Havelock Ellis, John Addington Symonds and the Construction of *Sexual Inversion*," in Havelock Ellis and John Addington Symonds, *Sexual Inversion: A Critical Edition*, ed. Ivan Crozier

1896 as *Das konträre Geschlechtsgefühl* by Georg H. Wigand, a reputable publisher and bookseller based in Leipzig. The book was reviewed in specialist medical journals, and received positively on the whole. However, in Britain neither the *British Medical Journal* nor the *Lancet* reviewed it, reflecting a generally standoffish, sometimes openly hostile, attitude towards the new sexology by the British medical establishment.

In the book, Ellis and Symonds delineated sexual inversion as a distinct and relatively rare kind of homosexuality, other expressions of which they considered to be common, especially in the absence of sexual outlets of the opposite sex and when, as in classical Greece, same-sex sexual relationships between certain males became established as a custom. Despite *Sexual Inversion* forming part of Ellis's multi-volume series of sexological books, *Studies in the Psychology of Sex*, it promulgated a congenital model of sexual inversion. Inspired in part by the theories of Karl Heinrich Ulrichs, Ellis and Symonds worked to establish that the cause of sexual inversion was to be found in the principle of primordial hermaphroditism, at the height of its considerable explanatory power in medico-scientific circles at the time (*Sexual Inversion* originally included a precis of Ulrichs's views written as an appendix by Symonds). In the words of the first English-language edition, discussed below, they wrote:

We can probably grasp the nature of the abnormality better if we reflect on the development of the sexes and on the latent organic bi-sexuality in each sex. At an early stage of development the sexes are indistinguishable, and throughout life the traces of this early community of sex remain. The hen fowl retains in a rudimentary form the spurs which are so large and formidable in her lord, and sometimes she develops a capacity to crow, or puts on male plumage. Among mammals the male possesses useless nipples, which occasionally even

(Basingstoke: Palgrave Macmillan, 2008), 1-86; Joseph Bristow, "Symonds's History, Ellis's Heredity: *Sexual Inversion*," in *Sexology in Culture: Labelling Bodies and Desires*, ed. Lucy Bland and Laura Doan (Cambridge: Polity Press, 1998), 79-99.

develop into breasts, and the female possesses a clitoris, which is merely a rudimentary penis, and may also develop. The sexually inverted person does not usually possess any gross exaggeration of these signs of community with the opposite sex. But, as we have seen, there are a considerable number of more subtle approximations to the opposite sex in inverted persons, both on the physical and the psychic side.¹²

Ellis, who wrote the scientific material, made little mention of Darwin in *Sexual Inversion*, but his approach to the subject, and the new sexology more generally, was indefatigably Darwinian.¹³ He situated sexual inversion within an evolutionary schema that moved from “lower” to “higher” stages of sexual evolution, beginning by discussing published reports of same-sex sexual behaviours in non-human animals followed by reports of sexual inversion in indigenous societies and then a historical narrative before proceeding to the ideas of contemporary sexological writers and the various case studies that are presented in the book.

Following its publication in German, *Sexual Inversion* was published in English in 1897 by the so-called “University Press,” erstwhile of Watford and the illicit enterprise of a conman, Georg Ferdinand Springmühl von Weissenfeld. Few who dealt with the business knew von Weissenfeld’s true identity or his criminal background, until the operation was shut down by the police in January 1902 and he died in custody. Prior to this, in 1898, *Sexual Inversion* was embroiled in the sensational prosecution of the bookseller George Bedborough and was duly banned, severely limiting its availability in Britain thereafter.

Other sex reformers embraced sexological science. Historians, especially Ivan Crozier and Diana Wyndham, have researched the Australian sexologist

¹² Havelock Ellis and John Addington Symonds, *Sexual Inversion* (London: Wilson and Macmillan, 1897), 132.

¹³ Rodolfo John Alaniz (University of Texas at Austin) is currently working on a project titled “Havelock Ellis, Darwinist.”

Norman Haire, who was resident in Britain between the wars and who—along with author and socialist campaigner Dora Russell—organised the World League for Sexual Reform Congress in London in 1929.¹⁴ Lesley Hall has researched the British Society for the Study of Sex Psychology (BSSSP), established during a visit to London by the leading German sexologist and sexual rights campaigner Magnus Hirschfeld in 1913.¹⁵ This small but committed group of radical reformers held meetings and produced publications through to the 1940s, but largely remained the preserve of niche intellectual and literary cliques who struggled to make much impact on wider British society.

Despite the fact that Ellis's sexological books had limited circulation in Britain, and the small group of BSSSP-associated sex reformers who followed in his path had a limited impact, historians continue to attribute the creation and dissemination of sexological knowledge through the early decades of the twentieth century primarily to Britain's radical sex reformers. Indeed, there are few other areas of historical scholarship where so much has been written about so little. Most recently, Laura Doan has looked to the BSSSP to help resolve, or at least move beyond, ongoing historiographical debates about how best to consider the disciplinary boundaries of sexology. Ivan Crozier has insisted that sexology should

¹⁴ Diana Wyndham, *Norman Haire and the Study of Sex* (Sydney: Sydney University Press, 2012); Ivan Crozier, "'All the World's a Stage': Dora Russell, Norman Haire, and the 1929 London World League for Sexual Reform Congress," *Journal of the History of Sexuality* 12, no. 1 (2003): 16-37; Ivan Crozier, "Becoming a Sexologist: Norman Haire, the 1929 London World League for Sexual Reform Congress, and Organizing Medical Knowledge about Sex in Interwar England," *History of Science* 39 (2001): 299-329. See also Ralf Dose, "The World League for Sexual Reform: Some Possible Approaches," *Journal of the History of Sexuality* 12, no. 1 (2003): 1-15.

¹⁵ Lesley A. Hall, "The British Society of the Study of Sex Psychology: 'Advocating the Culture of Unnatural and Criminal Practices'?", in *Sex, Time and Place: Queer Histories of London, c.1850 to the Present*, ed. Simon Avery and Katherine M. Graham (London: Bloomsbury Academic, 2016), 133-48; Lesley A. Hall, "'Disinterested Enthusiasm for Sexual Misconduct': The British Society for the Study of Sex Psychology, 1913-47," *Journal of Contemporary History* 30, no. 4 (1995): 665-86. See also Laura Doan, "Troubling Popularisation: On the Gendered Circuits of a 'Scientific' Knowledge of Sex," *Gender & History* 31, no. 2 (2019): 304-18; David C. Weigle, "Psychology and Homosexuality: The British Sexological Society," *Journal of the History of the Behavioral Sciences* 31, no. 2 (1995): 137-48.

be considered a discrete medico-scientific field.¹⁶ Sharp disagreement with Crozier's position emerged as historians and literary theorists took a 'transnational turn' in the study of modern sexology, charting and analysing the multidirectional global transmission of sexological texts, ideas, and rhetoric across disciplinary, geographical, and language barriers and thereby conceptualising sexology as a highly porous endeavour with loose disciplinary boundaries.

The dynamics of this lively debate are succinctly, albeit somewhat acrimoniously, conveyed in an exchange of views between Crozier and Heike Bauer that was published in *History of the Human Sciences* in June 2017 (the choice of publication aptly demonstrating the lack of attention afforded to the biological sciences in these debates). Following Crozier's unenthusiastic review of Bauer's edited volume *Sexology and Translation: Cultural and Scientific Encounters across the Modern World*, Bauer defended the view "that the science of sex was a porous field", Crozier then accusing literary theorists such as Bauer of underestimating disciplinary differences between literary and scientific fields ("occasionally when someone studying literature looks at a scientific field, they seem to see a porous mass of texts that anything can seep into and out of like a poorly-squeezed sponge").¹⁷

Doan has usefully sought to alter the terms of the debate about disciplinary boundaries of modern sexology which she asserts to have "reached an impasse", to have obscured other important aspects of the production and dissemination of sexological knowledge, and to be a "dead-end debate" that has "proven

¹⁶ See, for example, Crozier, "Introduction," especially 12-25.

¹⁷ Ivan Crozier, "Sexology, Historiography, Citation, Embodiment: Review and (Frank) Exchange," review of *Sexology and Translation: Cultural and Scientific Encounters across the Modern World*, edited by Heike Bauer, *History of the Human Sciences*, June 27, 2017, <https://www.histhum.com/sexology-historiography-citation-embodiment-a-review-and-frank-exchange/>.

irresolvable”.¹⁸ In a significant move which relates the study of modern sexology to science historiography, perhaps for the first time, Doan brings to bear on the situation a large and vibrant body of scholarship concerning the complex dynamics of science popularisation. This has helped elucidate the complex production and dissemination of sexological precepts. Interestingly, recent scholarship on science popularisation has echoed Doan’s dissatisfaction with simplistic models of the dissemination of scientific knowledge, especially what is referred to variously as the diffusionist, deficit, or ‘fried-egg’ model, by which elite scientists produce scientific knowledge in specialist contexts which only subsequently trickles down in a one-way direction to a lay public which absorbs it—or dumbed-down versions of it—without question.

This model was severely critiqued in a classic 1994 study by Roger Cooter and Stephen Pumfrey and several historians, including Doan, have subsequently developed more sophisticated ways of conceptualising the complex and varied ways in which scientific knowledge is produced and disseminated.¹⁹ Helen Piel, for example, has provided a microstudy of twentieth-century science popularisation by closely examining John Maynard Smith’s Penguin paperback *The Theory of Evolution*, first published in 1958. Repudiating the diffusionist model of the dissemination of scientific knowledge, Piel shows how Maynard Smith adopted a dynamic, interactive, and multi-layered approach to the book; in Piel’s words, “*The Theory of Evolution* reflects Maynard Smith’s multifaceted nature as a science

¹⁸ Doan, “Troubling Popularisation,” 305, 308, 316 n. 17.

¹⁹ Roger Cooter and Stephen Pumfrey, “Separate Spheres and Public Places: Reflections on the History of Science Popularization and Science in Popular Culture,” *History of Science* 32, no. 3 (1994): 237-67. Aside from Doan, “Troubling Popularisation,” other recent studies on science popularisation, all useful for further references, include Helen Piel, “Complicating the Story of Popular Science: John Maynard Smith’s ‘Little Penguin’ on *The Theory of Evolution*,” *Journal of the History of Biology* 52, no. 3 (2019): 371-90; Vassiliki Betty Smocovitis, “Disciplining and Popularizing: Evolution and Its Publics from the Modern Synthesis to the Present,” *Studies in History and Philosophy of Biological and Biomedical Sciences* 45 (2014): 111-13.

communicator and the interconnectedness between his professional and popular work and publications.”²⁰

For her part, Doan abandons the notion of popularisation altogether, seeking instead to develop a bespoke model by which to conceptualise the public dissemination of sexological knowledge or, in Doan’s words, “[t]o consider what model or models might replace popularisation in historicising how a scientific knowledge of sex travels beyond experts and the educated elite [...]”.²¹ Unfortunately, while Doan’s deft historiographical manoeuvring is to be welcomed—especially her association of sexology studies with science historiography—it falls short in delivery. In seeking to demonstrate more sophisticated models of conceptualising the production and dissemination of sexological knowledge, and—seemingly—her rationale for abandoning the popularisation model, she looks to the BSSSP. Doan circles the issue of the limitations of the Society, its modest membership and lack of discernible impact, but sticks with it, arguing that the BSSSP is an exemplar of what she terms a “ventilator” model of sexual knowledge which “structures knowledge as moving freely in the air, knowledge as circulating a ‘proper supply’ of fresh oxygen to replace ‘stagnant and vitiated air’” (the term “ventilator”, and its application to the BSSSP, comes from the playwright, and a founding member of the Society, Laurence Housman).²²

The only example that Doan provides of anyone outside the Society responding to the BSSSP’s endeavours is Virginia Woolf, whose diary entry for January 21, 1918 records some brief responses to an acquaintance who told her about

²⁰ Piel, “Complicating the Story,” 387.

²¹ Doan, “Troubling Popularisation,” 305.

²² Ibid., 315. Doan does present her “ventilator” model of the diffusion of sexological knowledge as just one alternative model to popularisation, concluding her article by stating that “I am certain there are many others.” Ibid.

a BSSSP meeting that had taken place in Hampstead. Doan highlights Woolf's amazement that subjects such as masturbation and incest were being openly discussed by both women and men "without shame" in a "surprisingly frank" manner.²³ While interesting, Woolf, a wealthy and literate individual capable of comprehending specialist scientific concepts, is hardly a convincing testament of the degree to which "a scientific knowledge of sex travels beyond experts and the educated elite". In relying too heavily on the cliquish BSSSP, Doan's analysis of dissemination loses something—the sense of substantial public outreach that the notion of popularisation succinctly conveys. Doan provides no means for considering how, and why, selected sexological ideas and rhetoric permeated British society writ large as they assuredly did through the interwar era and beyond.

This thesis complements studies and debates about the production and dissemination of sexological knowledge and practices in early-twentieth-century Britain by looking closely at how new discoveries in genetics and endocrinology, and the fervent disciplining and professionalisation of the biological sciences that ensued, transformed the ways in which key questions relating to sex determination, sex development, and sexual behaviour were considered in Britain, intellectually and popularly, from around 1900. The thesis thereby contributes to the queering of science history, a relatively new and rapidly developing evolution in historiography that is largely attributable to biologist and feminist scholar Anne Fausto-Sterling's ground-breaking book *Sexing the Body: Gender Politics and the Construction of Sexuality* (2000). Fausto-Sterling's work is now regarded as seminal to the inauguration of a "queer turn" in the biological sciences, in science history, and within the academy more generally (it is, for example, identified as a foundational

²³ Virginia Woolf, *The Diary of Virginia Woolf. Volume 1: 1915-1919*, edited by Anne Olivier Bell (London: Hogarth Press, 1977), 110.

text in the queering of biology in the popular 2016 book *Queer: A Graphic History*).²⁴

Fausto-Sterling applied core principles of the social construction of scientific knowledge to twentieth-century “reproductive” biology.²⁵ Challenging and historicising the prevailing use of dichotomies such as male/female, heterosexual/homosexual, biology/culture, Fausto-Sterling showed that—far from adhering to a rigid dichotomy between women and men—the early-twentieth-century scientists who first grappled with new discoveries in endocrinology and genetics accepted the ubiquity of intersexualities, sex metamorphosis, and diversity of sexual behaviours. She described how integrated accounts of differences in sexual behaviour (such as that developed by the American ethologist Frank Beach during the 1940s) that offered multifactorial explanations of sexual activity were superseded by resolutely deterministic accounts of sexuality, human and non-human, only in the postwar era. These new zoologically based epistemologies of sexuality reflected a culturally derived requirement for heterosexuality and rigid adherence to gender and sexual roles. Fausto-Sterling situates this important scientific genre in the context of 1950s political culture, particularly Cold War ideology.

Subsequent studies that have explored the development of modern sexological biology have chiefly focussed on the situation in the United States and on the Continent, especially Austria and Germany. Regrettably, they have largely eschewed Fausto-Sterling’s integrated approach and have tended to promulgate an overly neat division between endocrinology and genetics. This is somewhat problematic, given the high degree of shared scientific territory and the fact that

²⁴ Meg-John Barker and Julia Scheele, *Queer: A Graphic History* (London: Icon, 2016), 114.

²⁵ Anne Fausto-Sterling, *Sexing the Body: Gender Politics and the Construction of Sexuality* (New York: Basic Books, 2000).

twentieth-century biologists worked to master both genetics and endocrinology, and show their interconnectedness.²⁶ Major works on the discovery of “internal secretions”—hormones—and the development of organotherapy and endocrinology have been written by John Hoberman, Cheryl Logan, Nelly Oudshoorn, Celia Roberts, and Chandak Sengoopta.²⁷ The British context deserves more comprehensive historiographical attention, although the work of Merriley Borell and Diana Long Hall, published during the 1970s and 80s, remains useful.²⁸

Hitherto, historians who have scrutinised the highly gendered assumptions and practices of the first modern endocrinologists have largely focused on the singular gendering of internal secretions. Even before sex hormones were individually identified, it was generally assumed (erroneously) that ovaries produced a “female” hormone that shaped the sex characteristics of female bodies and testes produced a “male” hormone which shaped male bodies. Oudshoorn, for example, has described how emerging ideas about internal secretions as chemical carriers of masculinity and femininity were smoothly transposed onto long-standing gendered ideas about the gonads as agents of sex differences.²⁹

In this scenario, sex variations are simultaneously gendered and pathologised, with theorising scientists assuming (erroneously) that the “wrong” hormones are

²⁶ I am grateful to Gar Allen for pointing this out and for encouraging me to deal with genetics and endocrinology together. Private communication.

²⁷ John Hoberman, *Testosterone Dreams: Rejuvenation, Aphrodisia, Doping* (Berkeley: University of California Press, 2005); Cheryl Logan, *Hormones, Heredity, and Race: Spectacular Failure in Interwar Vienna* (New Brunswick, NJ: Rutgers University Press, 2013); Nelly Oudshoorn, *Beyond the Natural Body: An Archeology of Sex Hormones* (London: Routledge, 1994); Celia Roberts, *Messengers of Sex: Hormones, Biomedicine and Feminism* (Cambridge: Cambridge University Press, 2007); Chandak Sengoopta, *The Most Secret Quintessence of Life: Sex, Glands, and Hormones, 1850-1950* (Chicago: University of Chicago Press, 2006).

²⁸ See, for example, Merriley Borell, “Setting the Standards for a New Science: Edward Schäfer and Endocrinology,” *Medical History* 22, no. 3 (1978): 282-90; Merriley Borell, “Organotherapy, British Physiology, and Discovery of the Internal Secretions,” *Journal of the History of Biology* 9, no. 2 (1976): 235-68; Diana Long Hall, “Biology, Sex Hormones and Sexism in the 1920’s,” *Philosophical Forum* 5 (1973-74): 81-96.

²⁹ Oudshoorn, *Beyond the Natural Body*, 22-24.

acting on sex variant bodies and prompting highly invasive medical interventions aimed at “correcting” their action. Most significantly, historians have described how the Viennese endocrinologist Eugen Steinach hastily and irrevocably extended the study of internal secretions into the realm of sexual behaviour.³⁰ By 1912, he had succeeded in transplanting the sex glands of male guinea pigs into females and vice versa. The male guinea pigs developed female-typical sexual behaviour; they presented their posteriors to other males, inviting copulation. The females began to act like males, mounting other females. He achieved the same results with rats. Steinach lost little time in extending the results achieved in laboratory animals to humans. He developed the notion that homosexual men had abnormal testicular secretions, driving the development of the brain in a female rather than a male direction. He even claimed to see microscopic differences in the structure of the interstitial cells of the testes (cells responsible for the secretion of hormones) between homosexual and heterosexual men. This was hastily followed by human transplants. In 1917 Steinach described the results of transplanting a testicle from a heterosexual man into an “effeminate, passive homosexual man”. According to this report, the man was totally “cured”; he was said to have lost all attraction to men and to have developed normal heterosexual feelings. Although subsequent attempts at manipulating human sexual preference and for developing methods of sexual rejuvenation earned him a lasting reputation as a quack, Steinach’s research set the

³⁰ See, for example, Rainer Herrn and Christine N. Brinckmann, “Of Rats and Men: Rejuvenation and the Steinach Film,” in *Not Straight from Germany: Sexual Publics and Sexual Citizenship since Magnus Hirschfeld*, ed. Michael Thomas Taylor, Annette F. Timm, and Rainer Herrn (Ann Arbor: University of Michigan Press, 2017), 212-34; Cheryl A. Logan, “The Physiology of Erotization: Comparative Neuroendocrinology in Eugen Steinach’s Physiology Department,” in Gerd B. Müller, ed., *Vivarium: Experimental, Quantitative, and Theoretical Biology at Vienna’s Biologische Versuchsanstalt* (Cambridge, MA: MIT Press, 2017), 209-30; Sengoopta, *Most Secret Quintessence*, 75-82; Fausto-Sterling, *Sexing the Body*, 158-63.

stage for a century of investigations into the influence of hormones on sexual orientation.

Histories of modern genetics, as it was applied to sex-related subjects, have similarly tended to focus on academic discourses in the United States and in the German-speaking world. Garland E. Allen has pointed out that the first geneticists to devise models of sex determining mechanisms in the light of the rediscovery of Mendel's laws of heredity and the identification of the "sex" (X and Y) chromosomes recognised that such models had to account not just for discrete categories of "female" and "male" based on genital morphology and reproductive capabilities but also a multitude of variations in sex and reproductive biology such as parthenogenesis and intersexualities.³¹ Likewise, Sarah S. Richardson acknowledges that late-nineteenth-century biologists "understood sex as a complicated, spectrum-like, and highly variable phenomenon" (although Richardson specifies the late-nineteenth century in her discussion here, her analysis extends to the early years of the twentieth century in practice; for example, the image she reproduces alongside the above quotation is from 1915). She continues:

They were fascinated by the diversity of forms of sexual dimorphism and intersexuality in nature. Cases of hermaphrodites (possessing both male and female reproductive organs), freemartins (male-female twins in which the female has been androgenized in utero), and gynandromorphs (variants, often insect species, that exhibit typical morphological features of both sexes) appeared regularly in the scientific literature and were presented as holding the key to unravelling the biology of sex.³²

³¹ Garland E. Allen, "Thomas Hunt Morgan and the Problem of Sex Determination, 1903-1910," *Proceedings of the American Philosophical Society* 110, no. 1 (1966) 48-57, 48.

³² Sarah S. Richardson, *Sex Itself: The Search for Male and Female in the Human Genome* (Chicago: University of Chicago Press, 2013), 24.

Helga Satzinger, who has researched concepts of sex and gender in mainly German genetics, makes a comparable statement—inflected with a palpable sense of surprise—about the interwar period:

In the early 1930s, and in a way that still seems astonishing, apparently clear assumptions about sex differences were questioned by scientists themselves. This development, had it happened today, would be seen as an effect of postmodern feminist or even queer scholarship: biologists questioned the binary sex difference exactly at the main site of its usual incarnation within the paradigm of cell theory: the female egg and the male sperm.³³

Despite such acknowledgements that sex variations formed a substantial part of the early development of the new genetics of sex, their treatment does not generally feature as a significant part of Richardson's or Satzinger's studies, which is a shame. The focus of both historians is on charting how the Y and X chromosomes came to be viewed scientifically and culturally as signifiers of stereotyped gender roles through the twentieth century.

The diverse ways in which early and mid-twentieth-century biologists worked to accommodate all manner of intersexualities, transformations of sex, and non-heteronormative sexual behaviours, and their insistence that biological sex was potentially mutable in the higher animals, including humans, has not yet been comprehensively understood in historical scholarship. That said, certain studies have underscored the high degree to which sex variations were integral to the work of particular geneticists and, in some cases, more personally. Luis Campos has outed (at least for English-language scholarship) the prominent Dutch geneticist Hugo de

³³ Helga Satzinger, "Concepts of Gender Difference in Genetics," in *Heredity Explored: Between Public Domain and Experimental Science, 1850-1930*, ed. Staffan Müller-Wille and Christiana Brandt (Cambridge, MA: MIT Press, 2016), 189-209, 191. See also Helga Satzinger, "The Politics of Gender Concepts in Genetics and Hormone Research in Germany, 1900-1940," *Gender & History* 24, no. 3 (2012): 735-54.

Vries, as well as other biologists in de Vries's circle: the Dutch botanist, and student of de Vries, Theodoor Jan Stomps; the Canadian geneticist and eugenicist Reginald Ruggles Gates; and the American botanist and anthropologist Harley Harris Bartlett.³⁴ Campos asks whether the queer lives of these biologists were associated with their interest in the eminently queer reproductive mechanisms of *Oenothera* (specifically, evening primrose). Historians of science have previously acknowledged the dominant, heteronormative conventions, assumptions, and projections of early-twentieth-century genetics. Campos moves things on by tracking the steady conceptual and rhetorical relegation of *Oenothera* to the fringes of scientific respectability in this stiflingly straight scientific environment.

Where de Vries and his fellow queer *Oenotherologists* saw variations and opportunities, Mendelians saw incongruities and contradictions which they expressed in purposeful and loaded rhetoric—"mis-mating," "mutant," "utterly irregular," "subsexual," "degenerate," "aberrant"—that served to valorise not just their own heteronormative prejudices and projections and those organisms whose mating and reproductive strategies best matched them, but to denigrate and marginalise those that did not. Alongside his analysis of the poor primrose falling victim to early-twentieth-century scientific queerphobia, Campos gives examples of the rhetoric deployed to denote and denigrate—without fully specifying—the real or imagined queer sexualities of the biologists he looks at. For example, he quotes from a description of Gates that is replete with the kind of suggestive double-speak all too familiar to many queer people—terms like "wry smile," "twinkling eyes," "almost

³⁴ Luis Campos, "Mutant Sexuality: The Private Life of a Plant," in *Making Mutations: Objects, Practices, Contexts*, ed. by Luis Campos and Alexander von Schwerin (Berlin: Max-Planck-Institut für Wissenschaftsgeschichte, Preprint 393, 2010), 49-70.

effeminate,” “a strange man”—which serve as rhetorical nods and winks to discerning readers.

Other historians, including Michael R. Dietrich, Ina Linge, and Marsha L. Richmond, have scrutinised the incontrovertibly queer genetics of the German émigré biologist Richard Goldschmidt, originally expressed (in German) in 1911 and in numerous publications thereafter.³⁵ Goldschmidt developed a hugely influential genetic theory of sex determination and homosexuality based on experiments on *Lymantria* (gypsy moths), especially the purposeful breeding of gynandromorphs. Dietrich has further described how eugenically infused versions of Goldschmidt’s theory survived into the postwar era, especially in the work of the German psychiatrist Theo Lang, even after Goldschmidt abandoned it around 1931.

Notwithstanding these informative studies, studies of the major theories of sex determination and sex development, and their major theorists, have yet to fully recognise the breadth, popularity, and eclectic mix of actors, institutions, ideas, and texts that contributed to the burgeoning of interest in the conjoined issues of sex determination, sex development, and sexual behaviour across scientific fields and more popularly through the early- and mid-twentieth century. The subject was an ancient one, inextricably permeated with a ubiquitous and largely unquestioned desire to master the practice of wilful sex selection both in humans and non-human animals. Belief that modern science was on the brink of being able to deliver

³⁵ Ina Linge, “The Potency of the Butterfly: The Reception of Richard B. Goldschmidt’s Animal Experiments in German Sexology around 1920,” *History of the Human Sciences* 34, no. 1 (2020): 40-70; Michael R. Dietrich, “Experimenting with Sex: Four Approaches to the Genetics of Sex Reversal before 1950,” *History and Philosophy of the Life Sciences* 38, no. 1 (2016): 23-41; Michael R. Dietrich, “Of Moths and Men: Theo Lang and the Persistence of Richard Goldschmidt’s Theory of Homosexuality, 1916-1960,” *History and Philosophy of the Life Sciences* 22, no. 2 (2000): 219-47; Marsha L. Richmond, “The Cell as the Basis for Heredity, Development, and Evolution: Richard Goldschmidt’s Program of Physiological Genetics,” in *From Embryology to Evo-Devo: A History of Developmental Evolution*, ed. Manfred D. Laubichler and Jane Maienschein (Cambridge, MA: MIT Press, 2007), 169-211.

offspring of a chosen and idealised physical sex (and, by extension, sexuality) became one of the great promises of modernist biology and eugenics—a claim that was as appealing to the public at large as it was to farmers and other breeders, and which embroiled all manner of sex differences and sexualities, serving a broader eugenic vision of the biological control of human destiny.

Although, as previously stated, studies of the development of modern sexological biology have chiefly focussed on the United States and on the Continent, certain historians have provided some pertinent insights into the situation in Britain. Adele E. Clarke, for example, has recognised that a relatively discrete discipline of “reproductive” biology was forged by British biologists, especially the English zoologist Walter Heape, from around 1890 to 1910. Thereafter, the focal centre of the field shifted to the United States (although this thesis will underscore that in practice the field was international in scope). Clarke has described how the development of a new biology of sex and reproduction, involving interrelated disciplinary efforts by biologists, medical professionals, agriculturalists, birth control advocates, and philanthropic foundations, was a late development in comparison with the professionalisation of scientific fields dedicated to other major organ systems such as respiration and circulation.³⁶ The new branch of biology quickly came to be known as “reproductive” physiology, the epithet assuming general usage, especially following the publication of the leading English physiologist F. H. A. Marshall’s seminal book *The Physiology of Reproduction* (1910; 4th ed. 1984).

Fausto-Sterling briefly discusses three British authorities who were integral in establishing endocrinology as an important means of analysing and reconceptualising sex differences through the early decades of the twentieth century. As with the

³⁶ Adele E. Clarke, *Disciplining Reproduction: Modernity, American Life Sciences, and “the Problems of Sex”* (Berkeley: University of California Press, 1998), 69-74.

entirety of her study, she pays close attention to how their work was influenced by—and, in turn, influenced—the prevailing gender and sexual mores of the era. She first discusses F. H. A. Marshall, whose authorial voice in *The Physiology of Reproduction*, she states, is “dry and factual” but who was, she says, “coy” about the social dimensions of his science.³⁷ Nonetheless, Fausto-Sterling highlights Marshall’s extensive use of texts whose authors were deeply committed to influencing social gender dynamics by recourse to the new biology—the 1906 English translation of Otto Weininger’s profoundly misogynistic study, *Sex and Character*, for example, as well as other leading sexological writers of the day, including Iwan Bloch, Havelock Ellis, Auguste Forel, and Richard von Krafft-Ebing.

Secondly, Fausto-Sterling discusses Walter Heape who, in contrast to Marshall, was disturbed by the social upheavals of the day, especially the suffragette movement, the labour movement, and racial tensions. In his anti-suffragette book *Sex Antagonism* (1913), Heape presented a heavily loaded narrative which used the emerging “reproductive” physiology to argue fervently that men and women were fundamentally different and biologically equipped for divergent social roles. Interestingly, Fausto-Sterling describes how Heape acknowledged a certain measure of biological overlap between the sexes although this did not lead him to question his commitment to the notion that biology entailed differential social roles for women and men. Thirdly, Fausto-Sterling discusses the English gynaecologist William Blair-Bell, who explicitly attributed social sex differences to hormones, asserting that women’s ovaries and other endocrine organs disposed them towards “womanly” pursuits and sexual behaviours.³⁸

³⁷ Fausto-Sterling, *Sexing the Body*, 155, 156.

³⁸ Ibid., 157. See also Alice Domurat Dreger, *Hermaphrodites and the Medical Invention of Sex* (Cambridge, MA: Harvard University Press, 1998), 157-66.

Following Fausto-Sterling's analysis, several studies have added further insight into how a new sexological biology was forged within a dramatic and rapidly changing social environment in Edwardian Britain. Chiara Beccalossi has looked further at the approach adopted towards female sexual inversion by Blair-Bell.³⁹ Lisa Carstens has mapped some of the key texts by leading British biologists such as Heape and Marshall onto representations of the suffragette movement in Britain.⁴⁰ Carstens points out that Heape's *Sex Antagonism* was published precisely "as the militant suffrage campaign reached its most visible and incendiary stage".⁴¹ Importantly, Carstens emphasises how medico-scientific conceptions of "sex reversal" were facilitated by the prevailing acceptance of the principle of hermaphrodite origins. She even suggests that where scientific claims of fundamental differences between females and males were asserted, they should be viewed in the context of developing scientific concepts pertaining to sex development that destabilised traditional norms. She reaches back to the nineteenth century in order to substantiate her claim, stating that "the professor of medicine [...] Henry Maudsley may have argued in 1874 that women are women and men are men, but his need to assert it may have stemmed in part from the contrary scientific consensus already coalescing in the 1870s, that every developing fetus showed evidence of both male and female potential."⁴² The argument is an intriguing one, but has not subsequently received the further elucidation it deserves.

In her studies of the BSSSP, Hall briefly acknowledges that one of Britain's foremost biologists, F. A. E. Crew, addressed the Society in 1924.⁴³ She does not

³⁹ Beccalossi, *Female Sexual Inversion*, ch. 8.

⁴⁰ Lisa Carstens, "Unbecoming Women: Sex Reversal in the Scientific Discourse on Female Deviance in Britain, 1880-1920," *Journal of the History of Sexuality* 20, no. 1 (2011): 62-94.

⁴¹ *Ibid.*, 76.

⁴² *Ibid.*, 65.

⁴³ Hall, "Disinterested Enthusiasm," 680.

mention that he also wrote a pamphlet for the group entitled *Sexuality and Intersexuality* (1925). Elsewhere Hall refers, again briefly, to another prominent British biologist, Julian Huxley, whose experiments on rejuvenation and a 1922 lecture on “Reversing the Sexes” prompted various individuals to write to him for sex advice.⁴⁴ What were Crew’s and Huxley’s interest in sexology? One could reasonably infer that, as fellow eugenicists, they welcomed engagement with the kind of social issues that members of the BSSSP concerned themselves with. There is, however, simply more to it than that. Both Crew and Huxley, and other leading British biologists, were deeply involved with research programmes and writings relating to the biology of sex determination and development, studies that centred on non-human animal subjects exhibiting intersexualities, sex metamorphoses, and non-heteronormative sexual behaviours. This thesis looks into those programmes in detail.

Importantly, Crew and Huxley not only pursued major sexological research programmes but promoted the new biology of sex widely in popular and semi-popular books and periodicals and in Britain’s newspapers, thereby achieving much broader and greater impact in British society than Ellis or any of the sex reformers associated with the BSSSP. Scrutinising this hugely important aspect of the development of modern sexological biology in Britain constitutes a key contribution of this thesis. Developing Laura Doan’s association of the history of sexology with studies of science popularisation, the following thesis presents a new model by which to conceptualise the production and dissemination of sexological knowledge, and popular science more generally, which I term the *adaptationist model of science popularisation*.

⁴⁴ Hall, *Sex, Gender*, 95.

I propose this model to reflect not just the dynamic movements and translations of scientific knowledge between scientists and audiences but also how scientific ideas, rhetoric, and practices are modified to different ends, appended, distorted, repudiated, censored, or otherwise changed through the varied processes of dissemination. The promotion of eugenics and sex selection, which saturates the popular writings of leading biologists through the early- and mid-twentieth century but is little mentioned in specialist scientific contexts, is a prime case in point. This thesis demonstrates that leading communicators of science and eugenics—Crew and Huxley are good examples—used different specialist, semi-popular, and popular platforms for different purposes, very often harnessing popular platforms to achieve personal and ideological agendas that specialist, professional platforms did not facilitate. By presenting a dynamic model of the popularisation of sexological knowledge—a model that accommodates the transformations, modifications, and abuses of sexological knowledge as it is disseminated between scientists and their audiences—the thesis presents a model of popular science and eugenics that has much broader application in science historiography.

In short, this thesis attempts a major development of Clarke's, Fausto-Sterling's, and Carstens's formative studies of the pursuit of sexological biology in Edwardian Britain. It also further expands the tantalisingly suggestive remarks of Allen, Richardson, and Satzinger, which signalled the queer origins of classical genetics and looks closely at the sexological biology of Huxley, Crew, and other biologists and eugenicists through the interwar period. The thesis does not, however, lose sight of other important aspects of modern British sexology, including Havelock Ellis's sexological works and the activities of the BSSSP. Adopting as broad an approach as possible, it works to bring the various elements of modern British

sexology that historians have previously discussed separately into much clearer juxtaposition. In doing so, it develops Carstens's important observation that queerphobic models of sex differences and sexualities have often been developed in a close, symbiotic relationship with moves towards the naturalisation and normalisation of queer bodies, minds, and behaviours. By adopting a multidimensional approach—examining the role of biology and biologists in shaping sexual knowledge through the Edwardian and interwar eras, including the transmission of biological concepts of sexualities across specialist and popular written genres—this thesis makes original and pertinent contributions to science history that are also relevant to several other historiographical fields; fields including the history of medicine, gender history, queer history, the history of ideas, the history of eugenics, and modern British studies.

Methodology and Sources

The advent of queer theory and queer history have much to offer science historiography, and vice versa. At its most basic definition, 'queer' refers to gender and sexual identities beyond the binary constructs of female and male and heterosexual and homosexual. In recent years, however, queer has come to define a range of critical and methodological approaches towards conceptualising genders and sexualities. Queer approaches invite historians to explore the ever-shifting dynamics of sex, gender, and sexualities in all their expressions in historical contexts, as well as providing a means of contextualising and scrutinising today's categories and debates. Reflecting the profound influence of a generation of feminist and queer

history writing, most historians of feminist and queer histories today recognise the historical contingency of different concepts and rhetoric relating to sex, gender, and sexualities in our own time and past temporal and geographical contexts. In other academic arenas, and in society more generally, attitudes can be markedly divergent, with many people reluctant to understand familiar categories such as ‘female’ and ‘male’ and ‘heterosexuality’ and ‘homosexuality’ as anything other than transhistorical realities.

Queer approaches to historiography are still relatively new and continue to evolve. Pioneering queer histories such as Matt Houlbrook’s *Queer London: Perils and Pleasures in the Sexual Metropolis, 1918-1957* (2005) and Laura Doan’s *Disturbing Practices: History, Sexuality, and Women’s Experience of Modern War* (2013), as well as progressive studies emanating from intersex and transgender studies, have worked to include a diversity of bodies, minds, and behaviours, and to scrutinise the shifting categories that have been used at different times to refer to them, in queer historiography.⁴⁵ This thesis embraces this approach, identifying hitherto unrecognised or under-researched ways in which sex, gender, sexualities, and sexual behaviours, including different concepts of homoeroticism, were considered in Britain and elsewhere through the early and middle decades of the twentieth century. Indeed, it underscores the high degree to which biologists of the period and many of their interlocutors considered *all* higher animals, including humans, to be dual-sexed to a certain degree and potentially capable of sex metamorphoses— notions that were solidly founded in Darwinian biology. This widely held and hugely influential attitude towards science history, and its

⁴⁵ Matt Houlbrook, *Queer London: Perils and Pleasures in the Sexual Metropolis, 1918-1957* (Chicago: University of Chicago Press, 2005); Laura Doan, *Disturbing Practices: History, Sexuality, and Women’s Experience of Modern War* (Chicago: University of Chicago Press, 2013).

development during the twentieth century, deserves much greater scholastic recognition than it has hitherto received.

In his study of Hugo de Vries and other Oenotherologists, Luis Campos considers how queer perspectives might better enrich science historiography. Historians, he writes, have paid a great deal of attention to the central importance afforded to homosocial environments and the general exclusion of women in the formation of modern science. He further states that “homosexuality” as a historical concept and form of emergent biopolitics (“an epistemic thing with a particular historical trajectory and construction all its own”) has also been studied.⁴⁶ Astutely recognising that the figure of the “(confirmed) bachelor” appears with curious frequency in the history of science, Campos suggests that sexuality, or—rather—what he provocatively terms “the mutant gaze”, should be considered as “a new analytic tool for doing science historiography”.⁴⁷ He derives the ghastly appellation “mutant gaze” from the study of mutation in early-twentieth-century genetics generally and the “queer” mode of reproduction in *Oenothera* (“one queer plant” according to Campos) more particularly, which are his chief objects of analysis.⁴⁸ He argues that while the “mutant gaze” of the biologists he studies is evident, its recognition and elucidation was largely missing from science historiography. Historians, most notably Londa Schiebinger, had long shown how scientists considered and described the sexual reproduction (or “private lives”) of plants in heteronormative terms. *Oenothera*, however, was a plant that defied such conventions, a situation that ultimately sealed its fate as a tolerable research plant among the first modern geneticists, despite its extraordinary, mutant reproductive

⁴⁶ Campos, “Mutant Sexuality,” 53.

⁴⁷ Ibid., 49.

⁴⁸ Ibid., 50.

habits finding favour with de Vries and the other biologists Campos looks at.

Campos writes:

The question is therefore something of an epistemic challenge for the historian: is there a way in which using sexuality as an analytic lens can help us understand something of the dynamics of these discursive twists and turns in Oenotherology? Is there more to the mutant gaze than meets the eye?⁴⁹

Paying more attention to the private life of *Oenothera*, Campos argues, not only helps provide a more accurate understanding of the evolutionary and ecological history of mutation but “may also make possible a rich new ‘queer’ reading for historians of genetics.”⁵⁰ He continues:

Drawing on feminist scholarship in our field, and the insights into the role of gender in genetics, I want to suggest that sexuality and sexual orientation can be more for the history of science than an *object* of study; just like sex and gender, sexuality and sexual orientation can be fruitfully used as *tools of analysis* in understanding the construction of scientific knowledge.⁵¹

This thesis chiefly provides a discourse analysis relating to how concepts and practices of sex differences and sexualities have been made, dismantled, and remade in different medico-scientific contexts (i.e., queer bodies and sexualities as objects of study). It does not therefore develop Campos’s vision of sexuality as a tool of analysis in science historiography in all of the ways he suggests, primarily because, for most of the biologists I look at, there is very little extant information about their sexualities to go on. In and of itself, that lack of information suggests a problem with Campos’s analysis. He was fortunate to have found pertinent private papers relating to de Vries, aptly locked away in a closet in Amsterdam, and these form the basis of

⁴⁹ Ibid., 52.

⁵⁰ Ibid.

⁵¹ Ibid. Campos’s italics.

his study on the queer Oenotherologists. Hopefully, as the queer instincts of historians of science become more finely honed and the closets of more scientists are more thoroughly researched, further such sources will be found. In the meantime, it must be recognised that, as innumerable examples attest, bachelorhood, marriage, and parenthood are suggestive but unreliable indicators of an individual's sexuality and that most people in past ages did not produce documentary evidence of their private lives, queer or otherwise.

Moreover, while I fully accept that the private lives of scientists are inextricably associated with their science, I am less than convinced that a methodological formula that might enable historians to chart the fascinating transmission between the sex lives of scientists and their science can so readily be founded upon a simple straight-gay dichotomy—precisely that which queer theorists have queried. Campos appears to limit his notion of a “mutant gaze” to the “mutant gays” (his term) that he discusses in his article, de Vries chief among them.⁵² Elsewhere in his article Campos refers to “homosexual scientists”.⁵³ I want to suggest that the situation can be further problematised and that a scientific “queer gaze” (as I prefer) is more complex and ubiquitous than Campos allows for, at least potentially so. That gaze is impacted by the degree to which it is variously censored and expressed by any scientist or group of scientists within specific social and historical contexts, and such censorship and expression requires concerted analysis. A broader methodological approach is needed—one that embraces Campos's vision of sexuality-infused science but which allows for at least some (queer) scientific creativity and enlightened social activism on the part of all scientists (and therefore

⁵² Ibid.

⁵³ Ibid., 53.

eschewing a position, arguably implicit in Campos's study, that straight scientists can only produce straight/heteronormative science).

By more consciously acknowledging the critical importance of hegemonic sexual and gender prejudices in shaping the gazes and practices of all scientists, the problem of matching certain scientific outcomes to something embedded essentially in a scientist's sexuality is mitigated. One need only consider that Charles Darwin—whose personal commitment to hegemonic Victorian gender and sexual mores was unassailable—not only wrote about the queer sex lives of flowers a generation prior to de Vries, but also wrote about them approvingly queerly. For example, of the remarkable private lives of orchids, he remarked: “Who would have been bold enough to surmise that the propagation of a species should have depended on so complex, so apparently artificial, and yet so admirable an arrangement?”⁵⁴ Darwin's scientific gaze was therefore proficiently queer when he allowed it to be (indeed, so queer are Darwin's botanical studies that they are even referred to in Karl Heinrich Ulrichs's 1868 homophile polemic *Memnon*).⁵⁵ Clearly, however, its queerness was suppressed, suspended, or otherwise overcome when he was faced with the multitude of intersexualities, transformations of sex, and non-repronormative sexual behaviours that are ubiquitous in the animal kingdom but which, in humans, were subject to long-standing religious, legal, medico-scientific, and cultural strictures that were deeply embedded in the Victorian psyche. Victorian sexism, which too easily transmuted into twentieth-century sexism, and modern scientific racism, have long been analysed as important shaping influences in scientific communities by

⁵⁴ Charles Darwin, “On the Three Remarkable Sexual Forms of *Catasetum tridentatum*, an Orchid in the Possession of the Linnean Society,” *Proceedings of the Linnean Society of London. Botany*. 6 (1862): 151-57, 157.

⁵⁵ Karl Heinrich Ulrichs, *The Riddle of “Man-Manly” Love: The Pioneering Work on Male Homosexuality*, trans. Michael A. Lombardi-Nash, 2 vols (New York: Prometheus Books, [1864-1880] 1994), 2: 390.

historians of science. However, the malignant influence of modern scientific queerphobia, and internalised queerphobia, has yet to be explicitly and comprehensively investigated.

In this thesis I pay close attention to the ways in which the production and application of modern scientific queerphobia mediated the nebulous space between the often-queer gaze of scientists and the queerphobic cultural environment within which they lived and worked. A revelation of this thesis is that certain (seemingly straight) biologists often believed that sex variations, including sexual inversion/homosexuality, had naturally evolved. They did not construe such variations as pathological (there were, of course, others who did). Nonetheless, such positioning was sometimes twisted by a profoundly patriarchal and queerphobic environment, and thereby given a heteronormative bent, often by recourse to eugenics and a broader cultural mentality that sought to subjugate human lives and “improve” human bodies, minds, and behaviours for the perceived needs of a nation, empire, or “civilisation”, invariably construed by elite patriarchs and colonialists in their own, idealised image. By considering this in close juxtaposition to the sexually-suffused gazes of scientists, I believe it is possible to apply Campos’s vision of a queerer science historiography beyond the confines of histories of botanical genetics, and as ubiquitously as extant sources allow.

Although most of this thesis examines the concepts and practices of biologists without recourse to an analysis of their sexualities, I do consider the case of one biologist, Julian Huxley, in more personal terms. Huxley’s deep interest in sexological biology played out in multiple ways in twentieth-century Britain. Some interesting archive finds, along with some pointed remarks in the first volume of his autobiography, *Memories* (1970)—read in conjunction with the trajectory of his

published sexological writings—make him an ideal case study for charting how a scientist’s private life shapes their science. My approach to Huxley is therefore more biographical than is the case for the other biologists I discuss in this thesis. To be clear, I do not out Huxley as Campos outs de Vries. My purpose here is to demonstrate that Huxley’s complex and troubled private life was reflected in his science and therefore that Campos’s vision of sexuality as an analytical tool in science historiography works out in diverse cases and for sexualities in all their complexities.

In addition to ‘queer’, another term that I use in this thesis is ‘modernism’ (and its cognates). In his series editor preamble to the pioneering *Modernism and . . .* monographs, Roger Griffin usefully states that modernism “embraces the vast profusion of creative acts, reforming initiatives, and utopian projects that, since the late nineteenth century, have sought either to articulate, and so symbolically transcend, the spiritual malaise or decadence of modernity, or to find a radical solution to it through a movement of spiritual, social, political – even racial – regeneration and renewal.”⁵⁶ In the first book of the *Modernism and . . .* series, *Modernism and Eugenics* (2010), Marius Turda has deftly shown how such a broad but dynamic definition of modernism that includes, but reaches beyond, the creative arts can inform and invigorate historiographical investigation. He demonstrates how eugenics intersected with diverse modernist political and social ideologies—nationalism, liberalism, social democracy, anarchism, communism, and fascism—assuming diverse intellectual and political expressions across a wide geographical spread. This thesis echoes Griffin’s and Turda’s expansive approach to modernism, working to establish more firmly the importance of new biologies of sex that

⁵⁶ Marius Turda, *Modernism and Eugenics* (Basingstoke: Palgrave Macmillan, 2010), [i].

emerged from around 1900 as an integral part of broader modernist movements that shaped twentieth-century Britain, including the snowballing explanatory power of the biological sciences and eugenics. Today, literary theorists eagerly speak of *queer modernism*, but the term has yet to be so readily embraced in broader historiographical contexts.⁵⁷ This thesis therefore considers the critical importance of biology and biologists in shaping sexual knowledge and practices which, to many moderns in Britain, including many biologists, were considered in multiple, often queer or non-binary, terms.

In order to scrutinise the emergence and development of new biologies of sex following major discoveries in endocrinology and genetics around 1900, and their steady dissemination and influence in modern Britain, the thesis draws upon a wide variety of primary sources. Some of these are well known to historiography, but have received little attention for their queerer aspects, while others are identified and explored here for the first time. They can be grouped under four general headings: elite and specialist scientific articles and books; popular and semi-popular publications written by biologists; newspaper articles; and archival sources (by semi-popular I refer to professional publications such as *Nature* and the *Lancet*). Pertinent personal and institutional archives have been used to pull together the various components of what is a complex network of scientists, institutions, ideas and cultural processes.

Special attention is paid to two genres of writing that have proven particularly useful in charting the dissemination of sexological concepts and rhetoric in modern Britain. Firstly, the thesis uses published correspondence in leading periodicals—

⁵⁷ See, for example, Benjamin Kahan, “Queer Modernism,” in *A Handbook of Modernism Studies*, ed. Jean-Michel Rabaté (Chichester: Wiley-Blackwell, 2013), 343-58; Robert L. Caserio, “Queer Modernism,” in *The Oxford Handbook of Modernisms*, ed. Peter Brooker, Andrzej Gasiorek, Deborah Longworth, and Andrew Thacker (Oxford: Oxford University Press, 2010), 199-217.

sources which are, generally speaking, surprisingly neglected in scholarship and yet which provide invaluable insights into pertinent issues pertaining to changing sexual mores that were considered important to people at particular points in time and which are not afforded by any other sources. Letters to editors are often forthright, sometimes even venomous, and often demonstrate how certain sexological studies and ideas were contested. Chapter four of the thesis therefore includes several examples of how published correspondence helps historians put together a multidimensional picture of pertinent events in the hope that such abundant sources will be given greater attention in scholarship more broadly.

The thesis also makes extensive use of newspaper articles relating to scientific studies of sex that were published in Britain's newspapers through the early decades of the twentieth century. The reporting of medical and scientific studies of sex-related subjects is an especially interesting area for historians, providing a useful barometer of sexual mores at any given time and providing some indication of the reach and reception of particular sexological issues. Inspiration for closely examining the critical role played by newspaper reporting in the dissemination of sexological knowledge in modern Britain has come from the studies of Alison Oram and Clare Tebbutt, outlined above, on "sex change"/"gender-crossing" in 1930s Britain.⁵⁸ Tebbutt begins her thesis with an article from the *News Chronicle* dated January 1, 1932, titled "Sex Determination: Discovery by London Doctors: Strange Case of a Girl-Boy", which concerns an unnamed person who had been certified as a girl at birth, developed as a boy, and was about to be officially registered as male aged fourteen on the advice of a "high medical authority" at Charing Cross Hospital,

⁵⁸ In his study of science popularisation in early-twentieth-century Britain, Peter Bowler has provided a useful overview of popular science reporting in Britain's newspapers through the period. Peter J. Bowler, *Science for All: The Popularization of Science in Early Twentieth-Century Britain* (Chicago: University of Chicago Press, 2009), 196-209.

almost certainly Lennox Broster.⁵⁹ Interestingly, Tebbutt mentions in passing that the report makes reference to sex changes in non-human animals. The *News Chronicle* article reads:

These changes are rare in the human race, but quite common among certain animals. The most common case is the hen, which changes into a cockerel. The change is frequent in pigs. It occurs sometimes in cattle, but very rarely in horses.⁶⁰

In this thesis I build on Tebbutt's and Oram's studies by identifying a sizeable body of newspaper reporting relating to scientific studies of transformations of sex in non-human animals, especially fowl, that emerged in 1913/14 and multiplied with the sexological pursuits of Crew and Huxley through the 1920s. These reports prefigure those relating to human sex change/gender crossing and go a considerable way towards explaining why biological sex was so readily accepted as mutable both in specialist medico-scientific and popular contexts in 1930s Britain.

Chapterisation

Chapters one and two cover the Edwardian era. They work chronologically, the first chapter looking at the period from around 1900 to 1910 and the second chapter taking in the period 1910 to 1915. Together, the third and fourth chapters cover the whole of the interwar period, with chapter three charting the development of sexological biology more generally and chapter four dealing specifically with the subject of homosexuality.

⁵⁹ Tebbutt, "Popular and Medical Understandings," 10.

⁶⁰ Ibid.

In detail, the first chapter charts different genres of sexological writing from 1898—when the scientific study of sex determination sensationally emerged as an object of media interest in Britain—to the publication of Marshall’s *The Physiology of Reproduction* in 1910. Beginning with a survey of the sexological enterprises of Peter Chalmers Mitchell, secretary of the Zoological Society of London, this chapter explores a variety of texts, paying especially close attention to the profound influence of the English translation of Otto Weininger’s *Geschlecht und Charakter*. Published as *Sex and Character* in 1906, the English version of the book prompted the publication of a raft of other sexological texts, mainly English translations of other continental works. It was against this vibrant sexological backdrop that new biological models of sex determination and sex development derived from revolutionary discoveries in genetics and endocrinology emerged and were shaped in relation to each other. To a significant extent, this new sexological biology evolved through the scrutiny of unusual, and socially reviled, bodies, minds, and behaviours—human and non-human—especially intersexualities, sex metamorphoses, and non-heteronormative sexual behaviours. Both genetics and endocrinology engendered new genres of sexological writing in Britain and elsewhere. Whether specialist or popular, such writing foregrounded sex variations and brought the new biology of sex into close juxtaposition with major sexological authors such as Havelock Ellis and Otto Weininger.

The second chapter explores the growing hegemony and popularisation of the new sexological biology in Britain through the late-Edwardian era (1910-15), a critical period in the history of British sexology when the medico-scientific establishment fully shed its earlier prudishness and standoffishness towards the scientific study of sex, especially sex variations. It spotlights Magnus Hirschfeld’s

1913 visit to London for the seventeenth International Congress of Medicine for which he curated an exhibition on “Sexual Transitions.” It also examines the development of a concerted research programme, chiefly focussed on sex transformation in fowl, among certain leading British biologists which, in several ways, emulated Hirschfeld’s sexological paradigm but without his liberationist agenda. In July 1914, an extraordinary report on “Transformation of Sex” published in *The Times* brought such studies to widespread attention, establishing an interest in sex changes, human and non-human, that continued to feature regularly in Britain’s newspapers thereafter. For his part, Havelock Ellis incorporated key tenets of endocrinology in the third and final edition of *Sexual Inversion*, published in the United States in 1915. The work, however, had little discernible impact in Britain where leading proponents of the new genetics developed new, idiosyncratic models of same-sex sexual behaviour in Mendelian terms, with ever-diminishing reference to sexologists such as Ellis. The chapter moves on to outline how sexological biology came to be embroiled with eugenics in complex, often nebulous, ways—ways that worked to mitigate the potential for naturalising and normalising sex anatomies, psychologies, and behaviours that remained heavily proscribed socially and legally. It also identifies the sexological contexts behind calls for reform of the law relating to gay sex, while recognising that these remained rare through the late-Edwardian era.

Following his early studies on avian courtship and initial analysis of sexual selection, the young Julian Huxley turned his attentions to the new ‘reproductive’ biology that was rapidly gaining ground in Europe and, at an astonishingly rapid pace, in the United States where Huxley worked for a time. His influential sexology is scrutinised in the third chapter of this thesis. It was largely due to his interest in the

subject that modernist sexology finally broke through into mainstream intellectual and popular discourse in Britain. From the early 1920s, Huxley's pronouncements on sex questions, especially his view that scientists were on the verge of controlling sex-determining mechanisms in humans, were widely reported and debated in the medical press, in intellectual and popular periodicals, and in Britain's newspapers. Huxley's interest in sexological biology and its rampant popularisation was echoed by F. A. E. Crew whose laboratory experiments on intersexualities and sex transformations formed a major part of the research programme at the newly founded Animal Breeding Research Department (now Institute of Animal Genetics) at the University of Edinburgh. The chapter examines the reasons why Crew pursued this research, seeking—in particular—to delineate important relationships between reproductive science, agricultural concerns, and eugenics.

Burgeoning interest in sexological biology impacted on appraisals of sexualities in various ways through the interwar era, prompting calls for eugenic prevention and biological therapies for homosexuality in Britain, as well as calls for decriminalisation made by individual medical professionals and scientists. The fourth chapter scrutinises a spat on the issue of decriminalisation, prompted by a lecture delivered by Huxley, which appeared in the correspondence pages of the *British Medical Journal* in the spring of 1922. The clash of mores, traditional and progressive, that is evident in this discourse would come to define subsequent debates on homosexual law reform, not least those which proliferated from within medico-scientific disciplines.

The chapter also examines the early sexological works of Kenneth Walker, who maintained a prominent presence in the homosexuality debates that raged so intensely through the mid twentieth century. The chapter reveals, for the first time in

scholarship, that Walker surgically castrated a homosexual man with the express intent of curtailing his homosexual desires. The chapter concludes by looking at how different notions of the heritability of homosexuality were disseminated in interwar Britain, some drawn from homophile sources (such as Magnus Hirschfeld), others from Nazi eugenicists. These notions were largely perpetuated in popular and semi-popular publications and had little solid grounding in academic science. The various sexological ideas and practices relating to homosexuality discussed in this, the final chapter of the thesis, did much to lay the groundwork for an intensification of public and professional debates about homosexuality that arose so dramatically in Britain after 1945.

1. Emerging Biologies of Sex, 1898-1910

Treasure your exceptions! When there are none, the work gets so dull that no one cares to carry it further. Keep them always uncovered and in sight. Exceptions are like the rough brickwork of a growing building which tells that there is more to come and shows where the next construction is to be.

—William Bateson (1908)¹

The text that finally broke the British medico-scientific profession's standoffish attitude to the new sexology which had proliferated so spectacularly on the Continent and in the United States through the late-Victorian era, was not any of the volumes of Havelock Ellis's *Studies in the Psychology of Sex* but rather the 1906 English translation of *Geschlecht und Charakter*, by the obscure, troubled Austrian philosopher Otto Weininger. Originally published in German just a short time before Weininger killed himself (in October 1903), *Sex and Character* was anonymously translated into English, and put out by William Heinemann in London and G. P. Putnam's Sons in New York. The book was one of the first sexological text to be reviewed in Britain's leading science journal, *Nature*, and became a go to text for British biologists as they grappled with new ways of conceptualising the biology of sex determination, sex development, and sexualities in all their diverse manifestations. The chapter ahead explores these important intertextual dynamics and the earliest stages of the emergence of new biologies of sex, from the turn of the twentieth century to the publication of F. H. A. Marshall's seminal text *The Physiology of Reproduction* in 1910. It scrutinises the vexed but increasingly close

¹ William Bateson, *The Methods and Scope of Genetics: An Inaugural Lecture Delivered 23 October 1908* (Cambridge: University Press, 1908), 22.

associations between sexological biology with major works by leading sexologists and their interlocutors that were circulating in Edwardian Britain and elsewhere, with a particular focus on *Sex and Character*.

The rediscovery of Gregor Mendel's laws of inheritance around 1900 and the almost simultaneous identification of "sex" (X and Y) chromosomes and "internal secretions" (hormones) were revolutionary but also intensely puzzling. Prevailing sexological concepts and practices developed over the course of the nineteenth century, not least through the work of Charles Darwin. Notions such as primordial hermaphroditism (dual-sexed origins) and latent sex, proved especially useful in filling vast epistemological gaps but also brought the new biologies of sex into ever closer juxtaposition with the contentious sexologies of Havelock Ellis, Magnus Hirschfeld, Otto Weininger, and other leading sexological writers.

The first section of this chapter begins the process of demonstrating how leading biologists reconfigured the sexological terrain in Britain through the early years of the twentieth century by looking at the eclectic sexological activities of the prominent Scottish biologist Peter Chalmers Mitchell, a key figure in Edwardian science but one who has not previously been considered in relation to the development of sexology through the era. While his own laboratory studies on sex determination were negligible, Mitchell's occasional engagement with sex-related subjects not only straddled medico-scientific genres but also played a significant role in popularising certain sexological texts, not least Weininger's *Sex and Character*. In this respect Mitchell is symbolic of shifts that began to redefine the pursuit of sexology through the Edwardian era. By appreciating the early involvement of British biologists such as Mitchell with the pursuit of sexology, the transition from

late-Victorian sexology to the hegemony of genetics and endocrinology as the main arbiters of sexual knowledge in modern Britain is more readily understandable.

The second and third sections of the chapter each consider how major new discoveries in genetics and endocrinology first impacted on medico-scientific concepts of sex, highlighting how observations and concepts of hermaphroditism and other sex variations, including transformations of sex and non-reproductive sexual behaviours and sexualities, were pivotal in establishing a new sexological biology in Edwardian Britain and elsewhere. The second section explores the rediscovery of Mendel's laws of inheritance and the emergence of genetics while the following section explores the early development of endocrinology. Both fields, genetics and endocrinology, co-developed rapidly through the 1900s and 1910s in Britain, the United States, on the Continent, and elsewhere, but without necessarily producing answers to key questions relating to sex determination, sex development, sex differences, sexualities, and sexual behaviour. Whether or not the exceptions of sex were "treasured" in the way that pioneering English geneticist William Bateson, quoted above, recommended that the exceptions of scientific endeavour should generally be regarded, they were—for the most part—kept "uncovered and in sight", and provided a large amount of the basic raw material out of which a new, modernist sexological biology was born.

Peter Chalmers Mitchell on the Variations of Sex

Through the late-nineteenth- and early-twentieth centuries a voluminous body of literature was produced on sex determination by a diverse range of writers applying a

wide variety of theories, old and new. Writing in 1907, the influential English biologist Walter Heape remarked that the subject had long excited great interest among animal breeders and that he was aware of over six hundred books and papers which promulgated numerous theories about the determination of sex and methods for regulating the sex ratio.² The prolific literature on sex determination traverses academic and popular genres with books, articles, reviews, and correspondence on the subject frequently published in the medical press, in popular science journals, and in leading intellectual journals (such as the *Eugenics Review*).

The best-known book on the subject of sex determination around the turn of the twentieth century was undoubtedly *Einfluss auf das Geschlechtsverhältnis* (1898) by the Austrian embryologist, and director of the Embryological Institute in Vienna, Samuel Leopold Schenk. Tatjana Buklijas has discussed Schenk's book and the sensation surrounding its publication in the German-speaking world.³ Accused of bad science and inappropriate self-promotion, Schenk was forced into early retirement by the authorities at the Vienna Medical Association and the University of Vienna. The book's reception in Britain, which is not discussed by Buklijas, was no less sensational. It was published in English as *Schenk's Theory: The Determination of Sex* (1898) by the Werner Company. It was nearly published by William Heinemann, who was approached by Schenk's Viennese publisher about the English publishing rights. Without divulging the theory, the Viennese publisher managed to convince Heinemann that Schenk had not only discovered the secret of sex determination but had developed a sure-fire way of ensuring the birth of a son by a simple treatment. Heinemann wisely sought some expert advice and called upon his friend and

² Walter Heape, "Notes on the Proportion of the Sexes in Dogs," *Proceedings of the Cambridge Philosophical Society* 14 (1907): 121-51, 121.

³ Tatjana Buklijas, "Publicity, Politics, and Professoriate in fin-de-siècle Vienna: The Misconduct of the Embryologist Samuel Leopold Schenk," *History of Science* 58, no. 4 (2020): 458-84.

collaborator Peter Chalmers Mitchell, the eminent Scottish biologist and secretary of the Zoological Society of London, to proffer an opinion about the validity of such sensational claims. In his 1937 memoir *My Fill of Days*, Mitchell recalls his “amusing adventure” as he was dispatched by Heinemann (who was, Mitchell wrote, “bubbling over with commercial excitement and natural curiosity”) to a hotel in Brussels to meet with the Viennese publisher under conditions of utmost secrecy in order to ascertain whether Schenk’s great secret really did resolve centuries of speculation.⁴ Mitchell knew the existing scientific literature on sex determination well and had even carried out some of his own experiments in which he gave differential diets to tadpoles to test if this affected the development of sex, but with inconclusive results.

Watched carefully by Schenk’s Viennese publisher lest he attempt to make any notes, Mitchell had half an hour to read the manuscript, but he quickly objected to its contents. Schenk’s theory rested on the presumption that sex was determined by degrees of nourishment, which was not at all original. His particular take, which Schenk claimed could only be used to procure the birth of a son, involved measuring the quantity of sugar in the urine of a would-be mother and only permitting impregnation if no sugar was present. Mitchell considered the empirical evidence for the theory to be insignificant and recommended that Heinemann decline to publish. Heinemann was disappointed but subsequent events would absolve him of any regrets.

The rampant sensationalism and self-promotion that Schenk and his Viennese publisher spun around the theory was astonishingly successful in other quarters, not least in catapulting Schenk and his book into newspaper headlines across the world.

⁴ Peter Chalmers Mitchell, *My Fill of Days* (London: Faber and Faber, 1937), 119.

The *Daily Chronicle* (January 5, 1898) broke the story in Britain under the headline “The Sex Secret: Reported Sensational Discovery”. The story was subsequently picked up by several British national and local newspapers as well as the *New York Times* and other international newspapers.⁵ Schenk’s claim to have discovered a means of wilfully controlling the sex of offspring was a sensation and was the first modern news event concerning a story that might reasonably be considered sexological (to be clear, newspaper stories about Schenk’s alleged discovery occurred a few months prior to the prosecution of a London bookseller which resulted in the banning of *Sexual Inversion* in Britain, perhaps even paving the way for the latter’s widespread media coverage).

Mitchell considered the media furore around Schenk’s book to be a singular example of one of the newspaper world’s “periodical scientific excitements”.⁶ Writing for the *Saturday Review* (January 15, 1898) he remarked: “Stop-press telegrams relating to flying squadrons in the Far East or to the latest vagaries of the Imperial William have been jostled by dispatches from the Embryological Institute at Vienna, and Professor Schenk is well on the way to be regarded as the inventor of sex itself.”⁷ Mitchell’s view, however, remained resolute. Based on an interview with Schenk that appeared in the *Daily Chronicle* (January 13, 1898), he bluntly declared, “Professor Schenk is in this matter a grotesque charlatan.”⁸ Schenk continued to

⁵ “The Sex Secret: Reported Sensational Discovery,” *Daily Chronicle*, January 5, 1898, 7. Among dozens of subsequent reports, see, for example, “The Sex Secret: Views of German Professor,” *Daily Chronicle*, January 7, 1898, 5; “The Secret of Sex: Interview with Dr. Schenk,” *Daily Chronicle*, January 13, 1898, 8; “Schenk’s Theory of Sex,” *Evening Telegraph*, August 3, 1898, 2. A further round of newspaper stories circulated in January 1900 after Schenk was compelled to step down from his position at the Embryological Institute. See, for example, “The Sex Problem: Professor Schenk Compelled to Resign,” *Sheffield Evening Telegraph*, January 5, 1900, 3; “Professor Schenk’s Theory,” *Standard*, January 5, 1900, 3.

⁶ Peter Chalmers Mitchell, “The Determination of Sex,” *Saturday Review*, January 15, 1898, 71-72, 71.

⁷ *Ibid.*

⁸ *Ibid.*, 72.

promote his theory even after his exit from the Embryological Institute but was never able to convince other scientists of its viability. For example, at the Zoological Congress in Berlin in August 1901, the British evolutionary biologist Edward Bagnall Poulton denounced Schenk's theory and pointed out the dangers of his dietary system.⁹ The theory was largely forgotten after Schenk died in August 1902 but, importantly—following the prolonged media coverage that he had provoked—Britain's newspapers continued to publish occasional articles on fashionable sex determination theories, establishing medico-scientific studies of sex determination and the promise of its control as ongoing concerns of the British press.¹⁰

Although he had curtailed Heinemann's enthusiasm for Schenk, Mitchell's activities also continued on interesting fronts. He translated works (for G. P. Putnam's Sons) by the eminent Paris-based Russian zoologist and pioneering immunologist Élie Metchnikoff. Beyond the academic history of science and medicine, Metchnikoff's name has failed to endure, but he was immensely popular in his day, not least among certain of Britain's leading biologists. Clearly more impressed with their contents than he had been with Schenk's book, Mitchell translated two of Metchnikoff's later philosophical works into English: *Études sur la nature humaine: Essai de philosophie optimiste* (1903), published in Britain and the United States as *The Nature of Man: Studies in Optimistic Philosophy* (1903; revised edition issued in 1938), and a work that was only published in English, *The Prolongation of Life: Optimistic Studies* (1908).¹¹ In these books Metchnikoff

⁹ See, for example, "Lesson from the Silkworm," *Daily Mail*, August 16, 1901, 5; "Professor Schenk and His Sex Theory," *Sheffield Daily Telegraph*, August 16, 1901, 5.

¹⁰ See, for example, "The Problems of Sex," *Edinburgh Evening News*, July 2, 1901, 2; "Determination of Sex," *Daily Mail*, September 22, 1904, 5; A. C. Fox-Davies, "Sex and Heredity: A New Theory," *Daily Mail*, September 29, 1905, 4.

¹¹ Élie Metchnikoff, *The Nature of Man: Studies in Optimistic Philosophy*, ed. Peter Chalmers Mitchell (New York and London: G. P. Putnam's Sons, 1903). Two French editions of the work were published in 1903, the second including responses to criticisms that the first had evoked. Mitchell's

promoted a grand modernist vision of biology as a preferable recourse to meaningful optimism than religion or philosophy, thereby significantly expanding the fields of endeavour with which he thought biologists should concern themselves.

The Nature of Man is particularly noteworthy from the sexological perspective. Its deft conceptual and rhetorical manoeuvring accommodated sex-variant bodies, minds, and behaviours long considered immoral and unnatural within an expansive and idiosyncratic evolutionary narrative while maintaining their long-standing inferior and pejorative connotations. Darwin had done as much in *Descent*, albeit with minimal elucidation, and late-Victorian degeneration theorists had worked at great length to re-cast sex variations as evolutionary throwbacks. Metchnikoff's unique attempt to reframe reviled biological and psychological phenomena within Darwinian biology, and early-twentieth-century bourgeois society, without recourse to degeneracy theory, is especially worthy of historians' attention for it had an influence on British biologists, especially Geoffrey Smith and Julian Huxley, both discussed later in this thesis (Huxley succeeded Mitchell as secretary of the Zoological Society of London in 1935). It is also perhaps significant that all three biologists—Mitchell, Smith, and Huxley—were Oxford men, indicating a specific intellectual genealogy. For Smith and Huxley, in particular, *The Nature of Man* proved useful in contextualising new developments in genetics and endocrinology within a broad evolutionary narrative. The text can therefore be regarded as an important bridge between late-Victorian Darwinism and early-twentieth-century sexological biology.

In *The Nature of Man* Metchnikoff argued fervently that “evil” was a biological problem that demanded more concerted responses by biologists in order to

English version is made from the first French edition. Élie Metchnikoff, *The Prolongation of Life: Optimistic Studies*, trans. Peter Chalmers Mitchell (London: William Heinemann, 1907).

counter the social problems which human bodies produced in the modern world. He believed that the rigours of evolution had left humans ill-equipped with a multitude of redundant biological and behavioural features that set humans in antagonism to the environment; these he termed “disharmonies.” In this way he maintained that certain biological, psychological, and behavioural characteristics that had long been deemed sinful, unnatural, and/or degenerate were still abnormal, undesirable, and purposeless even if they were, in essence, natural. Only science, he argued, could redress the antagonisms that blighted modern human life, alleviating and annihilating the varying deformities, ailments, and social ills Metchnikoff outlined in his books. For Metchnikoff this involved a strict dietary regimen. In this audacious biological vision of human progress, biologists were the new standard-bearers of civilisation.

Metchnikoff considered that disharmonies of the sex organs provided “the clearest proof of the essential disharmony in the organisation of man.”¹² He acknowledged that “[p]erversion of sexual instinct is frequent enough amongst animals”, referring specifically to onanism (masturbation) and “[a]bnormal pairing” in the stag beetle, in bees, and especially among cockchafers (Metchnikoff’s sources here were the second edition of Charles Féré’s *L’Instinct sexuel* and Albert Moll’s *Untersuchungen über libido sexualis*).¹³ Explicitly asserting what can be taken to be a core trope of the new, modernist biological sexology, Metchnikoff believed that love and sexuality in all its disharmonious components were ultimately reducible to the fusion of gametes. “In the human race,” he wrote, “reproduction is brought about by the union of the sexes suggested by sympathy or mutual love. The sexual union makes it possible for the male elements or spermatozoa to reach the eggs and fertilise

¹² Metchnikoff, *Nature of Man*, ix.

¹³ Ibid., 34, 35. On same-sex sexual behaviours in non-human animals in late-nineteenth-century science writing, see Brooks, “All Too Human.”

them by passing into them.”¹⁴ Of the sexual organs (generally referred to as “reproductive” organs in his text), he remarked that there were, “many sides on which they are disharmonious or badly adapted.”¹⁵ He described the reproductive organs as being comprised of composite structures, some of ancient origin and others of more recent evolutionary acquisition. The internal organs, he wrote, exhibited traces of “a remote hermaphroditism”, continuing:

In the male, there occur traces of the female apparatus, rudiments of the uterus and fallopian tubes. In the female, on the other hand, rudiments of the male structure persist. These traces date very far back in the history of the race, for they occur also in most other vertebrates. The facts seem to indicate that, at a very remote period, the ancestral vertebrates were hermaphrodite, and that they became divided into males and females only gradually, still retaining in each sex traces of the other sex. Such traces occur frequently, even in adult man, in the form of rudimentary organs (known as the organs of Weber, of Rosenmüller, and so forth).¹⁶

Metchnikoff believed that many of the rudimentary structures of the internal reproductive organs had degenerated further in humans than other animals, but they were nonetheless occasionally the cause of “monstrous growths”.¹⁷

Of the more recent acquisitions of the reproductive organs, the main disharmonies Metchnikoff described concerned female anatomy. He regaled his readers at length about the apparent biological disharmonies of the hymen, menstruation, and physical pain during childbirth. Of males, he wrote only of the loss of the os penis bone, found in other primates. Metchnikoff did not know why human males did not possess the structure; possibly, he wrote, “[i]t may be that certain ossifications of most rare occurrence may represent an atavistic inheritance from our

¹⁴ Ibid., 94.

¹⁵ Ibid., 87.

¹⁶ Ibid., 79.

¹⁷ Ibid., 80.

remote ancestors.”¹⁸ Most remarkably, Metchnikoff extended his analysis of ancient rudiments, more recent but mismatching structures, and mysterious atavisms to sexual development and sexualities. Puberty, he asserted, was “a most striking instance of disharmony exhibited in the order of the development of the human reproductive apparatus.”¹⁹ For Metchnikoff, puberty demonstrated the complex mosaic of different, often conflicting, component elements that between them constituted reproductive functions; in his words, “[t]he different factors of the sexual function develop independently and unharmoniously.”²⁰

Utterly replete with disharmonies—between puberty and the maturity of the body and between the sexual development of females and males—Metchnikoff considered that the disharmonies of sexual maturation gave rise not only to physiological ailments but also to disorders of “[l]ove and the sexual sense”.²¹ The development of sexual excitability before physical maturity was, he argued, the cause of onanism in both sexes. In the sense that it did not serve the reproductive teleology that he routinely and unquestioningly ascribed to the sexual functions, Metchnikoff described onanism as “abnormal” but denied that it was “unnatural”, as had long been claimed in anti-masturbation literature. Arguing that masturbation could be observed in animals, indigenous peoples (“the lowest savages”), and “civilised races” alike, he claimed that onanism “undoubtedly is the result of a natural disharmony in the human constitution, of a premature development of sexual sensation.”²² Metchnikoff believed that the development of civilisation, entailing the steady delay of marriage in order that young men could complete their education and nurture a

¹⁸ Ibid., 81.

¹⁹ Ibid., 94.

²⁰ Ibid.

²¹ Ibid.

²² Ibid., 96.

profession, exacerbated the disharmonies of sexuality. He wrote: “Other unfortunate results come from the ripening of the sexual products before the organism is ready for marriage, and before the character has been formed. As men cannot contract marriage before they are ready for it, irregular and frequently harmful sexual aberration may occur.”²³ Such aberrations might even persist after marriage and involve more than the perils of onanism:

Disharmony of sexuality may also occur between persons of different sexes. The fact that sexuality is usually more precocious in the male sex often produces a disharmony in the case of married persons. At the time when a woman is still in full possession of this specific irritability, the appetite in the man may be on the wane. From this disharmony there often follows conjugal infidelity or passion between persons of the same sex.²⁴

Whereas he generally ascribed sexual disharmonies to young people, the continuance of sexual excitability or “irritability” into later life or after the reproductive organs had ceased to be productive was, Metchnikoff wrote, “another source of disaster.”²⁵ Such biologically-driven disasters, in old and young alike, were construed as abnormal and purposeless, but, Metchnikoff had to admit, nevertheless the result of a natural social evolution, albeit it one that had been piecemeal and discordant. “It is clear, however,” he wrote, “when we consider the disharmonies in the development and activities of the functions in question, that the apparently paradoxical and strange aberrations of sexuality are natural enough.”²⁶

Despite repackaging sex variations, long construed as sinful or unnatural, in biological terms that remained derogative, the publication of Mitchell’s translation of *The Nature of Man* was a bold move, some nervousness about its reception possibly

²³ Ibid., 99.

²⁴ Ibid.

²⁵ Ibid., 100.

²⁶ Ibid.

occasioning the earnest apologetics that open the book. In his preface to the work Metchnikoff sought to excuse his chapter on reproduction, claiming that he had written the book for “disciplined minds”, especially biologists, and did not have the general public in mind when he wrote it.²⁷ In his editor’s introduction to the English translation, Mitchell went to even greater pains to excuse the sexual content of the work:

In several parts of this volume, and particularly in the chapter dealing with disharmonies in the reproductive functions, there is much plain speaking on matters that modern civilisation attempts to conceal. I have not had the impertinence to suppress or to alter a line or a word of these pages. They are written in high seriousness on fundamental facts of the constitution of man; they relate to problems and difficulties that every age in the history of man has had to face, and that are dealt with in the plainest language in the books of all the religions. For the first time proper knowledge has been brought to the task, and it is to be remembered that this volume is an attempt to explain mysteries of the flesh and of the spirit of which all existing explanations have failed to satisfy humanity.²⁸

Mitchell’s progressive attitude towards the open discussion of sex variations in a popular work, unusual for a British scientist of eminence in his period, is underscored by an anecdote that he related in *My Fill of Days*. He was, in fact, an acquaintance of Oscar Wilde (he also knew Wilde’s lover Robbie Ross) and Wilde took him as a model for the character of the scientist Alan Campbell in *The Picture of Dorian Gray* (there is no suggestion that Mitchell himself was queer). Following Wilde’s release from prison in May 1897, and during his self-imposed exile in France, he and Mitchell met coincidentally in a café in Fontainebleau. Recognising Wilde, Mitchell’s friends left their table to warn the café’s owners, but Mitchell went over to speak to him, and the two men sat talking for more than two hours. Mitchell

²⁷ Ibid., ix.

²⁸ Ibid., vi-vii.

invited Wilde to dine with him that evening, but Wilde declined, knowing that Mitchell's friends would not tolerate it. Seeking to explain why his friends were so against being in Wilde's presence, Mitchell wrote: "The trial and the two years in prison were over. *The Ballad of Reading Gaol* had been published and Wilde had left England. But still some of the almost gleeful ferocity with which his fall had been received was there. I could not understand it. The sin, at that time at least, had a lure for very few, and to most merely was an unpleasant mania requiring treatment rather than punishment."²⁹

Another remarkable circumstance emerges from Mitchell's memoir. In passing he mentions that he translated the 1906 English edition of Otto Weininger's *Geschlecht und Charakter*, a fact that has not previously been recognised in historiography. Recalling how he had long failed "to get food or stimulus" from German literature, he wrote: "Three exceptions I found, Heine, Nietzsche, to whose German text I went back after reading him in translation, and Weininger, the mad genius who died by his own hand at the age of twenty-three and whose book, *Sex and Character*, I translated for Heinemann in 1906."³⁰

Weininger and his major work have received a great deal of attention by historians of science and medicine, especially Chandak Sengoopta, who has situated *Geschlecht und Charakter* in the broader context of continental sexology and the hegemony of female emancipation movements.³¹ Profoundly anti-Semitic and misogynistic, Weininger proffered a fundamentally biological model of patriarchal

²⁹ Mitchell, *My Fill of Days*, 183. Italics in original text.

³⁰ Ibid., 132. Italics in original text.

³¹ Chandak Sengoopta, *Otto Weininger: Sex, Science, and Self in Imperial Vienna* (Chicago: University of Chicago Press, 2000). See also Michael Schröter, "Fliess Versus Weininger, Swoboda and Freud: The Plagiarism Conflict of 1906 Assessed in the Light of the Documents," *Psychoanalysis and History* 5, no. 2 (2003): 147-73; Judy Greenway, "It's What You Do With It That Counts: Interpretations of Otto Weininger," *Sexology in Culture: Labelling Bodies and Desires*, ed. Lucy Bland and Laura Doan (Cambridge: Polity Press, 1998), 27-43; Nancy A. Harowitz, *Jews & Gender: Responses to Otto Weininger* (Philadelphia: Temple University Press, 1995).

dominance and human existence more generally. Despite his sexism, indeed contradicting his dichotomous construal of “woman” elsewhere in his book, Weininger also promulgated a theory of sexual orientation founded in the principle of primordial intersexuality. He argued that all individuals are constituted of a mixture of female and male elements comprising of sexed elements within each and every cell, a concept influenced by Carl von Nägeli’s then fashionable (but short-lived) theory of idioplasm, and by the action of internal secretions from the gonads, another fashionable but still highly contested medico-scientific concept at the time Weininger was writing. Onto this basic presumption of ubiquitous “sexual transitional forms” or “this bisexuality of life”, Weininger mapped what he believed to be a natural law of sexual attraction based on biological complementarity which, he suggested, operated with mathematical precision.³² Maintaining that there was no such individual who was wholly female or wholly male, he argued that two individuals were attracted to each other in precise algebraic affinity to their own sexual composition, an occurrence that he even represented as statistical formulae.

Weininger by no means excluded homosexuality from this scenario, although—and in common with the German sexologist Magnus Hirschfeld’s theory of sexual transitions—he defined it as an expression of inversion or intersexuality and therefore inextricably associated with male femininities and female masculinities (it has been suggested that Weininger was himself homosexual which is likely but unproven). The existence of individuals who were about equally balanced in masculinity and femininity was, Weininger argued, an expected outcome of this natural bisexual complexity. In the words of the 1906 English translation:

³² Otto Weininger, *Sex & Character* (London: William Heinemann, 1906), 7, 9. As my analysis here chiefly concerns the impact of the English translation of Weininger’s book in Britain, I have used it for these few quotations despite the issues pertaining to its accuracy.

Reference has often been made, and in recent years has increasingly been made, to the relation between homo-sexuality and the presence of bisexual rudiments in the embryonic stages of animals and plants. What is new in my view is that according to it, homo-sexuality cannot be regarded as an atavism or as due to arrested embryonic development, or incomplete differentiation of sex; it cannot be regarded as an anomaly of rare occurrence interpolating itself in customary complete separation of the sexes. Homo-sexuality is merely the sexual condition of these intermediate sexual forms that stretch from one ideally sexual condition to the other sexual condition. In my view all actual organisms have both homo-sexuality and hetero-sexuality.³³

Among the various arguments supporting his view, Weininger believed that accounts of same-sex sexual behaviour in non-human animals (including a major 1900 review article on the subject by the German naturalist and ethnologist Ferdinand Karsch), supported his view of homosexuality as a natural variant. Again in the words of the 1906 translation: “Animals exhibit not merely onanism (which is known to them as to human beings), but also homo-sexuality; and this fact, together with the fact that sexually intermediate forms are known to occur amongst them, I regard as strong evidence for my law of sexual attraction.”³⁴

The quality of the 1906 English translation of *Geschlecht und Charakter* has been criticised severely and justifiably, not least by Ludwig Wittgenstein who (in a private letter to George Edward Moore) called it “beastly”, as well as by Sengoopta, who found that he could rarely quote from it “without significant emendations”, and by Ladislaus Löb, who proffered a thorough critical evaluation of the “totally inadequate” 1906 translation in a prefatory note to his appreciably more accurate 2005 translation.³⁵ Notwithstanding its tangible inadequacies as a faithful translation,

³³ Ibid., 48.

³⁴ Ibid., 49.

³⁵ Ludwig Wittgenstein, *Ludwig Wittgenstein: Cambridge Letters. Correspondence with Russell, Keynes, Moore, Ramsey and Sraffa*, ed. Brian McGuinness and G. H. von Wright (Oxford: Blackwell, 1995), 250; Sengoopta, *Otto Weininger*, 160, n. 1; Otto Weininger, *Sex and Character: An Investigation of Fundamental Principles*, ed. Daniel Steuer with Laura Marcus, trans. Ladislaus Löb (Bloomington: Indiana University Press, 2005), xlvii.

the 1906 *Sex and Character* is historically important. Given the earlier reticence of the British medical establishment to afford credence to sexological works by continental, and even British, authors, the broad, if not always enthusiastic, acceptance of *Sex and Character*, written by an obscure author who was previously unknown to British readers, is significant.

The book was widely reviewed in Britain, although the *British Medical Journal* and *Lancet* did not notice it. Among those periodicals that did, however, was Britain's leading scientific journal, *Nature*, which reviewed *Sex and Character* in March 1907, this being one of the first reviews of a modernist sexological text to be published in the journal. While acknowledging that Weininger's approach "is much more philosophical than scientific", the reviewer ("L. A.") was so intrigued by the biological basis of his model of sex differences that he outlined it in detail in the review (without, it should be noted, any mention of Weininger's discussion of homosexuality).³⁶ Ultimately L. A. was frustrated by the book which, they wrote, wavered between "profound reflections" and "almost laughably unfounded statements of fact." "It is at times stimulating and suggestive," L. A. continued, "but, nevertheless, often irritating, because the central idea seems rather an obsession of a brilliant but inexperienced mind than a conception to which the writer has been driven by carefully considered facts."³⁷

Following his translation of *Sex and Character*, and over the course of his prolific career as one of Britain's most eminent biologists, Mitchell penned a number

³⁶ L. A., "Sex and Character," review of *Sex and Character*, by Otto Weininger, *Nature* 75 (1907): 481-82, 481.

³⁷ *Ibid.*, 482. For some other reviews of *Sex and Character* in British periodicals, see, for example, "Adam Still," review of *Sex and Character*, by Otto Weininger, *Saturday Review*, May 5, 1906, 557-58; "Sex and Character," review of *Sex and Character*, by Otto Weininger, *Hospital*, March 14, 1908, 618; Review of *Sex and Character*, by Otto Weininger, *Bristol Medico-Chirurgical Journal* 24 (1906): 360-63; W. L. Courtney, review of *Sex and Character*, by Otto Weininger, *Daily Telegraph*, February 7, 1906, 12; Havelock Ellis, review of *Sex and Character*, by Otto Weininger, *Mind* 16 (1907): 446-47.

of notable sexological pieces. He wrote the articles on “Reproduction” and “Sex” for the eleventh edition of the *Encyclopædia Britannica* (vols 23 and 24 respectively, both published in 1911), as well as the foreword to Lennox Broster’s *Endocrine Man: A Study in the Surgery of Sex* (1944).³⁸ More importantly, the successful publication of Mitchell’s translation of *Sex and Character* prompted a new wave of sexological books in Britain. Chief among these were more English translations of other major sexological books by continental authors, published in Britain by respectable translators and publishers— albeit, as Philip Kuhn has pointed out, not unproblematically. Kuhn has detailed Rebman’s sexological publications.³⁹ The first was *The Sexual Question: A Scientific, Psychological, Hygienic and Sociological Study for the Cultured Classes* (1908), a translation of *Die sexuelle Frage: Eine naturwissenschaftliche, psychologische, hygienische und soziologische Studie für Gebildete* (1905) by the leading Swiss psychiatrist and eugenicist Auguste Forel.⁴⁰ It was translated by Charles Frederick Marshall, a former Assistant Surgeon at London’s Hospital for Diseases of the Skin. A more prolific translator of sexological books was Maurice Eden Paul, an English physician, writer, and socialist reformer. For Rebman he translated Iwan Bloch’s *Das Sexualleben unserer Zeit in seinen Beziehungen zur modernen Kultur* (1907), published as *The Sexual Life of Our Time in Its Relations to Modern Civilization* in 1908.⁴¹ As Kuhn outlines, this translation, despite being well reviewed, was subject to a complaint and was subsequently

³⁸ *Encyclopædia Britannica*, 11th ed. (1911), s.v. “reproduction”; *Encyclopædia Britannica*, 11th ed. (1911), s.v. “sex”; Peter Chalmers Mitchell, foreword to *Endocrine Man: A Study in the Surgery of Sex*, by L. R. Broster (London: William Heinemann, Medical Books, 1944).

³⁹ Philip Kuhn, “The Sexual Life of Our Time: Medical Censorship in Early-20th-Century England,” *History of Psychology* 23, no. 1 (2020): 40-61. Kuhn, however, makes no reference to the English *Sex and Character* which evidently prompted the sexological publishing frenzy that took place in Britain after its publication.

⁴⁰ August Forel, *The Sexual Question: A Scientific, Psychological, Hygienic and Sociological Study for the Cultured Classes*, trans. C. F. Marshall (London: Rebman, 1908).

⁴¹ Iwan Bloch, *The Sexual Life of Our Time in Its Relations to Modern Civilization*, trans. M. Eden Paul (London: Rebman, 1908).

declared obscene at the Bow Street Magistrates' Court in January 1909. The issue at stake, Kuhn argues, was not so much the content of the book than the way Rebman marketed it to a general readership without the kind of cautionary warning that had long prefaced other sexological works (with varying degrees of sincerity). The directors of Rebman apparently negotiated with the Home Office and swiftly produced a new edition the following April; only Bloch's prefaces were removed and the new version of the translation was duly equipped with a new publishers' note stating the book was intended "to the professions for whom this translation is intended".

The legal impediments to *Sexual Life* were, however, the exception rather than the rule when it came to sexological works. Several others were, like *Sex and Character*, released in Britain without issue. For Rebman, Paul also translated the Austrian gynaecologist Enoch Heinrich Kisch's *Das Geschlechtsleben des Weibes in physiologischer, pathologischer und hygienischer Beziehung* (1904), published as *The Sexual Life of Woman in Its Physiological, Pathological and Hygienic Aspects* (1910).⁴² For George Allen and Company, Paul translated Albert Moll's *Das Sexualleben des Kindes* (1908), published in English as *The Sexual Life of the Child* in 1912.⁴³ Other works, including the first English translation (by A. A. Brill) of Sigmund Freud's momentous *Drei Abhandlungen zur Sexualtheorie* (1905), published as *Three Contributions to the Theory of Sex* in 1910, were produced in the United States and were undoubtedly acquired by medical professionals in Britain.

⁴² E. Heinrich Kisch, *The Sexual Life of Woman in Its Physiological, Pathological and Hygienic Aspects*, trans. M. Eden Paul (London: Rebman, 1910).

⁴³ Albert Moll, *The Sexual Life of the Child*, trans. Eden Paul (London: George Allen & Company, 1912). See also James Foster Scott's *The Sexual Instinct: Its Use and Dangers as Affecting Heredity and Morals* (1908).

Also taking his cue from the successful publication of *Sex and Character* in English, the writer and radical sex reformer Edward Carpenter published one of his most famous works, *The Intermediate Sex: A Study of Some Transitional Types of Men and Women* (1908; 5th ed. 1918), a compilation of earlier essays on the subject of homosexuality, or homogenic love as Carpenter preferred, and appended with numerous quotations from various sexological authorities. Succinctly showing the influence of Weininger's book in Britain, *The Intermediate Sex* is prefaced with an epigraph (slightly modified) extracted from the English translation of *Sex and Character*:

*“There are transitional forms between the metals and non-metals, between chemical combinations and simple mixtures, between animals and plants, between phanerogams and cryptogams, and between mammals and birds. . . . The improbability may henceforth be taken for granted of finding in Nature a sharp cleavage between all that is masculine on the one side and all that is feminine on the other; or that any living being is so simple in this respect that it can be put wholly on one side, or wholly on the other, of the line.”*⁴⁴

Carpenter made several further quotations from *Sex and Character*, and other sexological works, in the appendix of his book.⁴⁵

To the extent that Mitchell's identity as the anonymous translator of *Sex and Character* was known among his contemporaries, his (and Heinemann's) close and authoritative involvement goes some considerable way towards explaining why the book was taken so seriously in Britain, even where it was not liked, and where earlier sexological works had been severely rebutted. Whatever his personal influence on the impact of *Sex and Character* in Britain, and no matter what others have said

⁴⁴ Edward Carpenter, *The Intermediate Sex: A Study of Some Transitional Types of Men and Women* (London: Swan Sonnenschein, 1908), n. p. (epigraph). Italics in original text. For the original passage, see Weininger, *Sex and Character*, 2-3.

⁴⁵ *Ibid.*, 136, 139-40, 164.

about his translation, Mitchell's active interest in Weininger's sexology, and other texts with significant sexological tropes such as Metchnikoff's *Nature of Man*, underscores the escalating degree to which British biologists were involving themselves with sex-related subjects through the Edwardian era, even as medical journalists continued to decry homophile sexology from the pages of the *British Medical Journal* and the *Lancet*.

Mendelism, 'Sex' Chromosomes, and the Queer Possibilities of Binary Genetics

The interest shown by *Nature*, and other leading British periodicals, in *Sex and Character* reflects a broader shift in the conceptualisation of sex differences and sexualities. New discoveries in genetics and endocrinology inaugurated a sea change in the way that sex-related questions were treated by biologists and their interlocutors in Britain, especially those pertaining to the age-old conundrum of sex determination. In tandem with new sexological works and translations that followed the English edition of *Sex and Character*, literature on sex determination also proliferated through the Edwardian era. Evidently prompted by the sensational publication of *Schenk's Theory*, Rebman published an English translation of *Willkürliche Zeugung von Knaben und Mädchen, vorgetragen im Verein praktischer Ärzte zu Moskau* (1895), by a little known Moscow-based physician named Eduard Seligson, although Rebman's version, *Sex Determination: A Treatise on the Control of Sex in Generation* (1901), appeared with little of the sensation that had surrounded Schenk's book.⁴⁶

⁴⁶ Eduard von Seligson, *Sex Determination: A Treatise on the Control of Sex in Generation* (London: Rebman, 1901).

Seligson's theory promulgated the age-old premise that the sex of offspring was determined by whether the fertilised ova had originated from the left ovary, producing daughters, or the right, producing sons (Seligson further believed that only sperm produced from the right testicle fertilised "male" ova while sperm from the left only fertilised "female" ova). Not to be outdone, Walter Scott astutely published a revised edition of Patrick Geddes and J. Arthur Thomson's influential *The Evolution of Sex* (originally published in 1889) in 1901.⁴⁷ Sarah S. Richardson has shown how influential Geddes and Thomson's metabolic theory of sex development continued to be through the Edwardian era, not least among the early geneticists.⁴⁸ Geddes and Thomson continued to reassert their long-standing reputations as authorities on the biology of sex; in 1912 they produced a sex advice guide, *Problems of Sex*, while in 1914 they published a short work, titled simply *Sex*, as part of the popular Home University Library of Modern Knowledge, simultaneously published in London by Williams and Norgate and in New York by Henry Holt and Company.⁴⁹

Other British science writers who concerned themselves with the question of sex determination through the Edwardian era include Joseph Thomas Cunningham, an English zoologist and a leading proponent of neo-Lamarckism.⁵⁰ After Schenk's sensational theory was forgotten, the most popular book on sex determination was *The Causation of Sex: A New Theory of Sex Based on Clinical Materials Together*

⁴⁷ Patrick Geddes and J. Arthur Thomson, *The Evolution of Sex*, revised edition (London: Walter Scott, 1901).

⁴⁸ Richardson, *Sex Itself*, 26-27.

⁴⁹ Patrick Geddes and J. Arthur Thomson, *Sex* (London: Williams and Norgate, 1914).

⁵⁰ See, for example, Joseph Thomas Cunningham, "Sex and Sexual Characters," *Science Progress in the Twentieth Century: A Quarterly Journal of Scientific Work and Thought* 4 (July 1909-April 1910): 457-73; Joseph Thomas Cunningham, "The Heredity of Secondary Sexual Characters in Relation to Hormones, a Theory of the Heredity of Somatogenic Characters," *Archiv für Entwicklungsmechanik der Organismen* 26 (1908): 372-428; Joseph Thomas Cunningham, *Sexual Dimorphism in the Animal Kingdom: A Theory of the Evolution of Secondary Sexual Characters* (London: A. and C. Black, 1900).

with *Chapters on the Forecasting of the Sex of the Unborn Child, and on the Determination or Production of Sex at Will* (1909, 3rd ed. 1921), by a retired obstetrician, Ernest Rumley Dawson (the book was published in America as *The Secret of Sex*).⁵¹ Like many before it, Dawson's theory was founded on age-old principles of laterality—again ova from the left ovary producing female offspring, ova from the right ovary producing males. Additionally, Dawson believed that the father played no role in sex determination. *The Causation of Sex* was his only book but it was widely reviewed and discussed, even after two of Britain's leading biologists, Leonard Doncaster and F. H. A. Marshall, collaborated to disprove Dawson's theory in the first issue of the *Journal of Genetics* (November 1910).⁵²

The largely unquestioned acceptance and popularity of the notion of wilful sex selection also prompted a few amateur contributions. For example, in 1907 a Mrs S. J. Pratt of Manchester self-published a little guide, *Regulation of Sex: A Hand Book for Married Women* (also on the front cover: "Every Woman to Predetermine and Regulate the Sex of Her Children"). Pratt's theory, only explained in a cursory manner, ascribed the determination of sex to the law of gravitation. Interested readers were advised to contact Pratt directly for practical instruction on how to control, "beyond any possibility of failure", physical sex as well as temperament and mentality of children, and to eliminate any undesirable family traits.⁵³ Such personal service undoubtedly came at a price.

⁵¹ Ernest Rumley Dawson, *The Causation of Sex: A New Theory of Sex Based on Clinical Materials Together with Chapters on the Forecasting of the Sex of the Unborn Child, and on the Determination or Production of Sex at Will* (London: H. K. Lewis, 1909). See also Ernest Rumley Dawson, "The Essential Factor in the Causation of Sex: A New Theory of Sex," *Transactions of the Obstetrical Society of London* 42 (1901): 356-97.

⁵² Leonard Doncaster and F. H. A. Marshall, "The Effects of One-Sided Ovariectomy on the Sex of the Offspring," *Journal of Genetics* 1 (1910): 70-72.

⁵³ S. J. Pratt, *Regulation of Sex: A Hand Book for Married Women* (Manchester: S. J. Pratt, 1907), quotation inside back cover.

Another self-published work that proffered advice on how to procure children of the desired sex, *Essay on the Determination of Sex* (1908), was written by the Reverend Richard Ussher of Westbury Vicarage in Brackley, Northamptonshire. For Ussher, the desirability of sex selection, for which he recommended a regimen of diet and discipline during the early days of gestation, was founded on his concern to maintain an equal sex ratio by way of avoiding sexual sins. His tract begins: “It must be conceded by every thinking mind that an even balance of the sexes is eminently desirable, for where a balance does not exist the conditions under which populations are placed become disorganised, hence may evils arise most prejudicial to the welfare and prosperity of the State, and still more so to the individual.”⁵⁴ Later in his text, Ussher refers specifically to prostitution as the adverse effect of a surplus of males within a population.

Ussher’s theory was another that perpetuated the idea that sex was determined by the nutrition of the expectant female during the first few days of gestation, a notion that he thought was borne out by his own, extensive experiments on plants, insects, birds, mice, white rats, guinea pigs, rabbits, dogs, cows, and horses. For humans he looked to sex ratio statistics drawn from workhouses in England (“for they show that children of tramps and wanderers of all descriptions bear a very large percentage of male to female births”) and from his comparison of various regions that he described as being better or worse fed.⁵⁵

Much of the popular literature on sex determination and its control perpetuated the simple, marketable idea that science could be used to control the generation of male or female offspring at will. Still, even some popular writers recognised that certain individuals (human and non-human) were born intersexed

⁵⁴ Richard Ussher, *Essay on the Determination of Sex* (Brackley: R. Ussher, 1908), 1.

⁵⁵ *Ibid.*, 9.

(“hermaphrodites”), that certain species were normally dual-sexed, and that credible models of sex determination had to account for such occurrences. The question of secondary sexual characteristics, as variable in their development across individuals of a species as primary sexual characteristics, was also prescient to any credible theory of sex determination. As outlined in the introduction to this thesis, Charles Darwin had situated secondary sexual characteristics as an integral part of his model of heredity (pangenesis) and theory of sexual selection, insisting that the sexual characteristics of one sex existed in a latent state in the other and could be developed under certain circumstances. *The Descent of Man* had raised a broad range of sex-related questions (including sex ratio, inheritance of sex traits, and avian sex transformation) all of which any modern theory of sex determination had to grapple with if it were to account for a broader range of biological phenomena than simply the genital sex of human offspring. In this scenario—especially given the slow rate at which knowledge about the puzzling “sex” chromosomes and “internal secretions” was accrued through the early twentieth century—the principle of primordial hermaphroditism (dual-sexed origins) continued to convince. It offered a credible, if somewhat vague, epistemological framework for situating and deliberating the major questions of sex determination and development in modern biological terms across a broad range of medico-scientific genres.

Citing the German biologist Carl Gegenbauer as well as Geddes and Thomson’s *Evolution of Sex* as authorities, Ussher, for example, accepted that hermaphroditism was the “universal primitive condition” which was reflected in the earliest stage of human foetal development.⁵⁶ “How else,” he wrote, “except through the prevalence of universal hermaphroditism, can we account for the rudimentary

⁵⁶ Ibid., 3.

breasts, etc., found in all male animals. We readily observe that those organs which are rudimentary in the male are perfected in the female, and so it follows that they had but one origin, and that they are adaptable.”⁵⁷

The principle of primordial hermaphroditism was also useful to the first Mendelians.⁵⁸ Mendel had himself been impressed by the apparent parallel between patterns of heredity and patterns of sex distribution in the plants he studied.⁵⁹ Sarah S. Richardson has described how the “sex” chromosomes quickly became embroiled with the Mendelian system of binary oppositions following their initial identification.⁶⁰ “Very early on,” she writes, “Mendelism became associated both with the X and Y chromosomes and with a conception of sex as an either-or binary.”⁶¹ A clear-cut example of this simple binary mode of thinking about genetic sex, with female and male cast as Mendelian unit characters, can be found in the early texts that described the first observations of what came to be called the X chromosome. As is well known, the X chromosome was first identified around 1890 by the German cytologist Hermann Henking. Working on the fire wasp, Henking noticed that some of the insect’s sperm cells contained eleven chromosomes while others contained an additional body, contradicting the then accepted premise that the

⁵⁷ Ibid.

⁵⁸ The literature on the early history of genetics is large. Useful studies which discuss the situation in Britain, all good for further references, include Berris Charnley and Gregory Radick, “Intellectual Property, Plant Breeding and the Making of Mendelian Genetics,” *Studies in History and Philosophy of Science* 44, no. 2 (2013): 222-33; Alan G. Cock and Donald R. Forsdyke, *Treasure Your Exceptions: The Science and Life of William Bateson* (New York: Springer, 2008); Stephen G. Brush, “How Theories became Knowledge: Morgan’s Chromosome Theory of Heredity in America and Britain,” *Journal of the History of Biology* 35, no. 3 (2002): 471-535; Phillip R. Sloan, “Mach’s Phenomenalism and the British Reception of Mendelism,” *Comptes Rendus de l’Académie des Sciences. Serie III: Sciences de la Vie* 323, no. 12 (2000): 1069-79.

⁵⁹ See Gregor Mendel, “Gregor Mendel’s Letters to Carl Nägeli, 1866-1873,” trans. Leonie Kellen Piternick and George Piternick, *Genetics* 35 [supplement, “The Birth of Genetics: Mendel—De Vries—Correns—Tschermak in English Translation”] (1950): 1-29 (see 25-26).

⁶⁰ On the discovery and early study of the sex chromosomes, see Richardson, *Sex Itself*, ch. 2 *passim*.

⁶¹ Ibid., 46.

number of chromosomes were equal within a species. Not knowing how to classify it, he named the additional body the “X element” (i.e., unknown element).

Although he recognised that the X element was only found in males, Henking made no association between his discovery and sex determination. That step was taken by the American zoologist and cytologist Clarence Erwin McClung. Working on grasshoppers, McClung identified Henking’s “X element” as a chromosome, renaming it the “accessory” chromosome. In a seminal paper, published in the *Biological Bulletin* in 1902, McClung tentatively suggested that the accessory chromosome played a role in sex determination (his cautiousness on the issue is reflected in the question mark in the title of the paper, “The Accessory Chromosome—Sex Determinant?”). McClung was led to this discovery by his deduction that two kinds of sperm would lead to two different but numerically equal hereditary outcomes within a species, and the estimate that the division of sex between male and female seemed the most obvious characteristic to fit the bill. In McClung’s words: “We have in the case of the spermatozoa, however, the observed fact that there are two essentially different forms and that they are present in equal proportions. No other feature, save sex, separates the resulting offspring into two approximately equal groups. By exclusion then, it would seem that the determination of this difference is reposed in the male element.”⁶² Richardson describes McClung’s assumption as “[s]imple and tantalizing—a chromosomal dimorphism corresponding to sex dimorphism.”⁶³ Implicitly accepting the premise that female was the default sex, McClung mistakenly believed that the accessory chromosome acted to determine male offspring.

⁶² Clarence Erwin McClung, “The Accessory Chromosome—Sex Determinant?,” *Biological Bulletin* 3 (1902): 43-84, 78.

⁶³ Richardson, *Sex Itself*, 29.

What came to be called the Y chromosome was independently discovered in 1905 by the American geneticists Nettie Stevens and, later the same year, Edmund Beecher Wilson. Both identified chromosomes in males that Wilson called “idiochromosomes” or “idiosomes” and Stevens termed “heterochromosomes.” Writing in February 1906, Wilson designated the pair “sex chromosomes”. As Richardson has discussed, the Y chromosome was afforded little active involvement in the determination of sex, except that its presence barred the pairing of two X chromosomes. With some isolated exceptions, it was not until the 1950s that the sex-determining properties of the Y chromosome were better recognised and, as Richardson shows, assumed a highly gendered role in the Western cultural imagination as the crux of manliness.

The rediscovery of Mendel’s laws and the complex but rapid development of genetics thereafter established a raft of new terms and concepts by which sex determination, sex development, and sex differences could be considered. In his momentous 1900 rediscovery paper, entitled “Sur la loi de disjonction des hybrides” (On the Law of Hybrid Separation) and published in the *Comptes Rendus de l’Academie des Sciences*, Hugo de Vries described “dominant” and “latent” traits, also using the term “recessive” (“caractère récessif”) as an alternative for “latent”.⁶⁴ William Bateson coined several new scientific terms, not least “genetics” in 1906, but also, among others, “allelomorphs”, to refer to contrasting traits as well as “homozygous” and “heterozygous” to refer to alike and differential genetic constitutions.

Despite McClung’s formative and highly simplistic assumption of a basic duality of genetic sex, the new vocabulary and conceptual premises of genetics

⁶⁴ Hugo de Vries, “Sur la loi de disjonction des hybrides,” *Comptes Rendus de l’Academie des Sciences* 130 (1900): 845-47, 845, 846.

constituted an increasingly complex matrix of dualities that were quickly and deftly applied to sex variations, especially intersexualities, which had long been described in terms of hybridity and latency, not least in Darwin's major works. This important aspect of the early development of genetics has not hitherto been sufficiently considered. The possibility that the sex of an individual might be determined in the manner of a heterozygous trait—with one sex being dominant, the other recessive or latent—did not preclude biologists envisaging combinations of sex factors that might produce intersexed offspring. Indeed, occurrences of intersexualities and transformations of sex (such as avian sex reversal) required that the first Mendelians consider multiple and queer permutations of the two basic (female and male) sex factors, although approaches were hugely varied. Writing in 1910, the Oxford biologist Geoffrey Smith, whose original contributions to the new genetics are discussed in the next chapter of this thesis, succinctly expressed this inclusivity of the new genetics of sex:

The conceptions of segregation, of allelomorphism, of heterozygotism, to employ the accepted terminology of Professor Bateson, seem admirably suited in their application to the phenomena of sex, because in sexual reproduction we actually see that the sexual characters do segregate into two sharply separated sets of individuals, the males and the females, as if maleness and femaleness were in some way allelomorphic to one another, while the occurrence of hermaphrodite forms and the latent presence in one sex of characters proper to the opposite sex indicate the phenomenon of heterozygotism or sex-hybridism.⁶⁵

Indefatigably queer takes on Mendelian heredity were made before Smith was writing, and necessarily so. Despite McClung's silence on the matter, other geneticists quickly recognised that hermaphroditisms presented challenges to an overly simplistic conceptualisation of sex determination by means of gamete

⁶⁵ Geoffrey Smith, "Studies in the Experimental Analysis of Sex," *Quarterly Journal of Microscopical Science* 54 (1910): 577-604, 577.

differentiation. William Bateson and another pioneering English geneticist, Edith Rebecca Saunders, stated as much in the first of their historic Reports to the Evolution Committee of the Royal Society, originally presented to the Committee in December 1901 and subsequently published in 1902.⁶⁶ Among its several important contributions to the new genetics, this work was the first to link the rediscovery of Mendel's laws of heredity with McClung's identification of the "accessory" chromosome in certain insects and other arthropods. Importantly, Saunders and Bateson recognised that gametic differentiation, as it applied to sex determination, must sometimes be an attribute of the male cells, sometimes an attribute of female cells, and possibly sometimes both. Against the theory of gametic differentiation, they wrote, were breeding experiments that produced a skewed sex ratio in offspring, including numerous hermaphrodites in first crosses.

Inspired by Bateson and Saunders, the first biologist to proffer a comprehensive model of sex determination based on newly rediscovered Mendelian principles, influential among British biologists, was the prominent American geneticist William Ernest Castle. Richards refers to Castle only briefly, remarking that he offered an elaborate model that sought to provide a fully Mendelian theory of sex.⁶⁷ Castle's innovative theory is deserving of better recognition, demonstrating as it does the broad intellectual and textual basis upon which the first Mendelians drew in their efforts to reconceptualise sex in genetic terms. In seeking to account for "sex-heredity" in a paper published in 1903, Castle drew directly from Darwin who had promulgated the notion that in dioecious organisms each sex contained the

⁶⁶ William Bateson and Edith Rebecca Saunders, "Reports to the Evolution Committee of the Royal Society. Report I: Experiments Undertaken by W. Bateson, F.R.S., and Miss E. R. Saunders," in *Reports to the Evolution Committee of the Royal Society: Reports I-V., 1902-09* (London: The Royal Society, 1910), 1-160, 138-39.

⁶⁷ Richardson, *Sex Itself*, 47.

characteristics of the other sex in latent form.⁶⁸ Castle believed that Darwin had presented sufficient evidence for the premise, including the existence of rudimentary organs in one sex that were developed in the other, as well as the phenomenon of an animal, in old age, developing the characters (“even instincts”) that were characteristic of the opposite sex.⁶⁹ Most of all, the fact that males could produce female offspring and that females could produce male offspring, Castle argued, provided the strongest evidence of the latency of each sex in the other. He therefore maintained, à la Darwin, that all individuals of sexually dimorphic species were essentially dual-sexed. In Castle’s words:

Sex in dioecious animals and plants is inherited in accordance with Mendel’s law; that is, in accordance with the principles of dominance and segregation. The ordinary dioecious individual is a sex-hybrid or “heterozygote” (Bateson), in which the characters of both sexes are present, one dominant, the other recessive. In the male, the female character is recessive, and conversely in the female, the male character; but each sex transmits the characters of both.⁷⁰

In seeking to accommodate Darwin’s observations within a Mendelian theory of sex inheritance, Castle suggested that the gametes, eggs and sperm, were all individually sexed. A male egg, he asserted, could only be fertilised by a female sperm, and vice versa (the principle of selective fertilisation). A fertilised egg was therefore always hermaphrodite. Adapting Mendel’s principle that when two opposing characters combine during the process of fertilisation one will be dominant, the other recessive, Castle suggested that, in dioecious species, whether a fertilised egg develops as a female or a male depends on which is dominant and which is recessive. He wrote that:

⁶⁸ William Ernest Castle, “The Heredity of Sex,” *Bulletin of the Museum of Comparative Zoölogy at Harvard College* 40 (1903): 187-218, 191.

⁶⁹ *Ibid.*, 193.

⁷⁰ *Ibid.*

in a dioecious species the male and female characters meet anew in a struggle for supremacy at each fertilisation. Sometimes one, sometimes the other, dominates in the zygote, the vanquished character becoming recessive. Exceptionally, as in the occasional or the mixed hermaphrodite of a dioecious species, the fight is indecisive, and neither combatant is supreme.⁷¹

Castle explicitly stated that what he termed “[t]he occasional occurrence of cases of true hermaphroditism, in species normally dioecious”, as well as occurrences of gynandromorphs, provided hard evidence for his theory.⁷²

Castle’s original theory was swiftly rendered outmoded by what was a rapidly developing line of biological enquiry (reflecting this, he put forward a revised theory in 1909). In its time though, it was nonetheless profoundly influential by its establishment of a vibrant discourse on the genetic determination of sex among leading biologists. This discourse centred on intersexualities and other sex variations as arbiters of the viability of competing theories. Evidence of how Castle’s theory was used in Britain is found in the eclectic writings of Walter Heape who, as Adele E. Clarke has discussed, played an integral role in pioneering the field of “reproductive” physiology in Western medical science. Clarke briefly mentions that Heape wrote about sex determination, but she makes little of it.⁷³ Heape concerned himself with the closely related questions of sex determination and sex ratio on several occasions. In common with Castle’s theory, Heape’s original model of sex determination did not endure for long but is nonetheless historically interesting, not least for his striking use of Peter Chalmers Mitchell’s 1906 English translation of Otto Weininger’s *Sex and Character*. This is a significant move, allying the new genetics of sex with continental sexology (at the height of its explanatory power, or at least its textual profligacy, at the time Heape was writing) and thereby implicating

⁷¹ Ibid., 196.

⁷² Ibid., 197.

⁷³ Clarke, *Disciplining Reproduction*, 70.

notions of sexual inversion and homosexuality as minor forms of hermaphroditism within genetics, albeit somewhat guardedly.

Drawing on Mendelian principles, Heape, writing in 1907, asserted that the gametes were sexed and that the sex of offspring was determined at the moment of fertilisation and could not be changed thereafter by external influences. Still, however, he argued that the production of gametes of a particular sex was amenable to a level of control by a variety of external influences. In seeking to account for how this might happen, he argued that the essential sex of each gamete was hermaphrodite. His rhetoric is heavily indebted to Weininger. For example, Heape asserted: “I will venture to maintain there is no such thing as a pure male or female animal, but that all contain a dominant and recessive sex, except those hermaphrodites in which both sexes are equally represented.”⁷⁴ The appearance of “recessive male characteristics” in adult females of sexually dimorphic species, and “recessive female characteristics” in adult males, was, Heape wrote, of undoubted occurrence. To this he added “and not only from a structural point of view”, which suggests that Heape is alluding especially to homosexuality, given that Weininger, one of the major theorists of homosexuality at the time, was one of his chief sources.⁷⁵ Heape subsequently reiterated that his analysis was not limited to physical features but extended to “functional” psychological and behavioural characteristics. For example, he stated: “The assumption of male characteristics in old females and of female characteristics in old males is common knowledge and is evident not only in structural modifications but in modified mental traits.”⁷⁶

⁷⁴ Heape, “Notes on the Proportion,” 123.

⁷⁵ Ibid.

⁷⁶ Ibid., 124.

Heape believed that such occurrences, as well as more pronounced instances of dual sexuality, were ample demonstration “that all animals contain the elements of both sexes in some degree.”⁷⁷ Following from this, he thereby extended the principle of primordial hermaphroditism to the sex of gametes. In Heape’s words: “But if it is true that the adult animal is never purely male or female it may be argued that the sexual products are similarly constituted. In that case an ovum or a spermatozoan contains dominant male or female characteristics as the case may be, and recessive characteristics of the opposite sex.”⁷⁸ He goes on:

In such case the possibility of infinite gradations of sexual differentiation in an individual would be vastly increased and, from the point of view of heredity, such complex conditions carry with them factors of the greatest importance. For instance, the sexual selection which is undoubtedly, though unconsciously, exercised by civilised peoples, renders it probable that the recurrence in a nation, at long intervals of time (as suggested by Weininger “Sex and Character,” 1906), of an increased or reduced proportion of so called effeminate men or of masculine women, or of the ebb and flow of a number of national characteristics intimately associated with the predominance of characteristics peculiar to one or the other sex (such as the desire for war, national hysteria, social sexual problems, &c.), may thus be accounted for. Weininger ably maintains, and it seems clear, that national characteristics of this nature are definitely correlated with the sum of dominant sexuality which exists at any one time.⁷⁹

Much of Heape’s subsequent analysis concerns the question of whether the ova or sperm was more dominant in determining the sex of offspring, a question to which he could offer no definitive answer.

Despite proffering such an apparently dynamic and inclusive model of sex determination, Heape’s analysis did not extend to a progressive attitude towards gender and sexual equality among the British scientific community or in the country

⁷⁷ Ibid., 123.

⁷⁸ Ibid., 124.

⁷⁹ Ibid.

more generally. Far from it. As Lisa Carstens and Anne Fausto-Sterling have previously discussed, Heape published a couple of profoundly sexist popular books which directly targeted the suffragettes at the height of their campaign for enfranchisement in late-Edwardian Britain.⁸⁰ The most significant of these is *Sex Antagonism* (1913). He also wrote *Preparation for Marriage* (1914), a self-help sex guide published as part of Cassell and Company's "Questions of Sex" series. The works are worth re-examining in the light of Heape's earlier exposition of sex determination in order to better contextualise his rhetoric and argument, which were indebted to his earlier, idiosyncratic amalgam of Mendelian genetics and Weininger's *Sex and Character* (Fausto-Sterling, for example, discusses Heape in the context of endocrinology which, I argue, does not fully explain his approach).

In both *Sex Antagonism* and *Preparation for Marriage*, Heape argued that women and men were fundamentally different at the level of biology and therefore naturally suited to complementary social roles—the women's role being essentially only that of a dutiful wife and mother. The "sex war" which bedevilled men such as Heape through the Edwardian age was, he argued, the result of a certain class of women who had allowed their latent masculine characteristics, physical and psychological, to become too developed and socially disruptive. Heape made no mention of Weininger in either work, but the influence of *Sex and Character* is palpable as Heape engages in a profoundly sexist tirade against women and the suffragette movement, ostensibly based on biological principles (although much of *Sex Antagonism* chiefly engages with ethnographic literature) but more readily exercising a profound personal misogyny. Also in common with Weininger, Heape made little attempt to relate his defence of biologically-ordained gender roles to his

⁸⁰ Carstens, "Unbecoming Women," 76-79; Fausto-Sterling, *Sexing the Body*, 156-57.

earlier defence of the principle of primordial hermaphroditism. Indeed, Heape actually makes very little in-depth analysis of the biological premises he asserts but nonetheless deploys the rhetoric of Mendelian genetics, or at least his take on it. At the end of *Sex Antagonism*, for example, he refers to “recessive male qualities” in women:

It seems clear that a woman’s usefulness, her value to society, and therefore her power and her happiness depend, not on her likeness to but on her dissimilarity from man. By training her recessive male qualities she can never attain to more than a secondary position in the social body; but by cultivating her dominant female qualities, by increasing their value, she will gain power which no man can usurp, and will attain that position as a true complement of man which is essential for the permanence of the vigour of the race.⁸¹

Notably, Heape proceeds to relate his highly judgemental analysis to “effeminate Males”, remarking that “[i]t may be further noted that it is also conceivable that the production of effeminate Males is associated with the stimulation of Male characteristics in the mother.”⁸² Even in this scenario then, the masculine woman was responsible for men’s sexual ills.

There is marginally more elaboration of Heape’s biological sexual schema in *Preparation for Marriage*, which better demonstrates his freewheeling extension of Mendelian rhetoric and concepts, with little by way of theoretical analysis, to achieve deeply prejudiced cultural and personal ends. Arguing that “[e]very individual of one sex has in him or her qualities of the other sex in a less degree”, Heape wrote:⁸³

It is convenient to express this fact by saying that the normal man has dominant male and subordinate female qualities, while the normal woman has dominant female and subordinate male qualities. The meaning I attach to these terms is—that *dominant characters* are of primary importance and exert the most powerful influence on the

⁸¹ Walter Heape, *Sex Antagonism* (London: Constable and Company, 1913), 213.

⁸² *Ibid.*, 214.

⁸³ Walter Heape, *Preparation for Marriage* (London: Cassell and Company, 1914), 101.

individual; while *subordinate characters* are of secondary importance and power, but are still capable of independently asserting their influence on the individual. Subordinant characters are not therefore the servants of dominant characters, they are in reality, though more or less feebly, antagonistic to them.⁸⁴

Heape did not believe that it was possible for so-called subordinate characteristics to fully supplant dominant ones, but he nonetheless described how “a man may so develop that he becomes more approximate in his nature to the female type than is the normal male, and similarly a woman may assume male characteristics to a greater extent than does the normal female”.⁸⁵ Thus by adopting the rhetoric of Mendelism and by extending the principle of dominant and recessive genetic traits to the entirety of an individual’s body and psychology, Heape grounded his argument that the suffragettes were masculinised women who had developed their subordinate male qualities to such an extent that they were attempting to assume masculine privileges. It was an audacious exercise in science popularisation, one that actively sought to mitigate the potential of the new genetics to usurp hegemonic gender and broader cultural norms. Heape’s popular works also attest to the influence of Weininger’s *Sex and Character* which had attempted to achieve a similar end and, more broadly, the rapid transmission of new, Mendelian models of sex across different genres of scientific writing, a key theme of this thesis.

The new genetics of sex was hastily and widely disseminated across a range of English-language science publications that were available in Britain at all levels of society, effectively establishing a new genre of sexological writing that deserves greater attention in historiography. Mendelism was a popular subject and the rapidly developing scientific territory meant that the principal books on the subject appeared

⁸⁴ Ibid., 101-2. Heape’s italics.

⁸⁵ Ibid., 102-3.

in multiple editions through the Edwardian era and beyond. Works by British scientists that include significant discussions of sex include *Mendelism* (1905; 7th ed. 1927) by R. C. Punnett; *Recent Progress in the Study of Variation, Heredity, and Evolution* (1906, 5th ed. 1920) by Robert Heath Lock; *Heredity* (1905 or 1906) by C. W. Saleeby; *Heredity* (1908; 5th ed. 1926) by J. Arthur Thomson; *Mendel's Principles of Heredity* (1909, updated 1913) by William Bateson; *Heredity in the Light of Recent Research* (1910; 3rd ed. 1921) by Leonard Doncaster; *The Laws of Heredity* (1910; 2nd ed. 1911) by G. Archdall Reid; and *Breeding and the Mendelian Discovery* (1911; 2nd ed. 1912) by Arthur Dukinfield Darbishire.⁸⁶ Leonard Doncaster's 1914 work *The Determination of Sex* offered a thorough book-length treatment of the subject from a Mendelian perspective. Similarly, the leading American biologist Thomas Hunt Morgan's *Experimental Zoölogy* (1907), published in New York and London by Macmillan, and *Heredity and Sex* (1913, 2nd ed. 1914), published in America but well known to British biologists, were major contributions to the genre that situated sex, including sex variations, at the heart of the new genetics, for good or ill.⁸⁷ Further elucidation of how attitudes towards sex variations continued to shape the continued development of sexological biology in Britain and elsewhere, and thereby the production of sexual knowledge through the early decades of the twentieth century, is contained in the next chapter of this thesis.

⁸⁶ A. D. Darbishire, *Breeding and the Mendelian Discovery* (London: Cassell and Company, 1911); G. Archdall Reid, *The Laws of Heredity* (London: Methuen & Co., [1910]); Leonard Doncaster, *Heredity in the Light of Recent Research* (Cambridge: University Press, 1910); Bateson, *Mendel's Principles*; Thomson, *Heredity*; C. W. Saleeby, *Heredity* (London: T. C. & E. C. Jack, n. d. [1905 or 1906]); Robert Heath Lock, *Recent Progress in the Study of Variation, Heredity, and Evolution* (London: John Murray, 1906); R. C. Punnett, *Mendelism* (Cambridge: Macmillan and Bowes, 1905).

⁸⁷ Thomas Hunt Morgan, *Heredity and Sex* (New York: Columbia University Press, 1913); Thomas Hunt Morgan, *Experimental Zoölogy* (New York: Macmillan Company/London: Macmillan & Co., 1907).

Internal Secretions and Changes of Sex

The introduction of this thesis outlined how historians have long described the highly gendered assumptions and prejudices that shaped the discovery of “internal secretions” (hormones) and the early development of endocrinology. The earliest hormonal association to homosexuality was made by Otto Weininger. In an unpublished thesis titled *Eros und Psyche: Eine biologisch-psychologische Studie* (“Eros and Psyche: A Biological and Psychological Study” (1901)) Weininger wondered why organotherapists had not thought of administering sex-gland extracts in cases of homosexuality. *Eros und Psyche* found only modest support among other Viennese intellectuals. Hoping for a favourable recommendation to a publisher, Weininger showed the work to Sigmund Freud who was less than impressed with it, apparently telling Weininger that “the world does not want thoughts but proof!”⁸⁸

Weininger, however, was no stranger to experimentation. From personal letters it is evident that he attempted experiments with testicular extract, most likely on himself, to verify his theory of homosexuality. In April 1901 he wrote to a friend: “My agent to combat homosexuality seems to be successful!! Even though this is only a confirmation of my own theory, I still haven’t recovered from my amazement. If only I could be sure that no suggestion is involved. . . . In any case, the doses must be continued. . . . My patient is already preparing for his first coitus!”⁸⁹ In *Geschlecht und Charakter*, Weininger maintained a role for internal secretions which acted on the cells of the body as “the final determining condition under the influence of which

⁸⁸ Chandak Sengoopta, “Science, Sexuality, and Gender in the *Fin de Siècle*: Otto Weininger as Baedeker,” *History of Science* 30, no. 3 (1992): 249-79, 272, n. 12.

⁸⁹ Cited in *ibid.*, 266. Sengoopta’s translation.

the cell acquires its final determinate character as male or female”, although he made no further allusion to the experiments with testicular extract that he had conducted.⁹⁰

The next published exposition of a biochemical explanation of homosexuality came from the German psychiatrist Iwan Bloch. In his book *Das Sexualleben unserer Zeit in seinen Beziehungen zur modernen Kultur* (1907), made available to British readers of sexology through the 1908 English translation *The Sexual Life of Our Time in Its Relations to Modern Civilization*, Bloch dismissed as inadequate the theories of the sexologists Richard von Krafft-Ebing and Magnus Hirschfeld, pointing out that a sexual intermediary stage between male and female would, if anything, produce bisexuality rather than homosexuality. Bloch was aware of a great many virile men who had no traces of femininity about their being yet were, nonetheless, homosexual in their erotic desires. Bloch therefore posited a new theory of homosexuality based on “changes in the chemistry of sexual tension” that operated independently of the reproductive glands and of the genitals. Bloch based this theory on observations of “the enduring chemical influence of the ovaries and the testicles” on the masculine and feminine nature of the body, first reported in 1905. Bloch stated that “the nature of this sexual chemistry is still entirely obscure” but felt sure that it offered great potential in solving “the riddle of homosexuality . . . better, and, above all, more scientifically than earlier theories.”⁹¹

For his part, Hirschfeld was also drawn to the explanatory potential of the newly posited internal secretions. He was influenced by the German evolutionary biologist Ernst Haeckel whose theory of monism had claimed that an “erotic chemotropism” or intricate chemical interaction was “the very source of love”. Developing Haeckel's theory further, Hirschfeld assumed that internal

⁹⁰ Weininger, *Sex and Character*, 16.

⁹¹ Bloch, trans. Paul, *Sexual Life of Our Time*, 530-35.

secretions were the motivators of love and sexual feelings. As early as 1912, he hypothesised that masculine and feminine sexual desire were engendered by hypothetical chemical substances which he termed Andrin and Gynäcin respectively. In 1914 he suggested that male homosexuality might be caused by a deficiency of Andrin.

Biologists in Britain, the United States, and on the Continent had little time for such theoretical musings but nonetheless grappled with ways to reconceptualise the variations of sex in endocrinological terms. Some of the most significant sexological studies of “internal secretions” by British scientists related to the phenomenon of avian sex transformation. On this score, they could, and did, stake claim to some enviable historical pedigree. In 1780, the eminent Scottish surgeon and naturalist John Hunter had published a seminal article on the subject in the Royal Society’s *Philosophical Transactions*, initiating a protracted discourse on variations of secondary sexual characteristics in non-human and human subjects alike that spanned the nineteenth century.⁹² In the article he described several examples of wild pheasant hens that had assumed male-typical plumage. He also described a peahen with a full-sized eye-feathered tail that was preserved in the collection at Ashton Lever’s famous museum, or Holophusikon, in Leicester Square. In life, the bird had astonished its doting owner, Lady Tynte (of Halswell House in Goathurst, Somerset), by moulting and assuming male-typical plumage aged around eleven years. Hunter ascribed the phenomenon of sex transformation to the process of aging and freely extrapolated to remark on changes in secondary sexual characteristics in women.

⁹² On Hunter and avian sex transformation, see C. Barker Jørgensen, *John Hunter, A. A. Berthold, and the Origins of Endocrinology* ([Odense]: Odense University Press, 1971); Thomas R. Forbes, “John Hunter on Spontaneous Intersexuality,” *American Journal of Anatomy* 116, no. 1 (1965): 269-300. See also Brooks, “Queer Birds.”

Occurrences of sex transformative birds continued to interest hunters, agriculturalists, naturalists, experimental biologists, and physicians alike in Britain and elsewhere through the century following Hunter's study. During the late-nineteenth- and early-twentieth centuries several descriptions appeared in British scientific literature. In March 1897, for example, the *Ibis* reported that a Mr J. G. Millais exhibited a pheasant, a widgeon, and some common redstarts—all of which were males that had assumed female-typical plumage—to the British Ornithologists' Club.⁹³ Demonstrating that observations of avian sex reversal in nature did not necessarily prompt sympathy or discourses of naturalisation, ornithologist G. H. Storer discussed female birds that had assumed male-typical plumage in an article titled "Freaks among the Pheasants" in the *Badminton Magazine of Sports and Pastimes* in March 1900. Such type of occurrence, he wrote, "always calls for comment amongst sportsmen".⁹⁴ "Elderly hen pheasants," he continued, "and such as have ceased to lay, are especially liable to become freaks of this kind, and individuals may be met with showing every degree of change, from the hen with a few metallic feathers in the neck, to one so completely clad in male attire as to be hardly distinguishable, save by her smaller size, from her former lord and master."⁹⁵ G. B. Corbin described a female duck with male-typical plumage in the *Zoologist* in 1902.⁹⁶ The *Field* published a couple of notable contributions, including an account of "Incomplete Hermaphroditism in a Fowl" in November 1909 and a thorough

⁹³ J. G. Millais, ["Mr. J. G. Millais exhibited ..."], *Ibis* seventh series 3 (1897): 438.

⁹⁴ G. H. Storer, "Freaks among the Pheasants," *Badminton Magazine of Sports and Pastimes* 10 (1900): 326-38, 330.

⁹⁵ *Ibid.*, 332-33.

⁹⁶ G. B. Corbin, "Wild Duck: Female in Male Plumage," *Zoologist* fourth series 6 (1902): 195-96.

analysis of “Cock Pheasants Assuming Female Plumage” by H. Hammond Smith in February 1911.⁹⁷

The most substantial, and influential, studies of avian sex transformation were conducted by Charles Gabriel Seligmann (Seligman after 1914), an eminent physician, pathologist, and anthropologist, and Samuel George Shattock, a respected pathologist who was the pathological curator of the Museum of the Royal College of Surgeons (aka the Hunterian) between 1897 and 1924. Lisa Carstens makes some astute analysis of Seligmann and Shattock’s interest in sex transformation, highlighting how they evoked the principle of primordial hermaphroditism as means of contextualising the phenomenon and the ease with which a comparison was made between birds and humans.⁹⁸ Their studies are worth re-examining as Carstens’s analysis is based solely on a short report published in the *British Medical Journal* in 1901 (May 20), yet Seligmann and Shattock’s collaboration spanned several original publications between 1904 and 1914. Coming as it does before the American zoologist Frank Rattray Lillie’s famous studies on the freemartin, Seligmann and Shattock’s body of work on the new physiology of sex formed an important forerunner for subsequent research programmes on sex endocrinology, thereby constituting an integral part of the early disciplinary efforts that helped establish “reproductive” physiology, and its diverse and often socially challenging variations, as a relatively discrete field of biological study through the early years of the twentieth century.

Some indication of Shattock’s initial interest in sex physiology, and especially the new phenomenon of internal secretions, can be found in a report of a

⁹⁷ H. Hammond Smith, “Cock Pheasants Assuming Female Plumage,” *Field*, February 25, 1911, 384; “Incomplete Hermaphroditism in a Fowl,” *Field*, November 6, 1909, 830.

⁹⁸ Carstens, “Unbecoming Women.”

case of a double inguinal hernia in a forty-two-year-old man that Shattock described to a meeting of the Pathological Society of London and which was subsequently reported in the *British Medical Journal* (February 20, 1897).⁹⁹ What most interested Shattock about the case was the observation of highly developed groups of interstitial cells in the stroma of the patient's testicles, an observation that resonated with descriptions of cells found in the pancreas and which Edward Sharpey-Schafer thought produced internal secretions. The main aim of Shattock's paper was simply to call attention to the potential application of clinical evidence in cases of pathological anatomy; specifically, closer observation of the physical and psychological effects of bilateral castration in adult males.

Evidence of Seligmann's initial interest in sex variations may be gleaned from an article entitled "Sexual Inversion among Primitive Races," published in the American journal *Alienist and Neurologist* in January 1902. It is a rare contribution to the new sexology by an English sexologist other than Havelock Ellis. In this broad survey of reports of "sexual inversion and perversion" in indigenous societies, Seligmann largely drew from existing ethnographic literature, although he also referenced Albert Moll as well as Havelock Ellis and John Addington Symonds's *Sexual Inversion* (interestingly, Seligmann references the original German edition, possibly in an effort to avoid awkward questions about his engagement with a book that was banned in Britain).¹⁰⁰ There is little by way of analysis in the piece; Seligmann's aim appears to have been simply to refute a prevailing assumption "that

⁹⁹ S. G. Shattock, "Histological Characters of Testicle Removed in the Radical Cure of Hernia," *British Medical Journal*, February 20, 1897, 460.

¹⁰⁰ C. G. Seligmann, "Sexual Inversion among Primitive Races," *Alienist and Neurologist* 23 (1902): 11-15, 11.

abnormalities of the sexual instinct are the concomitants of Oriental luxury or advanced civilisation.”¹⁰¹

Seligmann and Shattock’s first joint investigations into the physiology of sex centred largely on elucidating the actions of the internal secretions of the testicles, especially their role in the development of secondary sexual characteristics. Observations of physical changes following castration had been made for millennia, but Seligmann and Shattock set about testing whether vasectomy would produce the same results. They thought that the pertinent secretions might originate in the interstitial cells which would be unaffected by excision of the vas deferens, but their experiments (conducted on various species of sheep and common fowl) simply set out to demonstrate that the discharge of semen was not connected to the development and transformation of male secondary sexual characteristics. Seligmann and Shattock extended their observations of sheep and fowl to humans, evoking the principle of primordial intersexuality to account for the coexistence of female and male structures. In their words: “The acquirement of external sexual characters common to the sexes is best harmonised by the theory of the common origin of sex through an hermaphrodite ancestry; such characters would seem to indicate the formation of an internal secretion by the testicle and ovary of a like kind, and in this degree point to a common function of the sexual glands.”¹⁰²

Seligmann and Shattock’s subsequent study, published in the *Transactions of the Pathological Society* in 1906, concerns a specimen, an intersexed Leghorn fowl,

¹⁰¹ Ibid.

¹⁰² S. G. Shattock and C. G. Seligmann, “Observations upon the Acquirement of Secondary Sexual Characters, Indicating the Formation of an Internal Secretion by the Testicle,” *Transactions of the Pathological Society of London* 56 (1905): 57-80, 79. See also S. G. Shattock and C. G. Seligmann, “Observations upon the Acquirement of Secondary Sexual Characters, Indicating the Formation of an Internal Secretion by the Testicle,” *Proceedings of the Royal Society of London* 73 (1904): 49-58; S. G. Shattock, “The Nature of the So-called Dermoid Cyst of the Ovary and Testicle,” *British Medical Journal*, November 5, 1904, 1248.

which, they argued, was a rare case of “true hermaphroditism”.¹⁰³ Externally the specimen exhibited fully developed comb and wattles, the spurs of a cock, and the tail of a hen. Internally, the bird had a testicle on its right side and a larger, hermaphrodite gland on the right. Seligmann and Shattock aligned the extraordinary specimen with the phenomenon of avian sex transformation and sought to revitalise the discourse on the phenomenon firstly by giving it a scientific name—allopterotism (from the Greek ἄλλος, ‘other,’ and πτερωτός, ‘feathered’)—and then by offering a more sophisticated analysis which admitted the possible action of internal secretions.

Based on their review of some selected (all British) published descriptions, as well as their own original observations of specimens in the Museum of the Royal College of Surgeons, they concluded:

The hypothesis that the change in external sexual characters is due to the atrophy of the ovary and a consequent loss of ovarian function, we regard as inadequate and unsatisfactory, chiefly for the reason that the transformation is not a retrogression, but a progression from a less to a more highly differentiated condition. The hypothesis which we submit, and which we are at present engaged in testing, is that such birds are really bisexual or hermaphrodite—either that the single gland, the “ovary,” is bisexual, as in the hermaphrodite fowl described in this communication, or that the sexual gland is paired, one of the paired organs being male and the other female, or that the male element is misplaced and possibly included within a neighbouring viscus like the adrenal or kidney. As age advances, the female gland or the female element of the composite gland retrogrades, upon which the male element, until then quiescent, proceeds to functionate, and with this there comes the striking external transformation in the secondary sexual characters of the bird.¹⁰⁴

¹⁰³ S. G. Shattock and C. G. Seligmann, “An Example of True Hermaphroditism in the Domestic Fowl, with Remarks on the Phenomenon of Allopterotism,” *Transactions of the Pathological Society of London* 57 (1906): 69-109. See also S. G. Shattock and C. G. Seligmann, “An Example of Incomplete Glandular Hermaphroditism in the Domestic Fowl,” *Proceedings of the Royal Society of Medicine* 1, Pathological Section (1908): 3-7; S. G. Shattock and C. G. Seligmann, “True Hermaphroditism in the Fowl,” *British Medical Journal*, May 20, 1905, 1092-93; “[Mr. Shattock and Dr. C. G. Seligmann exhibited ...],” *Lancet*, May 27, 1905, 1422.

¹⁰⁴ Shattock and Seligmann, “An example of True Hermaphroditism,” 101.

The greater or lesser degree of change in glandular function, Seligmann and Shattock argued, accounted for the various grades of allopterotic transformation that were reported in the wide-ranging literature on the phenomenon.

Seligmann and Shattock also described occurrences of male-to-female transformations in birds, including the phenomenon of henny game and “eclipse plumage” in ducks, prompting some rampant, and racist, anthropomorphism in the process. Their discussion of henny game, for example, ran slickly into a discussion of human males. “With such an absence from the male of birds,” they wrote, “of what is commonly the external sexual character, we may associate the fact that amongst certain races of mankind the male is quite devoid, or almost so, of hair on the face, although that of the scalp may be luxuriant.” They continued:

The male under such circumstances externally resembles the female, much as the henny cocks resemble the hens in the breed of fowls referred to. This, as is well known, is the case in the straight-haired North-American aborigines, in whom the hair of the head is as long in the male as in the female, and may in certain cases attain the length of two metres, whilst the face is practically hairless. In a lesser degree this is true of the straight-haired Mongols, amongst whom the men have hardly more than a rudimentary tuft of beard, although the hair of the scalp is of undiminished length.¹⁰⁵

They also extended their analysis to a review of reports of hermaphroditism in reptilians, amphibians, fish, and cyclostomata. So too did they extend their analysis of non-human subjects to humans:

Hermaphroditism, far from being a phenomenon altogether abnormal amongst the higher vertebrates, then, should be viewed, we submit, rather as a reversion to the primitive ancestral phase in which bisexualism was the normal disposition. The apportioning of male and female function to different individuals would, on this view, arise as a later phenomenon in the progress of evolution.

¹⁰⁵ Ibid., 91.

That such a disposition is the primitive one appears from the striking circumstance that in the highest form, the human, both sets of sexual passages are developed in the embryo, and that the reproductive glands in the early phases of development, are undifferentiated from one another.

The philosophical explanation of this morphological truth can hardly be other than that the human form is descended through an hermaphrodite ancestry.¹⁰⁶

Seligmann and Shattock further extended their analysis into the realm of sexual behaviour. For example, discussing occasional transience of allopterotic change, they observed a temporary change in the sexual behaviour of a wild duck that was concomitant with a temporary assumption of the plumage of a mallard. They reported: “During, and for a few months after this physical change, the bird courted and went through the action of treading another duck in captivity with her precisely as a mallard would have done, whilst she, moreover, avoided the attentions of a mallard to whom she remained alluring in spite of her change in plumage.”¹⁰⁷ Again, Seligmann and Shattock explicitly related their observations to humans, albeit as something of a cliffhanger at the very end of their article:

But the occurrence of true hermaphroditism in man being established, the question arises whether lesser grades do not occur, and whether the fairly common cases in which the human female, after the cessation of menstruation, acquires hair on the face, may not indicate that the retrogression of the ovaries has been succeeded by the progression of some quiescent male tissue.

Still more remote evidence of bisexuality in the human subject may, perhaps, be afforded by the psychical phenomenon of sexual perversion and inversion met with amongst both civilised and savage people.¹⁰⁸

¹⁰⁶ Ibid., 108.

¹⁰⁷ Ibid., 87. A footnote reads: “We are aware that ducks in general are particularly indiscriminate in their sexual approaches; the regularity of psychical perversion, however, in allopterotic ducks constitutes a phenomenon not to be ignored in connection with the problems under consideration.” Ibid.

¹⁰⁸ Ibid., 108-9.

In this way, Seligmann and Shattock brought their study in close juxtaposition to sexological works such as Ellis's *Sexual Inversion*, but without explicitly stating so. Although they did not make a specific association between sexual inversion and internal secretions, the inclusion of the subject at the end of their paper was nonetheless suggestive and, indeed, indicative of the general direction in which the emerging endocrinology of sex was heading.

Seligmann and Shattock's contributions to the new biology of sex were widely reported in the medical press. Demonstrating just how closely the new "reproductive" physiology was aligning with modernist sexology, Havelock Ellis picked up where the two biologists had so provocatively concluded their study on "true hermaphroditism" in one of his periodic reviews of continental sexological works for the *Journal of Mental Science*. In the January 1907 edition, he reviewed an article titled "Einige psychiatrische Erfahrungen als Stütze für die Lehre von der bisexuellen Anlage des Menschen" (Some Psychiatric Experiences in Support of the Doctrine of Human Bisexuality) that was published in the 1906 volume of Magnus Hirschfeld's journal *Jahrbuch für sexuelle Zwischenstufen* (Yearbook for Intermediate Sexual Types). Its author was Paul Näcke, a physician at the Hubertusburg insane asylum in Saxony and a significant contributor of German sexological and criminological studies. Näcke did not believe that homosexuality was pathological per se or that homosexuals were degenerates, but nonetheless considered that some cases of psychiatric patients who showed homosexual tendencies offered support for the existence of a latent, organic bisexuality in all human beings. In Ellis' words, "in a few cases [this] comes to the surface in various

more or less pronounced degrees, moulding the instincts and impulses”.¹⁰⁹ To his sketch of Näcke’s article, which was typical for German sexology but still radical in Edwardian Britain, Ellis appended a description of Shattock and Seligmann’s study of domestic fowl with the words: “it may here be added, that this theory also finds support in an investigation recently issued from a very different quarter.”¹¹⁰ By juxtaposing their studies on “alloppterotism” in domestic fowl with the promotion of organic bisexuality, Ellis resolutely associated Shattock and Seligmann’s work with continental sexology.

Various other British biologists made significant contributions to the new biology of sex, their studies most commonly concerning avian sex reversal. For example, following Shattock and Seligmann, C. E. Walker of the Cancer Research Laboratories at the University of Liverpool, conducted experiments on fowl to further determine the hormonal action of the testes upon secondary sexual characteristics.¹¹¹

In common with, and alongside, the burgeoning literature on heredity and genetics, the rapid development of endocrinology engendered a new genre of modernist sexological writing. Formative in this regard was F. H. A. Marshall’s *Physiology of Reproduction*. The penultimate chapter, titled “The Factors which Determine Sex”, traverses a range of topics from sex determination to homosexuality. By 1910 many dozens of individual studies probed sex-determining mechanisms across diverse species. At the top of the chapter, Marshall nodded to Thomas Hunt Morgan’s discussion of the subject in *Experimental Zoölogy* as the

¹⁰⁹ Havelock Ellis, review of “Einige Psychiatrische Erfahrungen als Stütze für die Lehre von der Bisexuellen Anlage des Menschen,” *Jahrbuch für sexuelle Zwischenstufen*, by Paul Näcke, *Journal of Mental Science* 53, no. 220 (1907): 178-79, 178.

¹¹⁰ Ibid.

¹¹¹ C. E. Walker, “The Influence of the Testis upon the Secondary Sexual Characters of Fowls,” *Proceedings of the Royal Society of Medicine* 1 (Pathological Section) (1908): 153-56.

most authoritative account of the subject, but Marshall's subsequent narrative made some unique innovations. Surveying prevailing theories of sex determination, he proffered a three-group division: theories that assumed that the physical sex of offspring was determined following fertilization during larval or foetal development; theories which assumed that the sex of offspring was determined prior to, or at the moment of, fertilization; and those theories which held that sex was not determined at any particular period, or at different periods in different animals. Under the heading "Hermaphroditism and Sexual Latency", Marshall proceeded to discuss the occurrence of intersexuality both as a regular state for certain organisms and its unusual manifestations in sexually dimorphic species, including humans. Following Castle, Heape, and others, Marshall gave credence to the idea that all animals and plants were essentially hermaphrodite, containing the potential characters of both sexes but usually manifesting the characteristics of one sex with the characteristics of the other remaining in a latent or imperfect state. Aside from recent experiments that had induced the development of such latent sex characters across a range of species (including certain plants, the hermit crab, and molluscs), Marshall also believed the principle was further evidenced by the fact that characteristics of one sex could be transmitted to offspring by the other sex.

Marshall's most striking source, cited approvingly following his discussion of Darwin and Wallace, is the 1906 English translation of *Sex and Character*. Marshall was not altogether convinced by Weininger's "idioplasm" theory ("somewhat too morphologically conceived"), but he thought it was useful as it emphasised that both female and male coexisted, albeit unequally developed, in most if not all dioecious individuals; "that is to say," he wrote, "that such individuals are rarely, if ever, wholly male or wholly female." He continued:

Weininger draws special attention to the gradations in sexual characters which exist among men and women. There are many men, he remarks, with a poor growth of beard and a weak muscular development, who are otherwise typically males; and so also there are women with ill-developed breasts who in other respects are typical females. There exist all transitional forms from the most masculine male to the most effeminate male, and on the other side, from the Sapphist and the virago to the most feminine female; but in Man the characters of one sex are always dominant, though the degree of dominance varies through considerable limits. On this view, the phenomena of so-called sexual inversion and homosexuality, which are ordinarily regarded as purely pathological, are in reality psychological manifestations of special characters belonging to the recessive sex.¹¹²

A footnote to the paragraph guided readers to some more of those sexological treatises that were available in English: Iwan Bloch's *The Sexual Life of Our Time*; Havelock Ellis's *Sexual Inversion*, Auguste Forel's *The Sexual Question*; and Richard von Krafft-Ebing's *Psychopathia sexualis*.

Marshall's nod to the major sexologists, presented as an integral part of his survey of the major theories of sex differences—from Darwin to Morgan—is a significant moment in the development of sexological discourse in Britain. It was the first time that Ellis and some of the major continental sexologists were given explicit and authoritative endorsement by a leading British biologist. It signals the end of a protracted era of standoffishness towards continental sexology by British physicians and scientists and is another factor that situates Marshall's *Physiology of Reproduction* as an important text of modernist sexology. The broad range of sex-related topics he broaches in his chapter on sex determination were all woven into a broad narrative of the phylogeny and ontogeny of sex differences. Unifying the development of sex characteristics across most, if not all, living organisms, the existence of an essential hermaphroditism accounted for a broad range of sex-related

¹¹² Francis H. A. Marshall, *The Physiology of Reproduction* (London: Longmans, Green and Co., 1910), 655.

phenomena including the development of primary and secondary sex characteristics, the hereditary transmission of those characteristics, sex transformations (sex reversal), and homosexuality. All these phenomena were thus structured into the new “physiology of reproduction”, as it was pioneered in Britain, from its outset.

Following Marshall’s *Physiology*, major works by British biologists on the new science of “internal secretions” include *Internal Secretion and the Ductless Glands* (1912, 3rd ed. 1924) by Swale Vincent and Schäfer’s *An Introduction to the Study of the Endocrine Glands and Internal Secretions* (1914) and *The Endocrine Organs: An Introduction to the Study of Internal Secretion* (1916; 2nd ed. 1924-1926).¹¹³ English translations of major continental works include the Vienna-based Hungarian pathologist Artur Biedl’s *Innere Sekretion: Ihre physiologischen Grundlagen und ihre Bedeutung für die Pathologie* (1910), published in English with an introduction by the English physician Leonard Williams as *The Internal Secretary Organs: Their Physiology and Pathology* in 1912, and *The Internal Secretions: Their Physiology and Application to Pathology* (1918), a translation of *Les sécrétions internes: Principes physiologiques applications à la pathologie* (1914) by the French endocrinologist Eugène Gley.¹¹⁴

In common with the new genre of science writing on Mendelism that proliferated through the same period, the first texts that sought to elucidate “internal secretions” contained within them a new kind of sexological writing that focussed heavily on the curiosities and variations of sex. The early reliance on the major

¹¹³ Swale Vincent, *Internal Secretion and the Ductless Glands* (London: Edward Arnold, 1912); Edward Schäfer, *An Introduction to the Study of the Endocrine Glands and Internal Secretions: Lane Medical Lectures, 1913* (Stanford University, 1914); Edward A. Schäfer, *The Endocrine Organs: An Introduction to the Study of Internal Secretion* (London: Longmans, Green, and Co., 1916).

¹¹⁴ Eugène Gley, *The Internal Secretions: Their Physiology and Application to Pathology*, trans. Maurice Fishberg (London: William Heinemann, 1918); Arthur Biedl, *The Internal Secretary Organs: Their Physiology and Pathology*, trans. Linda Forster (London: John Bale, Sons & Danielsson, [1910] 1912).

sexologists demonstrated by Marshall and others was quickly dropped. Even as they continued to perpetuate key sexological ideas (such as the principles of primordial hermaphroditism and latent sex), the new endocrinologists rapidly developed their own style of sexological reasoning, rendering the older or “classical” sexologies of Bloch, Ellis, Weininger, and other major sexologists ever more outmoded. This important shift in sexological mores is charted in detail in the following chapter.

2. Sexual Transitions, 1910-15

In letzter zeit mehren sich die Zeichen, daß auch in England die starke Mauer scheinheiliger Voreingenommenheit, die zwischen der theoretischen Wissenschaft und der praktischen Befolgung ihrer Errungenschaften steht, ein wenig ins Wanken gerät. Es ist auch kaum anders denkbar, daß die Saat, die Westermarck, Ellis, Carpenter und vor allem Darwin ausgestreut haben, über kurz oder lang selbst auf dem steinigen Boden Englands Früchte zeitigen wird.

—Magnus Hirschfeld, *Die Homosexualität des Mannes und des Weibes* (1914)¹

In recent times, signs have been increasing that also in England the strong wall of hypocritical prejudice, which stands between theoretical science and the practical following of its findings, is beginning to crumble a little. It could not but be that the seeds which Westermarck, Ellis, Carpenter, and especially Darwin sowed would sooner or later bear fruit even in the stony earth of England. (Trans. Michael A. Lombardi-Nash)²

There is palpable frustration in Magnus Hirschfeld's 1914 account of homosexuality in Edwardian England, frustration that was undoubtedly experienced by innumerable people who lived in or visited the country at the time. On the one hand, he wrote that many well-travelled homosexuals ("Urnings") considered Britain "das homosexuellste Land der Welt sei" (the most homosexual country in the world).³ He described Marble Arch in London as "[e]iner der größten Sammelplätze internationalen Urningtums" (one of the largest gathering spots of international

¹ Magnus Hirschfeld, *Die Homosexualität des Mannes und des Weibes* (Berlin: Louis Marcus, 1914), 549-50.

² Magnus Hirschfeld, *The Homosexuality of Men and Women*, trans. Michael A. Lombardi-Nash (New York: Prometheus Books, [1914/1920] 2000), 623.

³ Hirschfeld, *Homosexualität*, 546; Hirschfeld, trans. Lombardi-Nash, *Homosexuality*, 620. On Hirschfeld, see, for example, Heike Bauer, *The Hirschfeld Archives: Violence, Death, and Modern Queer Culture* (Philadelphia: Temple University Press, 2017); Toni Brennan and Peter Hegarty, "Magnus Hirschfeld, His Biographies and the Possibilities and Boundaries of 'Biography' as 'Doing History,'" *History of the Human Sciences* 22, no. 5 (2009): 24-46; Ralf Dose, *Magnus Hirschfeld: The Origins of the Gay Liberation Movement*, trans. Edward H. Willis (New York: Monthly Review Press, [2005] 2014).

Urningdom) and wrote of other places where homosexuals met.⁴ On the other hand, Hirschfeld stated that homosexuals in England were afraid to speak a word to each other, even with sexual partners. He also related how a courageous individual attempted to talk about homosexuality objectively and seriously at Speakers' Corner in Hyde Park, but was mocked by the public and chased by the police. He continued:

Das ist England, das noch in unseren Tagen seinen glänzendsten dichter die Tretmühle treten ließ für eine Handlung, die täglich dort Tausende ungestraft begehen, England, das einem Havelock Ellis die Herausgabe seiner streng wissenschaftlichen psychosexuellen Studien in der Heimat unmöglich machte, ja, dessen Britisches Museum sich weigert, sie auch nur in seinem Katalog aufzuführen; England, in dem auch die von einem ärztlichen Kollegen verfaßte Übersetzung meiner „Geschlechtsübergänge“ nicht erscheinen konnte, dessen Privatgesellschaften, einschließlich der „so-parties“ aber nur zu oft in ungezügelte Orgien ausarten, bei denen der Entblößungs- und Schautrieb in gleicher Weise befriedigt wird, und in dem einmal ein Mediziner, mit dem ich die homosexuelle Frage erörterte, antwortete: „Hier kann man selbst mit Ärzten oder Juristen nicht über die sexuelle Frage sprechen, entweder haben sie einen Ekel oder einer Erektion.“⁵

That is England, which even in our days allows its poets to walk the treadmill for an act that thousands perform there daily; England, which made it impossible for Havelock Ellis to publish his clearly scientific, psychosexual studies in his own country, whose staff at the British Museum refuse to list his studies even in its catalog; England, where my *Geschlechtsübergänge* (*Sexual Transitions*), even if translated by a medical colleague, could not be published; England, whose private clubs, including “so-parties,” only too often get out of control and end in unrestricted orgies and at which exhibitionists and voyeurs are gratified in a similar way; England, where a physician with whom I had once discussed the homosexual question answered, “Here, you can’t talk about the sexual question even with doctors or lawyers; they either get disgusted or get an erection.”⁶

⁴ Hirschfeld, *Homosexualität*, 547; Hirschfeld, trans. Lombardi-Nash, *Homosexuality*, 620.

⁵ Hirschfeld, *Homosexualität*, 547-48.

⁶ Hirschfeld, trans. Lombardi-Nash, *Homosexuality*, 621. Italics in original text. Non-native narratives of sexualities in Britain largely remain untapped resources in histories of sexualities in Britain. Aside from Hirschfeld’s useful account, see, for example, I. L. Pavia, “Die männliche Homosexualität in England, mit besonderer Berücksichtigung Londons [Male Homosexuality in England with Special Regard to London],” *Jahrbuch für sexuelle Zwischenstufen* 10 (1909): 362-78; 11 (1910): 18-51, 397-408; 12 (1911): 32-49, 166-81; 297-316.

Hirschfeld's remarks are a useful springboard from which to continue analysing the transformation of medico-scientific approaches to the discussion and theorisation of sex differences and sexualities. This transformation is discernible, as Hirschfeld perceived, among scientists in Britain, within the country's medical profession, as well as in its newspapers, both as it emerged in the early years of the twentieth century and as it continued to shape sexual knowledge and practices thereafter. Following on from the previous chapter, which charted the earliest emergence of new genres of sexological endeavour founded on endocrinology and genetics, this chapter examines how the new biology of sex became firmly established in late-Edwardian Britain, superseding the contributions of the major late-nineteenth- and early-twentieth-century sexologists such as Havelock Ellis and Hirschfeld both in terms of medico-scientific explanatory power and in terms of wider cultural currency.

To a certain extent it therefore contradicts Hirschfeld's somewhat partial account regarding how these changes were brought about and by whom, or at least looks beyond his own singular perspective. The chapter argues that while the impact of Charles Darwin and that of homophile sexological writers such as Edward Carpenter, Havelock Ellis, and Edvard Westermarck, as well as of Hirschfeld himself, continued to be felt in Britain through the era, they were superseded by a new kind of biologist who offered innovative, modernist explanations of sex differences and sexualities by recourse to the actions of the "sex" chromosomes and hormones, thereby driving a burgeoning of elite and popular interest in the biology of sex determination and sex development.

The first section of the chapter looks closely at a constellation of events around 1913/14 that collectively demonstrate the growing impact of the new biology of sex in late-Edwardian Britain, or at least highly selective accounts of it. The

section describes a visit to London in 1913 by Hirschfeld, at the height of his fame in Germany (and, increasingly, globally) as a leading sexologist and sexual rights campaigner. Coincidentally or otherwise, it was just following the time of Hirschfeld's visit that biologists in Britain began to forge an especially British—one might say establishment or even Oxbridge—sexology. They did so by purposefully seeking to style the new “reproductive” physiology, including studies of sex variations, as a leading concern of modernist British science, while at the same time assiduously avoiding the liberationist agendas of sexologists such as Ellis, Hirschfeld, and their interlocutors. Thus purged, the new biology of sex was rendered palatable on a grand scale, affording it a level of elite and popular acknowledgement, dissemination, and acceptance that the major sexologists never achieved in early-twentieth-century Britain. Still, however, Ellis produced a third and final edition of *Sexual Inversion* in 1915 which incorporated key elements of the new sexological biology, not least Seligmann and Shattock's studies of sex-transformative birds discussed in the previous chapter. These adaptations to Ellis's text, as well as the emergence of new popular sexological texts around the same time, are examined in the second section of the chapter.

Ellis worked to embrace the new biology of sex, but British biologists made little attempt to reciprocate. The early acknowledgement of sexologists such as Ellis and Weininger was largely dropped after 1910, as the genetics and endocrinology of sex were rapidly developed in Britain and elsewhere under the rubric of “reproductive” physiology, conceptualising and describing sex variations in new biological terms with little recourse to non-biologists. As discussed in the previous chapter, the first modern biologists who concerned themselves with sex-related questions—chief among them William Ernest Castle, Walter Heape, and F. H. A.

Marshall—had sought to establish continuities with older sexological concepts and rhetoric, especially those inherited from Darwin. The principle of primordial or essential hermaphroditism, with concomitant notions of sexual latency, maintained a striking presence in their models of sex differentiation. However, the new genetics of sex, in particular, rapidly gained its own momentum, rhetoric, and conceptual premises that fundamentally changed how sex was conceived in biological terms. New Mendelian concepts and jargon, such as ‘heterozygosity,’ ‘hybridity,’ ‘correlated differentiation,’ ‘hereditary transference,’ ‘gynandromorphs,’ ‘mosaics,’ and ‘intersexuality,’ rendered the older and more generalised concept of ‘hermaphroditism’ increasingly unsophisticated and archaic.

Sex variations, including ever more explicit discussions of sexual inversion/homosexuality, remained pivotal to the pursuit of genetics and endocrinology, creating tensions and contradictions with hegemonic gender and sexual norms that continued to shape sexological biology well into the post-Second World War era. The third section identifies a couple of ways in which the specific issue of same-sex sexual behaviour became more definitely embroiled with Mendelian genetics in late-Edwardian Britain, without reference to the major sexologists. It discusses Rose Haig Thomas’s studies of ‘sex hybridism’ in pheasants, an influential body of research that rendered overly simplistic models of sex development ineffectual and helped establish sex variations as pivotal, practically and conceptually, as the explanatory power of genetics continued to grow apace. The section further highlights how the Scottish gynaecologist David Berry Hart worked to accommodate a variety of sex “inversions,” including homosexuality, within a complex and idiosyncratic Mendelian schema while simultaneously maintaining that true hermaphroditism did not exist in humans.

As with Walter Heape's profoundly sexist attitudes towards suffragettes, discussed in the previous chapter, there is little indication that the attribution of Mendelian, chromosomal, and endocrinological dynamics to sex variations engendered discourses of normalisation or other modes of scientific legitimisation among the biologists who studied them, a stark difference to the polemical sexologies of Ellis, Hirschfeld, and other major sexologists. For most scientists of the era, the elucidation of biological mechanisms underlying any socially undesirable trait was pursued as a step towards the wilful eradication of such traits from the population. From the outset, modern genetics was inextricably associated with eugenic ideas and practices, in Britain and elsewhere. These offset suggestions that the naturalising and normalising of socially, politically, and legally proscribed sexual characteristics and behaviours could be justified by scientific, biological explanation. The fourth section of the chapter looks at the complex associations between the new biology of sex with eugenics as it played out in Britain. In doing so, it draws attention to the Oxford biologist Geoffrey Smith, whose study of crustacea and their parasites led him to an address to the Eugenics Education Society on the "disharmonies" of sex in human and non-human animals alike.

Magnus Hirschfeld in London and Transformations of Sex at the Hunterian

For Hirschfeld, it was a sign of greater tolerance towards medico-scientific appraisals of homosexuality in England—"Ein vielversprechender Anfang" (a very promising start)—that he was allowed to exhibit a display entitled "Sexual Transitions" as part of the seventeenth meeting of the International Congress of Medicine. This was a

massive gathering of scientists and medical professionals held in London between August 6 and 13, 1913.⁷ It was not Hirschfeld's first visit to Britain. In *Die Homosexualität des Mannes und des Weibes*, he wrote that he had visited England and Scotland three times to conduct studies, guided by British experts.⁸ Aside from his involvement with the London Congress in 1913, the circumstances of these visits are barely known. According to his first biographer Charlotte Wolff, Hirschfeld visited London in early 1910.⁹ In an autobiographical piece, originally published in the German homophile journal *Die Freundschaft* in 1922-23, Hirschfeld mentioned that he had once stayed in the rooms of the noted queer English political scientist and philosopher Goldsworthy Lowes Dickinson at King's College, Cambridge.¹⁰ Hirschfeld's attendance at the 1913 London Congress was, however, the first time that he personally promoted his theory of sexual intermediates to physicians and scientists in Britain.

Two museums were staged as part of the Congress. One was the Museum of the History of Medicine, presented at 54a Wigmore Street by the wealthy pharmacist and philanthropist Henry Solomon Wellcome. The other, which contained Hirschfeld's exhibit, was a Medical Museum, housed at the Imperial Institute of Science and Technology (Imperial College London) and curated by a committee chaired by the eminent Scottish anatomist Arthur Keith, conservator of the Museum of the Royal College of Surgeons (aka the Hunterian). Hirschfeld's display was situated within the section "Anatomy and Embryology," the president of which was

⁷ Hirschfeld, *Homosexualität*, 550; Hirschfeld, trans, Lombardi-Nash, *Homosexuality*, 623.

⁸ Hirschfeld, *Homosexualität*, 546; Hirschfeld, trans, Lombardi-Nash, *Homosexuality*, 620.

⁹ Charlotte Wolff, *Magnus Hirschfeld: A Portrait of a Pioneer in Sexology* (London: Quartet Books, 1986), 106.

¹⁰ Magnus Hirschfeld, *Von Einst bis Jetzt: Geschichte einer homosexuellen Bewegung 1897-1922*, ed. Manfred Herzer and James Steakley (Berlin: Rosa Winkel, 1986), 185.



Fig. 2. Image of Magnus Hirschfeld's "Sexual Transitions" display as it existed in Hirschfeld's Institut für Sexualwissenschaft. From *Arbeiter-Illustrierte-Zeitung*, May 23, 1928.

the Oxford anatomist and anthropologist Arthur Thomson (not to be confused with the Scottish naturalist J. Arthur Thomson, co-author of *The Evolution of Sex*). Within this broad category, Hirschfeld's exhibit was part of a group of displays included within the remit of "Abnormal Development." The display included an impressive series of photographs illustrating various stages of intermediary sexual types, of which Hirschfeld considered homosexuals to be a mild variety, as well as several wax models shaped from the genitals of hermaphrodites (Fig. 2). Hirschfeld also gave public lectures as part of his contribution to the Congress, accompanied by lantern slides.

Rainer Herrn has discussed Hirschfeld's exhibition display, which originated with the London Congress and was then transferred to Hirschfeld's pioneering Institut für Sexualwissenschaft (Institute for Sexology) in Berlin, where it continued

- Lent by:*
Privatdoz Dr. S. J. Lange,
Amsterdam.
- 277 Reconstruction model of the opossum
(*Didelphis Marsup.*)
(The above illustrating the philo-
genetic development of the corpus
striatum.)
- 278 Reconstruction model of the cerebellum
of a reptile.
- 279 Idem.
- 280 Series of 12 coloured drawings illus-
trating the topography of the various
nuclei of the medulla oblongata and
of the mesencephalon in five varieties
of vertebræ.
- 282 Series of 10 drawings showing the
development of the sulci and their
relation to certain cell arrangements

IV.—ABNORMAL DEVELOPMENT.

- Dr. Magnus Hirschfeld,
Berlin.
- 302 Wax model of true hermaphroditism
(double sexual qualities).
- 303 Wax model of true or inverted her-
maphroditism (premature development
of male and female sexual qualities).
- 304 Wax model of inverted pseudo-her-
maphroditism (sex uncertain).
- 305 Wax model of masculine pseudo-her-
maphroditism (sex mistaken).
- 306 Wax model of masculine pseudo-her-
maphroditism (sex mistaken).
- 307 Wax model of masculine pseudo-her-
maphroditism (external genitals of
male simulating female sex).
- 308 Wax model of feminine pseudo-her-
maphroditism (external genitals of
female simulating male sex).
- 309 Wax model of feminine pseudo-her-
maphroditism (sex mistaken).
- 310 Wax model of pseudo-arthenia (a female
whose external genitals simulated
male sexual qualities).
- 311 Wax model of pseudo-arthenia (section
of the pelvis of a female whose
external genitals simulated male
sexual qualities).

- Lent by:*
Dr. Magnus Hirschfeld,
Berlin.
- 312 Wax model of kryptorchism and
testicular aplasia. Azospermia. In-
fantile (undeveloped testicles lying
in the inguinal canal. Absence of
sperm cells).
- 313 Wax model of a case of gynecomastia.
- 314 Series of lantern slides illustrating
to 388 various sexual transitional stages.
- 389 Series of photographs illustrating:
to (a) Feminine development in man.
403 (b) Masculine development in
woman. (Androgynia, gyn-
andria, gynecomastia, varia-
tions of pelvic development
and of growth of hair.)
- (c) Types of moral hermaphroditism
(Homosexuality and perverted
sexual sense).
- 404 Wall diagrams illustrating sexual tran-
sitional stages of the 1, 2, 3, 4 degree:
1 deg. Hermaphroditism and pseudo-
hermaphroditism.
2 deg. Androgynia and gynandria.
3 deg. Transversitism.
4 deg. Homosexuality and bisexuality.
- 405 Diagram illustrating curve of conduction
path.
- 405A Diagram illustrating curve of sexual
"stage" reflexes.
- 406 Three photographs illustrating a case of
duplication of the bladder, uterus,
vagina, and the vulva. A full-time
pregnancy and labour took place
successively in each uterus.

Dr. J. E. Gennell and
Dr. A. M. Paterson,
F.R.C.S., Liverpool.

Prof. J.
Belfast.

- 409 Life-size model of a series of horizontal
sections through the abdomen and
pelvis of an adult male (the model is
composed of a series of blocks of
wood), the plaster work being carried
out by Miss Iken, and the stand con-
structed under the superintendence of
Mr. J. Wyke, I.A.

**Fig. 3. Description of
Hirschfeld's "Sexual
Transitions" exhibit in
the *Catalogue* of the
seventeenth meeting of
the International
Congress of Medicine,
London (August 6-13,
1913). Wellcome Images.**

to be developed until the Institut was violently suppressed by the Nazis in May 1933.¹¹ The stand, along with Hirschfeld's large collection of photographs, were destroyed but Herrn was able to reconstruct the display as part of an exhibition he curated in 1993 from published photographs. A listing of exhibits in the *Catalogue* of Keith's Medical Museum (Fig. 3) provides some more detailed information about its contents and dynamics.¹² More than this, a notice in the *Berliner Börsen-Courier* (August 17, 1913), a left-liberal Berlin newspaper, provides more specifics about Hirschfeld's activities at the London Congress.¹³

In her biography of Hirschfeld, Wolff wrote that the Congress represented a turning point in his life and the autobiographical fragments she quotes support her contention.¹⁴ The two main texts in which Hirschfeld reflects on his time in London, where he stayed in 1913 at the plush Cecil Hotel on the Strand, paint a vivid picture of an important few days. That said, Wolff overstates the impact of Hirschfeld's endeavours at the Congress when she argues that "[t]hrough his contributions at the London congress, Hirschfeld's reputation as one of the foremost sexologists of the time became known worldwide."¹⁵ In *Die Homosexualität des Mannes und des Weibes* Hirschfeld remarked that the "Sexual Transitions" exhibit would not have been possible ten years earlier but "im Imperial college of science and technology des Interesse und der Anerkennung weiter Kreise zu erfreuen hatte" (which now

¹¹ Rainer Herrn, trans. Michael T. Taylor, "Magnus Hirschfeld's *Onnagata*," in *A Global History of Sexual Science, 1880-1960*, ed. Veronika Fuechtner, Douglas E. Haynes, and Ryan M. Jones (Oakland, CA: University of California Press, 2018), 374-97; Rainer Herrn and Michael Thomas Taylor, "Magnus Hirschfeld's Interpretation of the Japanese *Onnagata* as Transvestites," *Journal of the History of Sexuality* 27, no. 1 (2018): 63-100; Rainer Herrn with Michael Thomas Taylor and Annette F. Timm, "Magnus Hirschfeld's Institute for Sexual Science: A Visual Sourcebook," in *Not Straight from Germany: Sexual Publics and Sexual Citizenship since Magnus Hirschfeld*, ed. Michael Thomas Taylor, Annette F. Timm, and Rainer Herrn (Ann Arbor: University of Michigan Press, 2017), 37-79.

¹² H. W. Armit, *Catalogue of the Museum* (London: Imperial College of Science and Technology, 1913), 19-20.

¹³ "Vom Londoner Aerzte-Kongreß," *Berliner Börsen-Courier*, August 17, 1913, 7.

¹⁴ Wolff, *Magnus Hirschfeld*, 136-38.

¹⁵ *Ibid.*, 136.

could enjoy the recognition and interest of a fairly wide circle at the Imperial College of Science and Technology).¹⁶

There is no question that Hirschfeld—and Wolff also, as his disciple—were being upbeat about his endeavours at the Congress. No such exhibit had ever previously been presented in Britain. However, his efforts generated little by way of obvious enthusiasm from the other delegates. No matter how polite they were to him in person, his contributions to the Congress received very little public comment in Britain. Aside from the Congress's *Catalogue*, no mention of Hirschfeld is made in the various publications related to the event (such as the *Abstracts of Reports*, *Daily Journal*, and multi-volume proceedings). This is astonishing, given the extent of his endeavours. Likewise, his involvement at the conference received no report whatsoever in the British medical press, nor the country's newspapers. A telling behind-the-scenes insight into this palpable silence is provided by the homophile playwright and poet Laurence Housman, who accompanied Edward Carpenter to hear Hirschfeld speak at the Congress and view the "Sexual Transitions" exhibit. Writing for a collection of reminiscences about Carpenter following his death in 1929 (published in 1931), Housman made a clear statement about the reception that Hirschfeld received from other physicians at the Congress, stating that "English doctors who attended those lectures declared that they were "an eye-opener", but naïvely added that here there was no possible public to encourage such investigation."¹⁷

The only commentary relating to Hirschfeld's activities at the Congress that appeared in a British periodical was published by another homophile writer in the

¹⁶ Hirschfeld, *Homosexualität*, 550; Hirschfeld, trans. Lombardi-Nash, *Homosexuality*, 623.

¹⁷ Laurence Housman, "A Peaceful Penetrator," in *Edward Carpenter: In Appreciation*, ed. Gilbert Beith (London: George Allen & Unwin, 1931), 107-11, 110.

New Freewoman—a freethinking feminist journal edited by the prominent English suffragette Dora Marsden. As Florence Binard and Deborah Cohler have discussed, both the *New Freewoman* and its precursor, the *Freewoman*, carried various articles and correspondences on the subject of homosexuality, most of which were prompted by the works of Edward Carpenter.¹⁸ Interestingly, it was a naturalist, the ornithologist, suffragist, and animal rights campaigner E. Bertram Lloyd, who responded to Hirschfeld’s contributions to the Congress. His article, entitled “Intermediate Sexual Types,” appeared in the edition of the *New Freewoman* dated October 1, 1913. In it Lloyd applauded Hirschfeld’s “Sexual Transitions” exhibit as “one of the most striking and important sections” at the Congress, although he admitted that attendance, at both the exhibit and at Hirschfeld’s public lectures, “was much smaller than lovers of justice and truth could have desired, in view of the prevalent ignorance and the consequent backward state of our laws in England on the question.”¹⁹ He continued:

Dr. Hirschfeld, the tireless opponent of cant and ignorance in this department of science, who has done so much to increase our still extremely inadequate understanding of this most intricate and important subject, besides a long series of photographs, also had on view a number of wax models of human hermaphroditic and intermediary sex-types. It may be hoped that, to some at least of the visitors, the exhibit came as an eye-opener. For though we are permitted in this country—in the name of Science—to write and talk freely on such matters in connection with insects, fishes, or even the higher mammals, the heavy veil of Decency (so often the bitterest enemy of truth) enshrouds practically all open discussion of the question the moment the human race (and more especially it may be added our own nation) is involved.²⁰

¹⁸ See Florence Binard, “The Debate on Homosexuality in *The Freewoman* Journal (1911-12),” *Cahiers victoriens et édouardiens* 79 (2014): <http://journals.openedition.org/cve/1072> (accessed May 2, 2020); Deborah Cohler, *Citizen, Invert, Queer: Lesbianism and War in Early Twentieth-Century Britain* (Minneapolis: University of Minnesota Press, 2010), ch. 3.

¹⁹ E. B. Lloyd, “Intermediate Sexual Types,” *New Freewoman*, October 1, 1913, 155-56, 155.

²⁰ *Ibid.*

Lloyd proceeded to lament the prevailing social and legal persecution of sexual intermediaries, including the situation whereby the catalogue of the British Museum omitted entries for Ellis's *Studies in the Psychology of Sex* while assiduously listing all his other books. The appeal of Hirschfeld's biological sexology to Lloyd, a passionate naturalist as well as humanitarian, is palpable. "Generally speaking", he wrote, "Nature abhors a hard and fast line just as it does a vacuum; and as we are now aware the chain of sexual continuity shows no break of any note, either on the physical or on the mental side, in its subtle gradations from the most womanly woman to the most manly man."²¹ He continued: "Indeed we have learned that, for thoughtful people at any rate, such antiquated abstractions as 'Man' and 'Woman' *per se*, will at no very distant date have to be relegated to realms of the philosopher's Absolute."²²

Most interestingly, Lloyd associated Hirschfeld's exhibit with criticism of the law relating to sex acts between males, and the call for its reform. Such a call had been made by Ellis and Symonds in *Sexual Inversion*, but with little discernible effect. Lloyd wrote:

The question is whether society should continue to brand-mark and persecute people of the so-called Uranian temperament (by implication, as well as by absurd though cruel laws), or whether the time has not now arrived when some reasonable tolerance should be extended to them. It is possible that if all our Members of Parliament, lawyers, theologians, doctors, and so on, had been forced to see the exhibition of intermediate sexual types at the Medical Congress, some alteration for the better in our national treatment of this matter would have resulted.²³

It was highly unusual for scientific arguments like this to appear in a British periodical in 1913. The *New Freewoman* had only a limited circulation (around four

²¹ Ibid., 156.

²² Ibid. Lloyd's italics.

²³ Ibid.

hundred), and Lloyd's advocacy—in common with Hirschfeld's exhibit—remained an oddity of Edwardian sexology. Nonetheless, Lloyd's commentary is a useful indication of how developing sexological discourses began to generate new calls for law reform in late-Edwardian Britain, a trend that gained pace through the interwar era.

While the immediate impact of his exhibition among professional physicians and biologists was tangibly muted, Hirschfeld's presence in London in 1913 enthused a group of around twenty sex reformers (virtually all of them homosexual men) to form a new society based in London with the aim of nurturing public support for sex reform. As discussed in the introduction to this thesis, Lesley Hall, and other historians, has described how the group met with Hirschfeld at the Hotel Cecil on August 12, 1913.²⁴ Among them were Carpenter, Housman, Anglican theologian Kenneth Ingram, writer and reformer George Cecil Ives, Uranian poet Charles Kains-Jackson, and E. Bertram Lloyd. Initially styled the British Society of Psychiatry, the group became the British Society for the Study of Sex Psychology (BSSSP) in 1914, changing to the British Sexological Society in 1930. Although the BSSSP was dominated by gay men, the organisation sought to attract female members and encompass a range of topical sex-related issues including prostitution, sex education, and venereal disease. Its inaugural publication stated that the new society had been established “for the consideration of problems and questions connected with sexual psychology from their medical, juridicial, and sociological aspects.”²⁵ Among its female members were the socialist feminist Stella Browne, the Jungian psychologist Constance Long, psychoanalyst Barabara Low, and the first British female

²⁴ Hall, “British Society of the Study of Sex Psychology”; Hall, “Disinterested Enthusiasm.” See also Weigle, “Psychology and Homosexuality.”

²⁵ The British Society for the Study of Sex Psychology, *Policy & Principles. General Aims*. (London: C. W. Beaumont for the Society, 1914).

psychiatrist Jessie Murray. The membership of the organisation was always modest (“a few hundred at its largest” according to Hall) but its dedicated committee maintained momentum through the 1920s and 30s, staging lectures and producing publications on sex-related subjects by leading authorities (not least biologists F. A. E. Crew and Julian Huxley, discussed in the next chapter of this thesis).²⁶ The Society ceased existence at some point during the depravations of the Second World War.

It is conceivable that Hirschfeld’s presence in London in August 1913 had a subtler impact on British scientists and physicians, but evidence to this effect is wanting. In its edition dated April 25, 1914, the *Lancet* afforded Hirschfeld’s *Die Homosexualität des Mannes und des Weibes* a rare mention in a British periodical, conferring the German sexologist some respect for his efforts but cautioning against hasty generalisation based on cases brought before the specialist. The brief notice, in a lengthy piece titled “Society and Sex Problems,” might itself be taken as a sign of progress, but the anonymous reviewer mainly used the opportunity to assert that “this particular sort of crime among men” was rare in Britain.²⁷ Sexual relations between women were said “to be somewhat common among the luxurious and idle classes”.²⁸ The abiding impression of the notice is that the *Lancet* reporter had simply not read Hirschfeld’s lengthy German text.

Much more remarkably, in the weeks and months following the Congress, a series of new initiatives underscored British contributions to the new biology of sex, especially those relating to avian sex transformations, not just within the medico-scientific professions but in Britain’s newspapers. A sign of change, probably

²⁶ Hall, “Disinterested Enthusiasm,” 665.

²⁷ “Society and Sex Problems,” *Lancet*, April 25, 1914, 1200-3, 1203.

²⁸ Ibid.

unconnected to the Congress but still nonetheless indicative of British scientists' growing interest in sex variations, is the annual (eighty-third) meeting of the British Association that took place in Birmingham between September 10-17, 1913, one month after the Congress, and which included several papers pertaining to intersexualities and transformations of sex.

Most striking is the interest that the *Daily Mail* showed in some of these. On September 16, 1913, under the headline "Science and Sex: Tales of Remarkable Discoveries: Radium Brood of Monster Frogs," the paper referred to an early study by the English psychologist Cyril Burt on "the human male and female", in which he argued that there were no differences in intellect, character, or instinct between women and men.²⁹ More notably, Geoffrey Smith had discussed his research on parasitic castration (explored below), with the *Daily Mail* reporting that this "young and brilliant Oxonian" had travelled to a Tasmanian lake for his study and that he had informed the British Association "that he discovered a crab of which the gender was changed during life by the action of a parasite." Following this, and under the by-line "Double-Sexed Pheasant," the piece further reported that "[a] pheasant was described which was all male on one side both in plumage and in anatomy and all female on the other" (he is not named in the report but the bird was shown at the meeting by C. J. Bond). The piece continues: "In some moths sex is entirely determined and passed on by one of the parents" (again unnamed in the report, but this is a reference to a paper on the physiology of sex determination presented at the meeting by Leonard Doncaster). Ostensibly, the *Daily Mail* article resonates with previous reports on theories of sex determination that the paper had periodically

²⁹ "Science and Sex: Tales of Remarkable Discoveries: Radium Brood of Monster Frogs," *Daily Mail*, September 16, 1913, 7. See also *Report of the Eighty-Third Meeting of the British Association for the Advancement of Science. Birmingham: 1913. September 10-17*. (London: John Murray, 1914), esp. 521 (Bond), 670-1 (Smith), 671-72 (Doncaster), 750-1 (Burt).

published since the sensational coverage of Leopold Schenk's theory in 1898. The foregrounding of sex-variant animals, however, both at the meeting of the British Association and in the *Daily Mail*, was something new in British newspaper reporting and is indicative of changing sexual mores wrought by the rapid development and dissemination of the new biology of sex, which necessarily focussed intensely on anomalies and variations.

Even more strikingly, in the spring of 1914, Arthur Keith, who had presided over Hirschfeld's "Sexual Transitions" exhibit at the 1913 Congress, initiated a series of high-profile enterprises at the Royal College of Surgeons that showcased Britain's contributions to the new "reproductive" biology, especially research on sex reversal in fowl that Samuel George Shattock had pursued in his capacity as pathological curator of the College's Museum. Keith presented a series of lectures on "Imperfect Differentiation of Sex." A notice in the *British Medical Journal* (April 11, 1914) states that the lectures were "open to all medical men and students of medicine" and would demonstrate how recent additions to the Museum's collections exemplified "those difficult cases in which medical men are called on to settle the question of sex when the external manifestations are ambiguous."³⁰ The additions referred to were laid out by Keith in his own temporary display on abnormal development of the sexual system at the Hunterian in July 1914. It formed part of a larger exhibition of specimens added to the Museum's collections throughout the previous year that accompanied Keith's annual report as the Museum's conservator and the annual elections to the council of the Royal College of Surgeons.

³⁰ "Imperfect Differentiation of Sex," *Lancet*, April 11, 1914, 834.

Somewhat sensationally, Keith's *Report* for the year (dated June 17, 1914) revealed that the new acquisitions relating to sex variations had prestigious, indeed regal, provenance. He wrote:

Mr. Shattock and the Conservator have made further enquiries into the condition of the genital glands in cases where a change has taken place in external sexual characters. In this connexion a "mule" pheasant, graciously presented to the Museum by His Majesty the King, is of interest. In most cases a "mule" pheasant is a hen bird which has assumed, to a greater or less degree, the plumage and characters of a cock bird. A change can usually be detected in the ovaries of such birds, part of the ovary being replaced by tissue of a testicular nature. In the case just mentioned the partial assumption of the male plumage was evidently due to another cause. Vestiges of the two glands, probably representing ovaries, were present, but as there were neither oviducts nor testicular ducts developed, the present instance must be regarded as an asexual or neuter bird.³¹

The details of the dissection were scientifically unremarkable (suchlike had been described in science journals for over a century), and do not appear to have been recounted to any great extent elsewhere. Notwithstanding this, the occasion of the Royal College of Surgeons' annual rituals was an important one in the calendar of British biologists and medical professionals and the involvement of the king (George V) made Keith's exhibit on the imperfect differentiation of sex a major talking point.

Unlike Hirschfeld's earlier (and larger) exhibit, which had only captured the attention of a German newspaper and the *New Freewoman*, Keith's display was widely reported, not just in the medical but the mainstream press—in Britain, nationally and regionally, but also across the world.³² It was, in this important sense,

³¹ [Arthur Keith], *Royal College of Surgeons of England. Annual Report on the Museum by the Conservator (June 17th, 1914)*, 6. A list of specimens towards the end of the *Report* (27) catalogues three birds donated by the king, along with a specimen of a hen pheasant (donated by Sir Thomas Wrightson) which did not exhibit secondary sexual characteristics of a cock and which had been prepared for exhibition alongside the king's birds by way of comparison.

³² For the medical press, see "The Museum of the Royal College of Surgeons of England," *Lancet*, July 4, 1914, 41-42.

momentous—fully escalating media interest in the new biology of sex from a basic concern with sex determination to a primary focus on variations of sex, with a royal seal of approval to boot. *The Times* (July 2, 1914) began the trend with an article entitled “Transformation of Sex: Hen Pheasants in the Plumage of Cocks: Specimens from Sandringham.” The piece is a prime example—one which sets the pace for later reporting of sexological stories in Britain’s newspapers—of how popular narratives of the emerging biology of sex were adapted to achieve ideological ends that could not be achieved in specialist scientific texts, a key argument of this thesis. Specifically, the report in *The Times* works to render studies of avian sex transformation, and the study of sex variations more generally, socially acceptable by emphasising its precedence in British science and the elite credentials of biologists now engaged in such research. It leads with a palpable nod to the paper’s mainly middle-class readers that sex variations, at least in avian subjects, were now a legitimate and respectable object of scientific and otherwise elite study:

One part of the exhibition which opens today at the Royal College of Surgeons, Lincoln’s Inn Fields, when the annual election to the council takes place, is designed to illustrate a problem in which sportsmen are interested as well as medical men. If we may judge from the fact that some of the most instructive specimens were obtained at Sandringham and were presented to the Royal College by command of the King, the problem is one in which his Majesty takes a personal interest.³³

Buoyed by the king’s unassailable public gender credentials, and the assurance that avian sex transformation was a concern of sportsmen (i.e., hunters), *The Times* rendered the new biology of sex variations palatable to the British middle class. The article was echoed in Britain’s local newspapers and internationally and, notwithstanding the intercession of war, set the pace for reporting sexological stories

³³ “Transformation of Sex: Hen Pheasants in the Plumage of Cocks: Specimens from Sandringham,” *The Times*, July 2, 1914, 5.

relating to sex variations in Britain, an endeavour that was pursued with gusto through the interwar era (discussed further in the following chapter of this thesis).³⁴

The deliberateness of this move towards popularisation on behalf of British biologists, appearing as it did precisely at the time when, as Adele E. Clarke has described, the central focus of the new sexological or “reproductive” biology was shifting from Britain to the United States, is underscored by another aspect of Keith’s display at the Hunterian.³⁵ Despite the prestigious credentials of the royal pheasants, they were not in fact his star exhibit. That honour went to none other than Lady Tynte’s eye-feathered peahen, referred to in the previous chapter of this thesis, which had been described by John Hunter in 1780 but which was apparently still going strong as an exemplar of avian sex transformation.

Originally presented to the Leverian Museum, the mounted bird was acquired by the Museum of the Royal College of Surgeons when the Leverian closed in 1806 and its many exhibits sold in individual lots at auction.³⁶ Over the course of a century, Lady Tynte’s peahen was occasionally mentioned in recollections of Hunter’s classic paper on avian sex transformation, indicating that it was on display for much of that time. Most of the stuffed specimens in the Hunterian collection were presented to the British Museum in 1835 having been deemed unsuitable for the Royal College of Surgeons’ Museum (which prefers its specimens pickled in parts rather than stuffed whole). According to the *Calendar of the Royal College of*

³⁴ See, for example, “Hen Birds in Male Plumage,” *Hull Daily Mail*, July 2, 1914, 3; “The Changing of Sex: Hen Pheasants in the Plumage of Cocks,” *Liverpool Echo*, July 2, 1914, 3. See also “Scientists Study the Phenomena of Birds That Apparently Change Sex,” *Washington Post*, July 19, 1914, 15; “Hen Pheasants Are Masculine in Time: Tendency Among Females of Tribe to Assume Male Plumage Amazes Science: Notable Case of ’76 Cited: Investigations of Shifting Sex of Lower Animals is Being Studied by British,” *Greencastle Daily Herald*, December 5, 1914, 3.

³⁵ See especially Clarke, *Disciplining Reproduction*, ch. 3.

³⁶ The auction catalogue, which includes the twentieth day, 27 May, describes Lot 2310 as “A fine and curious specimen of the pea-hen, which in its eleventh year put forth the plumage of the male bird”. *Catalogue of the Leverian Museum, Part III. Including the third Eight Days’ Sale* (Hayden [printer]), 99.

Surgeons of England for 1909, however, a small collection of about forty stuffed animals, including Lady Tynte's sex-transformative peahen and other specimens acquired at the Leverian auction, remained in the basement of the Hunterian. The report in the *Calendar* reads: "These specimens, merely of historical interest, were offered to, and finally accepted by, the authorities of the British Museum with the exception of a pea-hen, showing the male plumage, which is described by Hunter in his paper "On an extraordinary pheasant." This specimen has been placed in the College Museum."³⁷ Nothing is said about why Lady Tynte's peahen, clearly still fit for exhibition, was the sole specimen retained by the Hunterian; possibly its personal connection to Hunter accounts for it.

Whatever the reason, the bird was re-established as a unique exhibit in the Museum, albeit as a historical curiosity but brought into the service of patriotic British biologists whose interest in avian sex transformation and the insights it afforded into questions of sex development was resolutely rehabilitated as new discoveries in genetics and endocrinology once again situated avian sex transformation at the cutting edge of modern biology.³⁸ Such practical and rhetorical manoeuvring suggested, somewhat whiggishly, a continuous line of scientific endeavour stretching from Hunter to 1914; as the *Times* article on Keith's exhibition put it: "The exhibition now open shows that the investigations begun by John Hunter a century and a half ago are being continued by the officers of the museum, and that

³⁷ *Calendar of the Royal College of Surgeons of England* (London: Taylor and Francis, 1909), 357.

³⁸ Other sex transformative birds are listed in the various catalogues of the Museum of the Royal College of Surgeons, which span the nineteenth- and early-twentieth centuries. Sadly though, there are no surviving specimens in the Hunterian today. All the examples, including Lady Tynte's extraordinary peahen, were most likely destroyed when the Museum was bombed by the Nazis in May 1941. I am grateful to Sam Alberti for his help establishing this.

the specimens provided from the Royal coverts have proved of great service in their researches.”³⁹

Keith’s exhibition appears to have confined itself chiefly to the particular question of avian sex transformation; he made no explicit claims that related his display to Hirschfeld’s earlier exhibition at the Congress of Medicine or that expressions of avian sex transformation were analogous to variations in sex physiology and sexuality in humans (Hirschfeld would certainly not have objected to that if he had). Nonetheless, by 1914, the observations and conceptual premises that underpinned Hirschfeld’s theory of sexual transitions, which included homosexuality as a slight transitional, intersexed state between female and male, can be increasingly found across several medico-scientific genres in Britain, without reference to the major sexologists who had long championed the study of sex variations as a serious and important scientific pursuit or the liberationist agendas of Ellis and Hirschfeld. The emergence of this, especially British, brand of non-homophile sexological biology was slow and piecemeal, but nonetheless did much to break some significant cultural ice, both within medico-scientific circles and more popularly.

Sexual Inversion Bows Out

For his part, Havelock Ellis extensively revised and updated *Sexual Inversion*. This third and final edition—published in 1915—was still only produced in the United States by F. A. Davis Company. The work remained the most extensive English-language overview of the subject through the first half of the twentieth century, but

³⁹ “Transformation of Sex.”

received barely any attention.⁴⁰ Ellis incorporated the latest ideas and writings of continental sexologists such as Magnus Hirschfeld, Albert Moll, and Paul Nöcke as well as Sigmund Freud and other psychoanalysts. As Ivan Crozier has discussed, though, he largely rejected psychoanalytic notions of homosexuality.⁴¹ Curiously, Crozier does not discuss the sexological innovations that Ellis did embrace in the new edition of *Sexual Inversion*. Most significantly, Ellis incorporated studies by biologists—a substantial adaptation on earlier editions—whose studies he believed affirmed his long-standing view of sexual inversion as innate. For example, contemplating the degree to which the sexual instinct was undifferentiated during the first years of puberty, Ellis wrote:

We have to admit, however, that, in the opinion of the latest physiologists of sex, such as Castle, Heape, and Marshall, each sex contains the latent characters of the other or recessive sex. Each sex is latent in the other, and each, as it contains the characters of both sexes (and can transmit those of the recessive sex) is latently hermaphrodite. A homosexual tendency may thus be regarded as simply the psychical manifestation of special characters of the recessive sex, susceptible of being evolved under changed circumstances, such as may occur near puberty, and associated with changed metabolism.⁴²

Elsewhere in the new edition of *Sexual Inversion* (and echoing Hirschfeld's remarks cited at the top of this chapter), Ellis explicitly situated Darwin, as well as the prominent German biologists August Weismann and Ernst Haeckel, in the intellectual genealogy of the concept of the latent bisexuality of all males and females, a concept Ellis traced back to Plato's famous origin myth in the

⁴⁰ The only review of the work by a British author that I have been able to find is F. W. Stella Browne, review of *Studies in the Psychology of Sex. Vol. 2: Sexual Inversion*, 3rd edition, by Havelock Ellis, *International Journal of Ethics* 27, no. 1 (1916): 114-15.

⁴¹ Crozier, "Taking Prisoners."

⁴² Havelock Ellis, *Studies in the Psychology of Sex. Vol 2: Sexual Inversion*, 3rd ed. (Philadelphia: F. A. Davis Company, 1915), 79-80.

Symposium.⁴³ By way of further support Ellis cited Shattock and Seligmann's study of "allopterotism" in fowl, as well as studies by C. J. Bond, David Berry Hart, and John Bland-Sutton. This cohort of (mainly British) biologists and gynaecologists represents a significant change in tone from earlier editions of *Sexual Inversion*; indeed, Ellis's genealogy of the principle of primordial intersexuality reflected upon the shifting disciplinary boundaries that had maintained innate bisexuality at the heart of modernist sexology:

We thus see that the ancient medicophilosophic conception of organic bisexuality put forth by the Greeks as the key to the explanation of sexual inversion, after sinking out of sight for two thousand years, was revived early in the nineteenth century by two amateur philosophers who were themselves inverted (Hössli, Ulrichs), as well as by a genuine philosopher who was not inverted (Schopenhauer). Then the conception of latent bisexuality, independently of homosexuality, was developed from the purely scientific side (by Darwin and evolutionists generally). In the next stage this conception was adopted by the psychiatric and other scientific authorities on homosexuality (Krafft-Ebing and the majority of other students). Finally, embryologists, physiologists of sex and biologists generally, not only accept the conception of bisexuality, but admit that it probably helps to account for homosexuality. In this way the idea may be said to have passed into current thought.⁴⁴

Various issues could be taken with the details of Ellis's account here, even his tidy genealogical narrative per se, but his recognition of a disciplinary convergence on sexological terrain is nonetheless pertinent.

Ellis further incorporated additional material relating to "internal secretions" into the new edition of *Sexual Inversion*, accepting—as Hirschfeld had—that sex endocrinology provided the most promising means of understanding sexualities scientifically. At one point he referred to an acquaintance, a female physician in the United States, who had told Ellis that she had noticed "the tendency to growth of hair

⁴³ Ibid., 311.

⁴⁴ Ibid., 314.

on the legs” in female inverts.⁴⁵ Ellis wrote that such “piliferous anomalies” were readily understandable if, “as is not improbable”, sexual inversion was “associated with some abnormal balance in the internal secretions”.⁴⁶ Elsewhere in the text, Ellis wrote:

It is probable that we may ultimately find a more fundamental source of these various phenomena in the stimulating and inhibiting play of the internal secretions. Our knowledge of the intimate association between the hormones and sexual phenomena is already sufficient to make such an explanation intelligible; the complex interaction of the glandular internal secretions and their liability to varying disturbance in balance may well suffice to account for the complexity of the phenomena. It would harmonize with what we know of the occasional delayed manifestations of homosexuality, and would not clash with their congenital nature, for we know that a disordered state of the thymus, for instance, may be hereditary, and it is held that status lymphaticus may be either inborn or acquired. Normal sexual characters seem to depend largely upon the due co-ordination of the internal secretions, and it is reasonable to suppose that sexual deviations depend upon their inco-ordination. If a man is a man, and a woman a woman, because (in Blair Bell’s phrase) of the totality of their internal secretions, the intermediate stages between the man and the woman must be due to redistribution of those internal secretions.⁴⁷

“Whatever its ultimate explanation,” Ellis wrote, “sexual inversion may thus fairly be considered a “sport,” or variation, one of those organic aberrations which we see throughout living nature, in plants and in animals.”⁴⁸

Ellis clearly felt vindicated that the theory of sexual inversion, founded in the principle of primordial hermaphroditism that he (and John Addington Symonds) had advanced almost two decades previously, was being echoed by modern biologists. With some minor exceptions, however, his intellectual generosity was not reciprocated. For the most part, the new generation of mainly Oxbridge educated

⁴⁵ Ibid., 254.

⁴⁶ Ibid.

⁴⁷ Ibid., 316.

⁴⁸ Ibid., 317.

British biologists who were now, somewhat belatedly, pursuing essentialist models of sex development and sexualities, became reticent to explicitly ally themselves with the liberationist sexology of Ellis, Hirschfeld, and other socialist-inclined freethinking sex campaigners.

Notwithstanding the sidelining of Ellis and his *Studies*, as the emerging biology of sex took a firm hold in Britain, a new popular work was published that attempted to bridge the territory between his sexological studies and “reproductive” physiology. Titled *An Introduction to the Physiology and Psychology of Sex* (1917, 3rd ed. 1934), it was written by Solomon Herbert, a physician and popular science writer whose other books offered accessible accounts of evolution and heredity. *Introduction* is a notable work. Despite its broad-sounding scope, however, in practice Herbert’s book is structured tightly around human reproduction, with chapters swiftly traversing modes of reproduction in the natural world, through the basics of human reproduction and pregnancy, and highly simplistic descriptions of sex differences between men and women.

Drawing heavily on Ellis’s *Studies*, a chapter titled “Aberrations of Sex” includes brief discussions of masturbation, erotic symbolism, and sexual inversion. “Love,” Herbert wrote, “as a sex phenomenon, may be defined as a feeling of physical and spiritual unity between two persons of opposite sexes. To the physical desire in man there are linked emotional and æsthetic impulses which transmute the gross animal nature into an experience which forms the choicest flower of humanity.”⁴⁹ It was, he argued, the separation of these factors that led to the aberrations of sex. Herbert therefore worked to disassociate the so-called aberrations from notions of normality while simultaneously arguing that they were not unnatural.

⁴⁹ Solomon Herbert, *An Introduction to the Physiology and Psychology of Sex* (London: A. & C. Black, 1917).

Herbert's theory of sexual inversion largely echoed Ellis's formulation in the third edition of *Sexual Inversion*, but Herbert's expression of it was, again, highly simplistic. "We can view the sexual inversion," he wrote, "in agreement with the general theory of sex, as a sort of psychic hermaphroditism, an innate disturbance of the normal sex-complex, due to a redistribution of the normal male or female harmonic balance."⁵⁰ Contra Ellis, who had largely rejected psychoanalysis, Herbert did give credence to "the Freudian school", accepting that certain expressions of homosexuality could be explained psychologically rather than biologically.⁵¹ His narrative therefore reflected key developments that had reshaped the pursuit of sexology in Edwardian Britain. Most notably, his analysis broached what he called "the social problem of the invert", proffering a further call for reform of the law relating to sex acts between men.⁵² As already indicated by Ernest Bertram Lloyd's remarks in the *New Freewoman*, discussed above, such calls emanating from medico-scientific contexts become more common from around 1913/14, reflecting the growing hegemony of sexology in late-Edwardian Britain, although they remained rare. Herbert wrote:

At present the law punishes all homosexual practice severely. This is, in view of the inborn nature of inversion, which may take on the sublimest form of worship, as cruel as it is futile. It is estimated that about one or two per cent. of the population is actually born with this anomaly. We ought to treat the inverts, so long as they avoid public scandal and do not corrupt healthy people, in the same way as we treat other abnormal persons, say those suffering from colour-blindness or deaf-mutism.⁵³

Herbert's plea for legal emancipation was thus heavily loaded. While he was keen to urge the end of social opprobrium against homosexuals, "a relic of medieval

⁵⁰ Ibid., 113-14.

⁵¹ Ibid., 123.

⁵² Ibid.

⁵³ Herbert, *Introduction*, 123.

ignorance and prejudice”, his was not a plea for equality.⁵⁴ Homosexual love, he wrote, could not be viewed as equivalent to heterosexual love: “The former is and must remain barren; but love from a biological and social point of view, however justified and beautiful in itself, has after all another, not less important, function in life—namely, procreation. It is this which gives wedded love a zest and aim which homosexual love can never attain.”⁵⁵ Herbert therefore succeeded where Ellis had failed in publishing a popular sexological text, written by a British physician, in Edwardian Britain, but his authorial voice was decidedly different to Ellis—more simplistic in its rhetoric, and less radical in his advocacy.

Hybrids, Mosaics, and Ensembles: Changing Concepts of Hermaphroditism

The continued development of ideas and practices relating to the question of how Mendelian heredity and chromosomes might act to determine sex characteristics was rapid and complex through the late-Edwardian era. A protracted and sprawling scientific discourse on the subject filled scholarly and popular works of medical science as biologists in America, Britain, and on the Continent tried to work it out in a fiercely competitive scientific arena. As debates proliferated, and competing models rose and fell in rapid succession, the exceptions of sex took on increasingly prominent positions.

Some reference was made in the introduction to this thesis to the German émigré geneticist Richard Goldschmidt, who developed a hugely influential genetic

⁵⁴ Ibid., 124.

⁵⁵ Ibid. Among other works, Herbert subsequently published other sex-related books including *Fundamentals in Sexual Ethics: An Enquiry Into Modern Tendencies* (1920) and a couple of books on psychoanalysis.

theory of sex determination based on experiments on *Lymantria* (gypsy moths) and—especially—the purposeful breeding of gynandromorphs. Goldschmidt put forward his controversial theory of sex, originally described (in German), in 1911.⁵⁶ He produced mixed-sex moths by crossing European (*Lymantria dispar*) and Japanese (*Lymantria japonica*) varieties. When he crossed Japanese females with European males, the offspring were all typically female and male. When, however, he crossed Japanese males with European females, all the male offspring were typically male but the female offspring exhibited male characteristics. In other experiments, he produced typical female offspring and mixed-sex males. Goldschmidt initially termed the mixed-sexed moths gynandromorphs, but subsequently coined the term “intersexuality” believing his intersexed gypsy moths to be an intermediary stage between male and female (different from the sex mosaicism of gynandromorphs). He claimed to have bred every stage of female intersexuality—from a typical female through different intersex gradations (“female-males”) to that of typical male (which was still genetically female, but not visibly so). And he claimed also that he could continue to do so at will.

Going in the other direction, Goldschmidt bred male intersex gradations from a typical male towards a typical female, but only as far as three quarters of the way. He argued that his experiments conclusively demonstrated sex determination to be a quantitative rather than a qualitative process. All individuals, he argued, contain the anlagen for both sexes, the relative development of female and male structures, depending upon the relative doses or potency of sex-determining biochemicals produced by the sex chromosomes. In contrast to the mechanical actions posited by some Mendelians (such as Morgan), Goldschmidt’s “balance theory” therefore held

⁵⁶ See, for example, Linge, “The Potency of the Butterfly”; Dietrich, “Experimenting with Sex”; Dietrich, “Of Moths and Men”; Richmond, “The Cell as the Basis for Heredity.”

sex to be a matter of degree rather than kind, facilitating a new approach towards occurrences of sex variations in nature and in the laboratories of experimental biologists.

In his early papers on sex determination, Goldschmidt did not extend his theory to (human) homosexuality although this would subsequently become an important aspect of his work on sex determination, the troubled influence of which would stretch well into the post-1945 era (the central importance of Goldschmidt's theory on British biologists during the interwar period, especially F. A. E. Crew and Julian Huxley, is discussed in chapter three of this thesis). Goldschmidt's early experiments on *Lymantria*, however, were outlined for English-language readers in *The Determination of Sex* (1914) by Leonard Doncaster.⁵⁷

Homosexuality became embroiled with genetics in disparate ways before Goldschmidt extended his theory to sexual orientation. A minor, but nonetheless indicative, example can be found in the studies of “sex hybrid” pheasants by the amateur English naturalist and writer Rose Haig Thomas, a passionate and influential advocate of the new genetics from the outset, who made a number of studies of Mendelian inheritance of sex characteristics and sex variations in pheasants, including collaborations with William Bateson, Julian Huxley, and Geoffrey Smith. Among her numerous contributions, Haig Thomas recognised that mixed-sex birds occurred more frequently as a result of crossing different pheasant varieties. Addressing the Zoological Society of London in 1912, she remarked that first generation hybrid crossing “occasionally produces remarkable mosaics of sex—a

⁵⁷ Doncaster, *Determination of Sex*, 115.

sort of sex-hybridism accompanied by sterility and extraordinary developments of plumage in the female”.⁵⁸

In collaboration with Geoffrey Smith, Haig Thomas’s breeding experiments prompted an innovative and influential proposition concerning the possible sexing effects of genetic differentiation on the tissues of the body. Their joint study, published in the *Journal of Genetics* in June 1913, concerns four common pheasants that Haig Thomas and Smith described as “abnormal or “mule” which, when dissected, proved to be females with atrophy of the ovaries.⁵⁹ All four exhibited male-typical characteristics in their plumage (“to slightly varying extents”).⁶⁰ In addition to these birds, Smith and Haig Thomas considered four other birds. Three of these were hybrid females and only short anatomical descriptions were provided. The lengthier description of the fourth female bird, a sterile pure-bred Formosan variety of the Chinese pheasant (*P. torquatus*), is more interesting, documenting the bird’s (homo)sexual behaviour, a first for the *Journal of Genetics*:

This bird was hatched in May 1909, and in September of that year was observed to “feather up” like a cock, and showed rather more of the red face-skin than a normal female. During this year it also developed a few feathers of the male colour on the inner part of the thigh. In July 1910 it began to tread the hens placed with it and was heard to utter the male cry, though no male plumage appeared until October when a few dark feathers were noticed below the bill. These were lost however at the moult. In 1911 the bird again developed male behaviour and at the September moult began to assume male plumage to a marked degree. During October it acquired a brown-tinted flush over the body, wings and tail, dark feathers appeared on the breast, the white collar characteristic of the male of this species appeared, and the throat and neck feathers were of the lustrous green colour found in the male.⁶¹

⁵⁸ Rose Haig Thomas, “Experimental Pheasant-breeding,” *Proceedings of the Zoological Society of London* 82, no. 3 (1912): 539-46, 543.

⁵⁹ Geoffrey Smith and Rose Haig Thomas, “On Sterile and Hybrid Pheasants,” *Journal of Genetics* 3 (1913): 39-52, 39.

⁶⁰ *Ibid.*, 43.

⁶¹ *Ibid.*, 46.

The bird was killed in the summer of 1912 and dissected; the ovary was found to be greatly shrivelled and without oocytes while the oviduct was hypertrophied.

Among the several theoretical considerations in Haig Thomas and Smith's paper is the occurrence of male-typical characteristics in female birds (in which the ovaries were invariably atrophied) in relation to the occurrence, much rarer, of female-typical characteristics in male birds (in which the testes were unaffected), such as had been described by Hammond Smith in the *Field* (mentioned in the previous chapter of this thesis).⁶² Possibly, they suggested, the two phenomena had wholly different causes. In the case of female birds, it seemed to be clear that the change in plumage was due to the atrophied ovaries and was therefore a matter of “*correlated differentiation*” (i.e., correlated with the action of the gonads). In the case of the male birds, they suggested that expressions of female-typical characteristics were a matter of abnormal “*hereditary transference*”.⁶³ Of the latter, Haig Thomas and Smith wrote:

That such hereditary transferences of secondary sexual characters from one sex to the other often occur, without the normal reproductive capacity of the individual being affected, is well known: common instances are the hen-plumage of the Sebright Bantam cocks [i.e., henny game], and the appearance of spurs in the females of many breeds of fowls. In both these cases the males and females are perfectly normal reproductive individuals; all that has happened to them is the transference in heredity of a particular group of secondary sexual characters which properly belong to the opposite sex.⁶⁴

It would, they went on to say, be “rash” to press their argument beyond its relevance to the individual avian specimens that were their primary focus. But they nonetheless believed that “a logical classification of secondary sexual characters, both normal

⁶² Smith and Haig Thomas's paper contains a further communication from Hammond Smith on the matter.

⁶³ Ibid., 45. Italics in original text.

⁶⁴ Ibid.

and abnormal” could be more generally established on the basis of their two main subdivisions—of correlated differentiation and hereditary transference.

Homosexuality was further embroiled with Mendelian genetics in a highly idiosyncratic model of sex development forwarded by the Scottish gynaecologist David Berry Hart, a lecturer on midwifery and diseases of women in Edinburgh and advocate of “antenatal eugenics”. Alice Domurat Dreger has previously discussed Hart, identifying him as one of several physicians (also including the French surgeon and gynaecologist Samuel Jean de Pozzi) who made moves not only to dismiss the concept of true hermaphroditism in humans, but to banish the term “hermaphroditism” from the medical lexicon altogether.⁶⁵ Hart’s contributions to the genetics of sex are particularly significant in that they focus primarily on humans. Despite the ease with which biologists situated the new biology of sex in eugenic contexts, Mendelian and chromosomal considerations of mammalian, including human, sex determination were surprisingly slow to be developed. Even by 1914, the human complement of chromosomes had not been established for certain. Drawing on an article published in the *Edinburgh Medical Journal* in October 1914, Dreger outlines Hart’s plan for conceptualising the sex characteristics of individuals, for which he coined the term “sex-ensemble.” Hart was resolute in ascribing the gonad as the “only criterion of sex”.⁶⁶ “Atypical” sex-ensembles, which Hart made clear in the title of the paper was his preferred terminology for “so-called hermaphroditism and pseudohermaphroditism”, were, he argued, largely wrought by dysfunctional sex glands. The glands, however, remained the determinant of an individual’s “true” sex, no matter how dysfunctional they may be and the degree to which component parts

⁶⁵ Dreger, *Hermaphrodites and the Medical Invention of Sex*.

⁶⁶ David Berry Hart, “On the Atypical Male and Female *Sex-Ensemble* (So-Called Hermaphroditism and Pseudohermaphroditism),” *Edinburgh Medical Journal* n.s. 13, no. 4 (1914): 295-316, 295.

of their “sex-ensemble” manifested as “opposite” or “inverted” to the “true” sex of the gland. Dreger states that, by this reimagining of sex differences and the medical rhetoric which described them, Hart’s schema effectively extirpated the notion of the hermaphrodite and provided criteria for dichotomously gendering even the most “atypical” sex-ensembles as either female or male.

To Dreger’s analysis can usefully be added Hart’s opinions about sexual inversion, a term that he uses interchangeably with homosexuality and which he discusses in another paper not previously identified and discussed in historiography, published in the *Edinburgh Medical Journal* in June 1915.⁶⁷ Entitled “On Inversion of the *Sex-Ensemble*,” the piece is highly idiosyncratic.⁶⁸ Even so, it is a useful example of the rampant theorising that was prompted by atomistic Mendelian and chromosomal approaches to sex. The article is also an instructive example of how, after an initial period of prudish reticence about its open discussion, homosexuality came to be explicitly embroiled in such theorising. A heady mix of evolutionary

⁶⁷ David Berry Hart, “On Inversion of the *Sex-Ensemble*,” *Edinburgh Medical Journal* 14, no. 6 (1915): 410-28. Other notable studies on sex, hermaphroditism, and Mendelism by Hart include David Berry Hart, “On Some Points in Regard to the Conditions of the Human Male and Female Usually Termed Hermaphroditism and Pseudohermaphroditism,” *International Clinics* 4 (1915): 135-44; David Berry Hart, “A New Route of Inquiry as to the Nature and Establishment of the Typical *Sex-Ensemble* in the Mammalia,” *Transactions of the Edinburgh Obstetrical Society* 39 (1914): 263-321; David Berry Hart, “Mendelian Action on Differentiated Sex,” *Transactions of the Edinburgh Obstetrical Society* 34 (1909): 303-57. Hart also made some significant studies of the freemartin. See David Berry Hart, “Note on a Case of Hunter’s Freemartin, Where There was Reversion to the Wild Park Cattle Type,” *Edinburgh Medical Journal* 14, no. 3 (1915): 194-98; David Berry Hart, “Numan, the Veterinarian and Comparative Anatomist of Utrecht: A Forgotten Observer on the Free-Martin,” *Edinburgh Medical Journal* 8, no. 3 (1912): 197-228; David Berry Hart, “The Structure of the Reproductive Organs in the Free-Martin, with a Theory of the Significance of the Abnormality,” *Proceedings of the Royal Society of Edinburgh* 30 (1909-1910): 230-41.

⁶⁸ Some delightfully condescending remarks in Hart’s obituary in the *British Medical Journal* (June 19, 1920) succinctly capture his idiosyncratic approach to the genetics of sex. It reads: “In his later work Dr. Berry Hart roamed almost solitarily (so far as obstetricians were concerned) in the mazes of Mendelism, a subject which, especially in its mathematical aspects, had a strange fascination for him. To explain the various forms of hermaphroditism, to introduce an entirely novel nomenclature, to prove that after all the “free-martin” was not a cow; and to do all this with the help of Mendelian principles was an invigorating exercise to Hart, although to others it seemed nothing less than a *tour de force* of dubious utility. He was head and shoulders above the little thinkers on these matters, and he enjoyed these speculations with his whole soul.” “David Berry Hart,” *British Medical Journal*, June 19, 1920, 852-53. Italics in original text.

theory (Charles Darwin and August Weismann), theoretical embryology, Mendelism, molecular physics (atomic theory), gynaecology, and sexology (with references to Havelock Ellis, Sigmund Freud, Richard von Krafft-Ebing, Albert Moll, and “many others too numerous to mention”), Hart’s mindboggling model of sex development sought to account both for “typical” and “atypical” (inverted) sex-ensembles.⁶⁹

The article includes Hart’s most comprehensive account of what he considered to constitute the typical (human) male and female sex-ensembles (his earlier descriptions had not included sexuality). Of the former, he wrote:

In detail we have in *the typical male sex-ensemble*, descended and functional testes, normal prostate and Cowper’s glands; a duct system in the form of the vasa deferentia and vesiculæ seminales; the opposite sex-duct elements, hydatid testis and prostatic utricle, and the congruent secondary sexual characters comprising type of pelvis, special hair distribution on anterior abdominal wall, heterosexuality with male mentality and vigour, defective mammæ.⁷⁰

And of the female sex-ensemble:

The *typical female sex-ensemble* has ovaries in the upper part of the true pelvis; uterus, tubes, vagina, external genitals, and mammæ—the *potent portion*; the *opposite sex-duct elements*—epoöphoron, paroöphoron, and Skene’s ducts—the *non-potent portion*. The *secondary sexual characters* comprise the hair distribution on the anterior abdominal wall, the pelvis, general body contour, heterosexuality, and female mentality, with in some cases an enlargement and prominence of the two upper central incisors.⁷¹

It was Hart’s contention that any one of these component elements of an individual’s sex-ensemble could become inverted during the course of development. Sexual inversion or homosexuality was therefore just one case of a broader schema of possible biological sex inversions, physical and psychological.

⁶⁹ Hart, “On Inversion of the *Sex-Ensemble*,” 414.

⁷⁰ Ibid., 410-11. Hart’s italics.

⁷¹ Ibid., 411. Hart’s italics.

Hart's dense text makes a precis difficult and unrepresentative of his convoluted chain of thought. Simply put though, his model of sex determination and its various inversions rested on gamete differentiation. He posited that both sperms and ova had two forms. He never used Y and X to refer to the two varieties of male and female gametes, referring instead (without much by way of explanation) to "Wolffian" and "non-Wolffian" gametes. Wolffian sperms contained the determinants to make up the male sex gland and sex-ensemble contained in a male sex-ensemble molecule within the sperm. Non-Wolffian sperms contained no sex-ensemble determinants. Similarly, Wolffian ova contained determinants for the female sex-ensemble; non-Wolffian ova had no sex such determinants. For a "normal" or "typical" female sex-ensemble, a Wolffian ovum had to unite with a non-Wolffian sperm; a non-Wolffian ovum fusing with a Wolffian sperm produced a "typical" male sex-ensemble. Variations and inversions within gametes, Hart wrote, were wrought at the molecular level during the process of mitosis (here he drew heavily on atomic theory) at which time a process of "inwandering" between the two kinds of gametes, Wolffian and non-Wolffian, might occur. He gave an example:

While each variety [of ova] is probably pure in its structure, variation is present, and thus we might get a Wolffian ovum with some of the Wolffian ovum determinants of the *sex-ensemble* absent, *e.g.* those for the ilium. In this way if it met with a non-Wolffian sperm-cell in fertilisation with ilium determinants present as a variation, the *sex-ensemble* of the new female zygote would contain male *sex-ensemble* determinants for the ilium, *i.e.* they would be inverted.⁷²

Homosexuality, or inversion of the "psychosexual powers", was similarly derived from atomic variations of the sex-ensemble molecule within a gamete during the process of mitosis. Such variations were irrevocable, Hart argued, although he did

⁷² Ibid., 419. Hart's italics.

suggest—when concluding his article—that homosexuality might be amenable to treatment. “Inversion is not merely a psychosexual condition,” he wrote, “but any of the units of the *sex-ensemble* may be inverted. It is an intrinsic result, and beyond prevention. The psychosexual form may be amenable to ‘suggestion.’”⁷³

In Hart’s schema, sexuality was therefore an integral part of the sex-ensemble; homosexuality just one variation of a complex matrix of biological inversions that could be wrought at the atomic level within gametes during the process of mitosis. Such an inclusive and integrated analysis was still unusual for the period—and especially coming from a British scientist—but it is indicative of the direction in which the new biology of sex was heading.

Two further points of interest arise from Hart’s extraordinary analysis. In his article he explicitly—and astutely—drew attention to the surprising lack of attention that was elsewhere paid to the biology of human sex determination. He also underscored the primacy of sex variations to the medico-scientific study of sex more generally. Much of Hart’s analysis, he wrote, was drawn from extensive observations of intersexed subjects (always “pseudo-hermaphrodites” to Hart). “Atypical *sex-ensemble* thus throws great light on the typical”, he wrote.⁷⁴

There is no mention in any of Hart’s articles on the sex-ensemble of his construal of “antenatal eugenics”, although they were written around the same time as a piece he wrote on the subject, entitled “A Lecture On Some Applications of Antenatal Eugenics in Heredity” and published in the *Lancet* (October 18, 1913). Hart’s highly speculative eugenic and sexological ruminations did not find a broader audience, but his interventions are nonetheless indicative of a proliferation of individuals who were, by 1915, ready to utilise Mendelian and chromosomal

⁷³ Ibid., 428. Hart’s italics.

⁷⁴ Ibid., 420. Hart’s italics.

concepts and rhetoric to reimagine all manner of sex-related phenomena in biological terms on a much broader scale in Britain and elsewhere—an endeavour that was pursued with gusto quickly following the end of the First World War.

Eugenics and the “Disharmonies” of Sex

Historically, the pursuit of eugenics has had ambiguous associations with changing concepts of sexual inversion, homosexuality, bisexuality, intersexuality, trans* phenomena, and other queer bodies and sexualities. While it is incontrovertibly the case that innumerable eugenicists have treated queer people with disdain and sought atrocious interventions to eliminate us from the human population, this has not consistently been the case. Elsewhere, many queer people have embraced eugenics, while homosexuality has sometimes been considered a useful eugenic method for limiting reproduction. Exploring the complexities and ambiguities that have long characterised the relationships between eugenics and queer bodies and sexualities is a growing area within historiography and is especially useful for underscoring an important lesson from that historiography: that eugenic theories and practices are largely matters of (mainly elite) opinion, prejudice, and politics.⁷⁵

⁷⁵ Some recent assessments of the historical associations between eugenics, sexualities, and sexology, all useful for further references, include Liam Oliver Lair, “Disciplining Diagnoses: Sexology, Eugenics, and Trans* Subjectivities” (PhD diss., University of Kansas, 2016), <https://kuscholarworks.ku.edu/handle/1808/21864>; Julian Honkasalo, “When Boys Will *Not* Be Boys: American Eugenics and the Formation of Gender Nonconformity as Psychopathology,” *International Journal for Masculinity Studies* 11, no. 4 (2016): 270-86; Toni Brennan, “Eugenics and Sexology,” in *The International Encyclopedia of Human Sexuality. Vol. 1: A-G*, ed. Patricia Whelehan and Anne Bolin (Chichester: Wiley Blackwell, 2015), 356-60; Merle Wessel, “Castration of Male Sex Offenders in the Nordic Welfare State in the Context of Homosexuality and Heteronormativity, 1930-1955,” *Scandinavian Journal of History* 40, no. 5 (2015): 591-609; Theo van der Meer, “Voluntary and Therapeutic Castration of Sex Offenders in The Netherlands (1938-1968),” *International Journal of Law and Psychiatry* 37, no. 1 (2014): 50-62; Florian G. Mildemberger, “Socialist Eugenics and Homosexuality in the GDR: The Case of Günter Dörner,” in *After The History of Sexuality: German Genealogies with and Beyond Foucault*, ed. Scott Spector, Helmut Puff, and Dagmar Herzog (New

Competing interpretations of the relationships between eugenics and sexology came to the fore in Germany as Magnus Hirschfeld argued that what he called sexual transitional forms, including homosexuality, ran in families and was likely to be hereditary. The idea was by no means new. Indeed, such arguments can be traced back to antiquity. But Hirschfeld's authoritative intervention on the matter reinvented the notion for twentieth-century biologists, sex reformers, and eugenicists. Writing in the *Jahrbuch für sexuelle Zwischenstufen* in 1903, Hirschfeld argued fervently that homosexuality was hereditary, but that there was no evidence to suggest such a situation denoted degeneracy or pathology.⁷⁶

Kevin S. Amidon has discussed this in relation to the fraught context of Weimar Germany, where arguments about the possible associations between homosexuality, heredity, and eugenics were played out in the pages of the *Archiv für Rassen- und Gesellschafts-Biologie* (Journal of Racial and Social Biology)—a periodical founded and edited by the leading German physician and eugenicist (“father of racial hygiene”), Alfred Ploetz.⁷⁷ In the first issue (January 1904), the Swiss-born German psychiatrist and eugenicist Ernst Rüdin, a pioneer of psychiatric inheritance studies and an intellectual force behind Nazi racial hygiene policies, questioned Hirschfeld's analysis, arguing that he had not sufficiently demonstrated that a hereditary disposition of homosexuality was unrelated to pathology. In his article, titled “Zur Rolle der Homosexuellen im Lebensprozeß der Rasse” (The Role of Homosexuals in the Life Process of the Race) Rüdin insisted that homosexuality

York: Berghahn Books, 2012), 216-30; Alexandra Minna Stern, “Gender and Sexuality: A Global Tour and Compass,” in *The Oxford Handbook of the History of Eugenics*, ed. Alison Bashford and Philippa Levine (Oxford: Oxford University Press, 2010), 173-91.

⁷⁶ Magnus Hirschfeld, “Ursachen und Wesen des Uranismus,” *Jahrbuch für sexuelle Zwischenstufen* 5, no. 1 (1903): 1-193, especially 138-59 (“Heredität und Homosexualität”).

⁷⁷ Kevin S. Amidon, “*Per Scientiam ad Justitiam*: Magnus Hirschfeld's Episteme of Biological Publicity,” in *Not Straight from Germany: Sexual Publics and Sexual Citizenship since Magnus Hirschfeld*, ed. Michael Thomas Taylor, Annette F. Timm, and Rainer Herrn (Ann Arbor: University of Michigan Press, 2017), 191-211.

was not beneficial to racial hygiene and that homosexuals should therefore not be allowed to procreate (in common with Hirschfeld, he did, however, state that homosexual acts should be decriminalised).⁷⁸ Rüdin's article was, in turn, challenged by the German sociologist and homosexual activist Benedict Friedlaender, largely on the basis that Rüdin had failed to take bisexuals into consideration but also because Friedlaender thought that homosexuals conferred non-reproductive benefits to the race, much as worker bees do for their hives.⁷⁹ Amidon shows that this was just the first of various comparable spats which appeared periodically in the pages of Ploetz's *Archiv*, culminating in 1916 with a significant article by Richard Goldschmidt in which he associated his studies on intersexes in *Lymantria* with human intersexualities and homosexuality for the first time.

Scholarship on eugenics and sex variations in Britain has largely focussed on leading sex reformers. Ivan Crozier, for example, has examined the eugenic writings of Havelock Ellis.⁸⁰ Deborah Cohler has discussed the queer eugenics of Edith Ellis which, even more than with Havelock, highlights the complexity of associations that were drawn between homosexuality and eugenics.⁸¹ Edith Ellis broached the subject of "abnormal relationships" in a paper presented to the Eugenics Education Society in November 1911 titled "Eugenics in Relation to Spiritual Parenthood."⁸² It was subsequently split into two, "Eugenics and the Mystical Outlook" and "Eugenics and

⁷⁸ Ernst Rüdin, "Zur Rolle der Homosexuellen im Lebensprozeß der Rasse," *Archiv für Rassen- und Gesellschafts-Biologie* 1 (1904): 99-109.

⁷⁹ Benedict Friedlaender, "Bemerkungen zu dem Artikel des Herrn Dr. Rüdin über die Rolle der Homosexuellen im Lebensprozeß der Rasse," *Archiv für Rassen- und Gesellschafts-Biologie* 1 (1904): 219-25, 221. See also Ernst Rüdin, "Erwiderung auf vorstehenden Artikel Benedict Friedlaenders," *Archiv für Rassen- und Gesellschafts-Biologie* 1 (1904): 226-28.

⁸⁰ Crozier, "Havelock Ellis, Eugenicist."

⁸¹ Cohler, *Citizen, Invert, Queer*, chapter 3; Deborah Cohler, "Queer Kinship, Queer Eugenics: Edith Lees Ellis, Reproductive Futurity, and Sexual Citizenship," *Feminist Formations* 26, no. 3 (2014): 122-46.

⁸² Mrs. Havelock Ellis [Edith Ellis], *The New Horizon in Love and Life* (London: A. & C. Black, 1921), 38.

Spiritual Parenthood,” and reproduced in *The New Horizon in Love and Life* (1921), a posthumous collection of her writings. In these works Edith Ellis, herself lesbian, reached for a vision of eugenics in which ‘unfit’ eugenic subjects were afforded significant roles to play within the cultural improvement of the race and the production of eugenically sound children—nothing less, in fact, than “spiritual parenthood” (as Cohler draws out, the race is invariably white English). “Even in abnormality,” Edith Ellis wrote, “in its congenital manifestations, Nature may have a meaning as definite in her universal purpose as the discord is in music to the musician.”⁸³ Inverts were her main example of “abnormal” types who, while eugenics required them to refrain from having children, could nonetheless “[a]dd to our list of healthy physical children a list of spiritual children.”⁸⁴

Edith Ellis’s brand of queer eugenics is conceptually interesting but is also highly idiosyncratic and had little obvious impact in Britain beyond a small group of radical sex reformers. Of greater import is the impact of pernicious eugenic texts by leading American and British eugenicists, as well as English translations of continental eugenic texts. In the Anglo-American world, such texts provided litanies of physical and psychological ailments which their authors believed could, and should, be wilfully bred out of the human population. Abnormalities of the sex organs featured among these. For example, the prominent American eugenicist Charles Benedict Davenport placed three pathologies of the “reproductive organs” (cryptorchism, hypospadias, and “prolapsus of the uterus and sterility”) among many other pathologies of heredity in his book *Heredity in Relation to Eugenics* (Fig. 4).⁸⁵

⁸³ Ibid., 47.

⁸⁴ Ibid., 65.

⁸⁵ Charles Benedict Davenport, *Heredity in Relation to Eugenics* (London: Williams and Norgate, 1912), 170-1.

recognized—a pedigree recorded by Garrod illustrates the fact. A man who has very severe gout is married to a woman who when 70 years old began to suffer from it. They had 7 children; all have suffered from gout, 5 have died from gout and its various complications; the other two are still living.

39. REPRODUCTIVE ORGANS

a. **Cryptorchism**, or retention and atrophy of testicles. This condition, a semi-“hermaphroditic” one, is characterized by the fact that the normal descent of the testis into the scrotum fails to occur. A pedigree of a family exhibiting this condition is given, in Fig. 150. In the third generation one boy out of four is normal. This trait is probably inherited just like hypospadias.

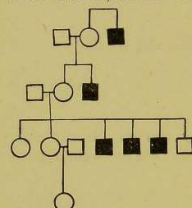


FIG. 150.—Pedigree of cryptorchism. Affected persons represented by black symbols. On account of the sterility of the males all affected persons are derived from sisters of affected persons. All affected persons are natural eunuchs. BRONARDEL, p. 169.

b. **Hypospadias**.—Like the last this is evidence of an imperfect development of the external secondary sex characters and possibly indicates an imperfect stimulus to sex dimorphism. The defect is characterized by the more or less complete failure of the male genital papilla to close along the median raphe up to the apex of the glans. An affected man may have by a wife who belongs to a normal strain some or all of his sons affected. His normal daughters may have abnormal sons even when the father belongs to a normal strain. It seems that there is an inhibitor to complete sex-differentiation in the males. Usually males who show no trace of the inhibitor when married into a normal

strain have normal sons. But occasionally apparently normal fathers in whom the “inhibitor” is inactive may have abnormal sons (Fig. 151.) The eugenical conclusion is that females belonging to hermaphroditic (hypospadiac or cryptorchitic) strains, if married, will probably have at least half of their sons defective, particularly if they have defective brothers; but normal males of such strains may marry females from unaffected strains with impunity.

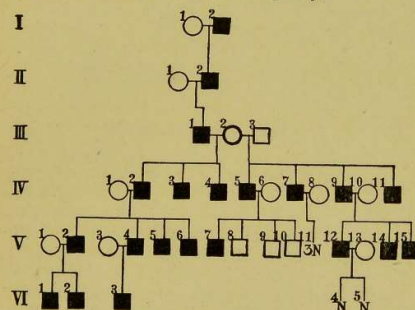


FIG. 151.—Pedigree of hypospadias (black symbols). Inheritance from affected males and unaffected females, III, 2. LANGRISH, 1884.

c. **Prolapsus of the Uterus and Sterility**.—Corresponding in a way with incomplete development of the male reproductive organs is the prolapsus of the uterus in the female. This is also definitely inherited but the trait is never transmitted by affected females since they are sterile (Fig. 152).

40. SKELETON AND APPENDAGES

Since the size and form of the bodily frame are greatly influenced by the skeleton the heredity of these features is

Fig. 4. “The eugenical conclusion is that females belonging to hermaphroditic (hypospadiac or cryptorchitic) strains, if married, will probably have at least half of their sons defective, particularly if they have defective brothers; but normal males of such strains may marry females from unaffected strains with impunity.” From Charles Davenport’s *Heredity in Relation to Eugenics*.

The work was originally published in the United States by Henry Holt and Company in 1911 and then in Britain by Williams and Norgate in 1912. Although prevailing concepts of “sexual inversion” and “homosexuality” were often understood as sex intergrades and might therefore be implicitly included within such categories as hermaphroditism in eugenic discourse, they tended either not to be explicitly referred to in such texts or afforded little attention. In his notorious *Trait Book* (Eugenics Record Office, Bulletin No. 6, 1912) Davenport included (alongside “Narcotism”) “Nymphomania,” “Sex immorality,” and “Sex perversion” within a category (no.

317) labelled “Constitutional Psychopathic State.”⁸⁶ Hermaphroditism was listed elsewhere under the category “Reproductive System” (no. 94), which carried subdivisions and consisted of numerous other sex-related entries (including impotence and masturbation).⁸⁷ In the second, 1919 edition of the work, Davenport elaborated his list of the sexological anomalies that appeared under the banner “Constitutional Psychopathic State” to include nymphomania, sex immorality, promiscuity, harlotry, prostitution, erotomania, denudativeness, bestiality, sex aversion, fetishism, sex perversion, homosexuality, masochism, sadism, and sex inversion.⁸⁸ It seems these categories have been directly imported with little by way of elucidation from sexological texts written by late-nineteenth- and early-twentieth century degeneracy theorists, most likely from Richard von Krafft-Ebing’s *Psychopathia sexualis*.

Of British scientists, the unquestioning ease with which leading British biologists such as William Bateson, Leonard Doncaster, and J. Arthur Thomson melded the new genetics with eugenic considerations of human “improvement” makes for some extremely uncomfortable reading today.⁸⁹ Doncaster, for example, explicitly advocated eugenics in his writings, drawing on the eugenically infused statistical studies of Francis Galton and, in particular, Karl Pearson. In the second edition of his *Heredity in the Light of Recent Research* (1912) Doncaster wrote that

⁸⁶ C. B. Davenport, *Eugenics Record Office Bulletin No. 6: The Trait Book* (Cold Spring Harbor, NY: Eugenics Record Office, 1912), 19.

⁸⁷ *Ibid.*, 37.

⁸⁸ Charles Benedict Davenport, *Eugenics Record Office: Bulletin No. 6*, 2nd ed. (Cold Spring Harbor, NY: Carnegie Institution of Washington, 1919), 48.

⁸⁹ On the early development of eugenics in Britain, see, for example, Lucy Bland and Lesley A. Hall, “Eugenics in Britain: The View from the Metropole,” in Bashford and Levine, *Oxford Handbook*, 213-27; Dan Stone, *Breeding Superman: Nietzsche, Race and Eugenics in Edwardian and Interwar Britain* (Liverpool: Liverpool University Press, 2002); Daniel J. Kevles, *In the Name of Eugenics: Genetics and the Uses of Human Heredity* (Cambridge, MA: Harvard University Press, 1995); Lyndsay Farrall, *The Origins and Growth of the English Eugenics Movement, 1865-1915* (New York: Garland Publishing, 1985).

eugenic practices were not yet a matter of “practical politics” but asserted that “there is little doubt that the nation which first finds a way to make them practical will in a very short time be the leader of the world.”⁹⁰

The subject of sexual inversion (or homosexuality) was little discussed by British biologists, at least explicitly, through the Edwardian era. Possibly this may reflect a general prudery in scholarly writing of the period and a stubbornly standoffish attitude towards modernist sexology that gave way only slowly in elite medico-scientific circles as the new biology of sex demanded concerted studies of sex-variant bodies, minds, sexualities, and behaviours. While passionately advocating eugenics in their major works, leading biologists were generally cagey about delineating precisely which characteristics, especially psychological and behavioural, they wanted eliminated from the population, preferring instead to deploy more emotive and vague euphemisms and other terms such as “vice” and “criminality”. In this way, so-called sexual “perversions” became eugenicised by default. In his 1906 book *Heredity*, J. Arthur Thomson wrote of “sexual vice” (along with hyper-nutrition, absence of “love marriages”, celibacy, and “selfish non-maternity”) as dampeners on the fertility of the “fittest”.⁹¹ Addressing the seventy-fourth annual meeting of the British Association in Cambridge in August 1904, William Bateson spoke of the ability of a “competent breeder” to breed out several “morbid diatheses”. He continued: “As we have got rid of rabies and pleuro-pneumonia so we could exterminate the simpler vices.” The remark is vague but his subsequent sentence strongly suggests that his “simpler vices” included those which infringed prevailing moral standards: “Voltaire’s cry ‘Écraser l’infâme’ (crush the

⁹⁰ Leonard Doncaster, *Heredity in the Light of Recent Research*, 2nd ed. (Cambridge: University Press, 1912), 51.

⁹¹ Thomson, *Heredity*, 535.

infamous) might well replace Archbishop Parker's table of Forbidden Degrees, which is all the instruction Parliament has so far provided."⁹²

Bateson repeated the sentiment in the striking eugenic vision, a veritable call to arms, that concludes his 1909 book (aside from appendices) *Mendel's Principles of Heredity*, stating: "Some serious physical and mental defects, almost certainly also some morbid diatheses, and some of the forms of vice and criminality could be eradicated if society so determined."⁹³ The section, and the main part of his book, concluded thus: "Genetic knowledge must certainly lead to new conceptions of justice, and it is by no means impossible that in the light of such knowledge public opinion will welcome measures likely to do more for the extinction of the criminal and degenerate than has been accomplished by ages of penal enactment."⁹⁴ Criminals and degenerates came in many forms in Edwardian Britain but, for many, homosexuals were chief among them.

The complex, often nebulous, ways in which sex variations became embroiled with pernicious eugenic ideas and practices at this time are further exemplified by the sex-related studies of Geoffrey Watkins Smith, the young fellow and tutor of New College, Oxford and lecturer and demonstrator in Oxford's Department of Zoology and Comparative Anatomy, mentioned above in relation to his collaboration with Rose Haig Thomas. Smith is another British biologist who is currently neglected in historiography and who has not previously been considered as a significant sexologist. Yet his sexological papers were enormously influential, especially his study on the castrating effects of marine parasites on crustaceans.

⁹² *Report of the Seventy-Fourth Meeting of the British Association for the Advancement of Science Held at Cambridge in August 1904* (London: John Murray, 1905), 589.

⁹³ Bateson, *Mendel's Principles*, 305.

⁹⁴ *Ibid.*, 306.

This line of scientific enquiry began with observations by the French zoologist Alfred Mathieu Giard. Building on Giard's work, F. A. Potts, lecturer in zoology and fellow of Trinity Hall, Cambridge, made a major study of parasitic castration in the hermit crab, published in 1906.⁹⁵ Around the same time, but independently of Potts, Smith began publishing on the biology of sex. Most notably, he conducted a major study of *Rhizocephala*, a parasitic crustacea derived from barnacles that infest various crab species and other large crustaceans. Smith established how *Rhizocephala* infected crabs, entering their bodies as tiny larvae by penetrating the base of a hair and then developing inside its host by growing a network of root-like threads within the crab's body to absorb nutrients. Once established, the parasite develops a sac containing both testes and ovaries which protrudes from the abdomen of the host crab.

Two aspects of this phenomenon particularly interested Smith. Firstly, the appearance of tiny "complemental" males, long familiar to biologists from Charles Darwin's seminal study on barnacles, that fix themselves to the protruding sac but which are superfluous to reproductive requirement among *Rhizocephala* (which self-fertilises). Another intriguing observation Smith made was the castrating effects that the parasite has on the crabs it infects. Changes are wrought in infected crabs of both sexes, with the sexual organs degenerating partially or totally, but in male crabs this also involves a dramatic transformation of secondary sexual characteristics whereby all the male characteristics are lost and all the female characteristics are assumed. In some cases, the internal reproductive organs of the sex-transformative males regenerate as fully functioning female organs. Infected female crabs do not assume

⁹⁵ F. A. Potts, "The Modification of the Sexual Characters of the Hermit Crab caused by the Parasite *Peltogaster* (castration parasitaire of Giard)," *Quarterly Journal of Microscopical Science* 50 (1906): 599-622.

male characteristics, but the parasites do induce young female crabs to assume female characteristics prematurely. Smith determined that the physiology of the nutritive and metabolic properties of the parasite effectively acted on its male host as an ovary acts on a female. He did not subscribe to hormonal theories at all.

Smith sought to relate his analysis to the new Mendelism. While accepting that sex was determined by the gametes before development, his study of parasitic castration suggested that this determination “is within certain limits of an elastic character.”⁹⁶ Referring to observations of two types of spermatozoa (by Hermann Henking, Clarence Erwin McClung, and Edmund Beecher Wilson), Smith wrote:

If we suppose that the two kinds of spermatozoa represent the male and female sex respectively, while the eggs are purely female, we would obtain in the process of sexual generation $\frac{1}{2}\text{♂} + \frac{1}{2}\text{♀}$, in which the male spermatozoa united with female eggs give rise to males of really hermaphrodite constitution, while the female spermatozoa united with female eggs give rise to females of purely female constitution.

It is obvious that this interpretation is in strict agreement with the main conclusion brought out in this chapter, viz. that males are potentially hermaphrodites, while females are incapable of assuming male characters. It is doubtful, however, whether this particular “Mendelian” interpretation can be applied generally, because in some animals, e.g., the Bee, it appears that the egg by itself is male and only becomes female through fertilization, while in many Cladocera and Aphids females give rise parthenogenetically to males.⁹⁷

It is particularly notable here that Smith refers to male heterozygosity as a “hermaphrodite constitution” that stands in contrast to the “purely female constitution” of the female.

Smith made several other original and influential sexological studies. His eleven-part series titled “Studies in the Experimental Analysis of Sex,” serialised in the *Quarterly Journal of Microscopical Science* between February 1910 and

⁹⁶ Geoffrey Smith, *Rhizocephala* (Berlin: R. Friedländer, 1906), 89.

⁹⁷ Ibid.

September 1914, is considered among the most original and significant publications of a career that was sadly cut short when he was killed in action in July 1916.⁹⁸

Although most of his sexological studies were confined to specialist scientific journals, and made little reference to humans, there is indication that—just prior to his war service and untimely death—Smith was making a move towards a broader cultural dissemination of his research. One of his last publications was an article entitled “A Contribution to the Biology of Sex,” published in the *Eugenics Review* in April 1914 and based on an address he had just made to the Eugenics Education Society. The piece is interesting on several fronts. Smith’s intervention demonstrates the close resonance of eugenics with the age-old allure of sex selection and the broader ideological context within which sex variations were framed by Britain’s intelligentsia—a context shaped by new developments in genetics and endocrinology that were geared towards realising the prospect of elite biological control of hereditary outcomes (including the sex of offspring) and therefore human progress. Ostensibly, Smith himself was guarded in his approach, cautioning at the top of his paper that his scientific studies, or science more generally, held no inherent social or eugenic doctrine or practical relevance to racial improvement (“at present”).⁹⁹ Nonetheless, he believed that his study of Rhizocephala could help establish such an ideological framework for drawing conclusions, and deriving eugenic practices, about human sexual relations.

Most strikingly, Smith associated his research on the parasitic Rhizocephala with Élie Metchnikoff’s theory of biological and evolutionary “disharmonies.” This included, in Smith’s words, “all the ills that human flesh and spirit are heir to”, and

⁹⁸ For a complete listing of Smith’s publications, see Dorothy V. White, *Geoffrey Watkins Smith* (Oxford: Printed for Private Circulation, 1917), 216-19.

⁹⁹ Geoffrey Smith, “A Contribution to the Biology of Sex,” *Eugenics Review* 6, no. 1 (1914): 18-35, 18.

that Metchnikoff had described in his book *The Nature of Man* (translated by Peter Chalmers Mitchell), discussed in the previous chapter of this thesis.¹⁰⁰ Metchnikoff had suggested that component aspects of sex anatomy and physiology in humans and non-humans, as well as plants, were especially subject to various natural “disharmonies”, wrought by the rigours of evolutionary change. It was with reference to this aspect of Metchnikoff’s theory that Smith discussed his study of Rhizocephala, along with a striking allusion to “disharmonies” in humans:

In the matter of the sexual economy of animals and plants we meet with many marvellous and perfect adaptations for securing the propagation of the species and for ensuring cross-fertilization: of the existence of disharmonies, which in the case of man we must admit to occur, there has hitherto been little or no evidence in natural species, but a case to which I have paid a good deal of attention has suggested to me that the radical changes in sexual economy which many organisms have undergone as the result of alterations in their mode of life have ended in endowing some of them with very anomalous and disharmonious characteristics. Specialisation and success in regard to one set of conditions may bring an organism into such a position that many of its properties, which were suited to a less specialised mode of life, become useless and even harmful, and yet are not eliminated owing to the almost perfect adaptation of the organism in other directions, and this appears to be as true of natural species as of civilised man.¹⁰¹

Metchnikoff, unlike Smith, believed that “disharmonies” of sex and reproduction in humans encompassed non-reproductive sexual behaviours, including masturbation and homosexuality. Smith referred to Metchnikoff’s general premise that “civilisation” had created a mismatch between the age of maturity and the age at which marriage was permitted, but he was otherwise elusive about what constituted the “disharmonies” of sex and reproduction in humans, or at least left his audience to consult Metchnikoff’s book to find out for themselves. Instead, Smith relied on some draconian (and non-scientific) rhetoric, including the term “evil,” to align himself

¹⁰⁰ Ibid., 23.

¹⁰¹ Ibid.

and his science with the hegemonic moral norms of his audience. For example, he stated:

[...] I would first point out that the period of adolescence when the sexual nature of man is developed is a period when the character is largely in process of formation and the restraining power of the reason is not at its strongest pitch, and then ask you to consider what proportion of the kind of evil we are dealing with is in its origin engendered in early youth or even childhood. If that proportion is considerable, a heavy responsibility rests upon a nation of protecting its youth from the evil results of this disharmony of human nature, results which may be incident everywhere, but, perhaps, nowhere more markedly than in the overcrowded dwellings of town and country.¹⁰²

Elsewhere (actually, at the end of the article, as he sought to excuse his focus on subjects that might be considered unseemly), Smith again deployed suggestive rhetoric to indicate without explicitly stating that his primary concern was with “disharmonies” of human sexual behaviour:

If it may seem that I have dwelt solely on the lower, material, and perhaps somewhat repellent aspects of the subject, my excuse is that while lofty and beautiful things have little to gain and perhaps something to lose by being subjected to a scientific analysis, the harsh, confused and repellent facts attain a certain dignity and become more tolerable when they are seen, however dimly, as necessary parts of a cosmic order.¹⁰³

It was largely through such rhetorical manoeuvring that Smith worked to maintain long-standing admonitions against non-reproductive sex variations while accepting that such variations were not unnatural as such and had been developed within animal evolution. His solution to humanity’s alleged “disharmonies”, however, was demonstrably different to that of Metchnikoff (who had only suggested dietary remedies). Despite the concerted rhetorical posturing at the top of his article—in

¹⁰² Ibid., 27.

¹⁰³ Ibid., 35.

which he claimed that science held no intrinsic social or eugenic prescriptions—Smith clearly envisaged eugenic solutions to the “evils” of humanity, a prospect that undoubtedly met with approval from much of his audience.

The notion that variations of sex that had naturally evolved could still be considered as abnormal in the minds of Edwardian scientists was taken to further extremes in Smith’s address to the Eugenics Education Society, as he related his analysis to the broader phylogenetic question of why, in certain species, females are more brightly coloured than males. He wrote: “It appears that this transference or shifting of characters from one sex to the other has played an important part in the evolution of many species.”¹⁰⁴ He also used the term “inversion” to describe this phenomenon. Darwin had discussed the phenomenon in certain avian species (including the painted snipe, Indian quail, cassowary, and emu) in *The Descent of Man*.

In his 1913 book *Problems of Genetics*, William Bateson had also discussed such occurrences in the context of Mendelian inheritance.¹⁰⁵ He described examples of local varieties of certain avian and insect species which differed significantly in their secondary sexual characteristics. In some the males are more brightly coloured than females; in others, both females and males are similarly brightly coloured; and others still, both males and females are similarly dully coloured. For his part, Smith studied this “transference” or “shifting” or “inversion” of sex characters within the evolution of a species in certain insect species. He wrote: “These few instances show us in a striking way how secondary sexual characters may be transferred from one sex to the other in the course of evolution, leading sometimes to the assimilation of one sex to the other, and in certain cases to the complete inversion of the usual

¹⁰⁴ Ibid., 33.

¹⁰⁵ William Bateson, *Problems of Genetics* (New Haven: Yale University Press, 1913), 119-22.

condition.”¹⁰⁶ Smith worked to delineate two distinct processes that caused variations of secondary sexual characteristics within a particular species. The first occurred when an individual exhibited “abnormal” secondary sexual characteristics due to some abnormality of the gonad acting on correlated characters. The second process occurred when an individual “may exhibit abnormal characters owing to hereditary shifting or transference of factors without there being any abnormality of the reproductive gland at all.”¹⁰⁷ This latter process (“this latter kind of abnormality”), Smith wrote, chiefly concerned noncorrelated characters.¹⁰⁸

Did this “transference” or “inversion” apply to humans? Smith continued:

In man most of the secondary sexual characters, indeed, many adult characters apart from sexual differences, such as the formation of the skeleton, are to some degree correlated with the development of the reproductive gland; and for the full normal development, psychical as well as bodily, of an adult human being of either sex, the presence of a normal reproductive system is necessary. Owing to the profound and far-reaching nexus between the development of the general characters of the body and mind on the one hand and of the reproductive system on the other, we should not expect to find a great deal of hereditary shifting of these characters from one sex to the other, though such a process is by no means impossible, and probably does occur to some degree. There is, however, practically no scientific knowledge of it.¹⁰⁹

On this matter, Smith was therefore suggestive but noncommittal. Undoubtedly though, under his (and Metchnikoff’s) influence, the issue assumed immense importance, although in a very different way to Smith, for one of his students at Oxford, Julian Huxley, an important development in British interwar sexological history that is discussed further in the next chapter of this thesis.

¹⁰⁶ Ibid., 34.

¹⁰⁷ Ibid.

¹⁰⁸ Ibid.

¹⁰⁹ Ibid., 35.

3. “Unresolved Conflicts about Sex” in Interwar Britain

In such questions as these of sex-relations, we tend to have an unconsciously-held theory of our own, based upon every-day experience of our own species and of domestic animals; and not merely that, but since the questions are in Man associated with morality, we tend to see what we want to see, even in animals.

—Julian Huxley (1916)¹

The rapidly growing scientific and cultural hegemony of Mendelism, genetics, and endocrinology ensured that the biological sciences came to dominate the sexological arena in interwar Britain. As outlined in the introduction, historians of biology including Adele E. Clarke, Sarah S. Richardson, and Chandak Sengoopta have described how the centre of focus of the new “reproductive” physiology steadily shifted from Britain to the United States after 1910. Clarke, for example, has identified two broad stages in this process.

The first was a period of discipline formation between 1910 and 1925, during which time the disciplinary efforts of American biologists, most notably Frank Rattray Lillie, centred around questions relating to sex endocrinology. The second stage, between 1925 and 1940, Clarke describes as a period of coalescence when American “reproductive” science established its global supremacy in the field with the hefty financial backing of the National Research Council Committee for Research in Problems of Sex (NRC/CRPS). Emblematic of this supremacy was the publication of the landmark volume *Sex and Internal Secretions: A Survey of Recent*

¹ Julian S. Huxley, “Bird-Watching and Biological Science: Some Observations on the Study of Courtship in Birds,” *Auk* 33 (1916): 142-61 and 256-70, 148.

Research (1932; 3rd ed. 1961), edited by Edgar Allen (3rd ed. by William C. Young).²

As outlined in the introduction of this thesis, Sarah S. Richardson has previously scrutinised the gendered assumptions of twentieth-century genetics, charting how the X and Y chromosomes emerged as synecdoches for highly stereotyped notions of femininity and masculinity. To Richardson's analysis can be added a source from Britain, identified during my research for this thesis, that illustrates how gender stereotypes were projected on to the X and Y chromosomes, not just within scientific communities but more popularly. It is a comical poem entitled "The 'Scientific' Lover" by the educationalist and writer Cloudesley Brereton, published in the journal *Science Progress in the Twentieth Century* in January 1921:

From the Laboratory he came
And in Love's incandescent flame
Annealed his soul; of chemic school
Alumnus, he reduced to rule
And theorem, every excellence
To which his Love could make pretence.
And first he strove to analyse
The prismic colours of her eyes,
And when he stroked her waving hair,
On the electric fluid there
He made deductions; each sensation
Provided him a new equation.
And when he kissed her in the dark
He calculated out the arc
Her lips described, correcting it
When she the tell-tale gas relit;
And when she raised her under-jaw,
Applying each kinetic law
He found in n and r and a
Her masticating formula.

Her shapely figure does but serve
As typic of some lovely curve;

² Clarke, *Disciplining Reproduction*.

And when about her voice he raves,
His mind is full of tonic waves;
Weeps she, he finds her tears ancillary,
To thinking out of things, capillary;
And since he finds her, like her sex,
A mystery, he calls her 'x.'
And when to get him she doth try
To name the day, he answers, Why? (y)³

Developing Richardson's analysis further, this thesis argues that the gendering of sex chromosomes with stereotyped female and male characteristics should be understood in conjunction with the ever increasing complexities, and queerness, of interwar genetics. Previous chapters of this thesis have explored how the queer possibilities of binary genetics were imagined from the earliest discovery of the "sex" chromosomes as the first modern geneticists sought to explain all manner of intersexualities, sex metamorphoses, and non-reproductive sexual behaviours. Sex endocrinology facilitated ever queerer permutations of sex biology. There undoubtedly remains more to discover about how biologists approached the variations of sex, especially in the United States where "reproductive" physiology flourished so dramatically after 1910. A continued focus on the situation in Britain, however, remains useful for highlighting the central importance of sex variations, and especially intersexualities and transformations of sex, to the pursuit of sexological biology through the interwar era (the following chapter examines the specific issue of homosexuality). Marsha L. Richmond has previously provided some indication of this in her study of Richard Goldschmidt's genetics (much of which was published in English in America), noting that Goldschmidt's "balance theory" of sex determination, outlined in the introduction and further in the second chapter of

³ Cloudesley Brereton, "The 'Scientific' Lover," *Science Progress in the Twentieth Century* 15, no. 59 (1921): 455. Brereton's italics.

this thesis, was particularly well received among British biologists, especially by F. A. E. Crew and Julian Sorell Huxley.⁴

This chapter shows how, despite being eclipsed by the development of “reproductive” physiology in the United States, modernist sexological biology continued to provide the impetus for a broad transformation in intellectual and cultural attitudes towards sex differences and sexualities in interwar Britain. The chapter continues to develop a primary argument of this thesis, already established for the Edwardian era, that evolving biological models of sex differences and sexualities accommodated all manner of intersexualities, transformations of sex, and non-heteronormative sexual desires and behaviours—both human and non-human—simultaneously presenting challenges to long-standing theological and legal strictures against sex variations, and prompting idealised representations of dualistic gender and opposite-sex marriage.

The chapter also advances another main innovation of this thesis, which is to chart the rampant popularisation of sexological biology through the interwar era, thereby connecting with David Andrew Griffiths’s, Alison Oram’s, and Clare R. Tebbutt’s (separate) studies of the emergence of “sex change” (Griffiths and Tebbutt)/“gender-crossing” (Oram) stories in the popular press through the 1930s, discussed in the introduction to this thesis. One of the key contributions this thesis makes is to articulate a more nuanced model of the relations between professional and popular science writing. In its introduction I outlined what I call the *adaptationist* model of science popularisation which emphasises how popular and semi-popular platforms were used in different ways, both in style and content, to those afforded by specialist medico-scientific platforms. Some further elucidation

⁴ Richmond, “The Cell as the Basis for Heredity,” 169-211.

was provided in the previous chapter relating to the 1913 article in *The Times* which reported the sexological studies being pursued at the Royal College of Surgeons. Huxley and Crew provide further and, indeed, significantly more substantial case studies.

In both respects—the development of a concerted and inclusive biology of sex variations and the popularisation of sexological biology—Crew and Huxley are pivotal figures of the interwar era and beyond. As such, they constitute the main subjects of this chapter. Curiously, especially given historians’ interest in his studies of avian courtship, Huxley’s close involvement in the biology of sex through the period has garnered relatively little academic attention. As this chapter will demonstrate, his lifelong interest in animal courtship and sexological biology appears to have been prompted, at least in part, by personal anxieties. Huxley himself wrote about his “unresolved conflicts about sex” and his writings on sex are emblematic of these unresolved conflicts. Huxley therefore provides a useful case for further considering Luis Campos’s intriguing study of how the personal lives of scientists shape their science, addressed in the introduction of this thesis, although Huxley proves to be a significantly more ambiguous example than Hugo de Vries and his fellow queer Oenotherologists, who occupy Campos’ attention. My approach to Huxley is therefore more biographical than my approach to the other biologists and their interlocutors discussed elsewhere in this thesis.

The first section of the chapter revisits Huxley’s early ornithological studies, highlighting the influence of Élie Metchnikoff’s theory of “disharmonies”, outlined in the first chapter of this thesis, to Huxley’s theorising and writings. The second section recovers a significant body of Huxley’s writings concerning the genetics and endocrinology of sex determination, sex development, and sexual behaviour that

emerged around 1916 and formed a significant part of his scholarly and popular scientific activities thereafter. Huxley learned the latest theories of sex determination directly from Richard Goldschmidt and Thomas Hunt Morgan, largely siding with Goldschmidt's controversial (and ill-fated) "theory of balance," outlined in the previous chapter of this thesis, which catered for high degrees of sex variations both in morphology and behaviour.

Especially during his period at Oxford as fellow of New College, and senior demonstrator in the Department of Zoology and Comparative Anatomy (1919-25), the biology of sex constituted one of Huxley's leading interests and played a major role in establishing him as one of the twentieth century's most famous public intellectuals and popularisers of science. It was also the first scientific field for which he attempted an overarching synthesis, albeit with little reference to ethology, which was an endeavour at which he excelled and which came to fruition in the 1930s with the so-called "modern synthesis" of genetics and evolutionary thought.

The importance of Huxley's work on sex, however, is by no means only biographical. Even if his original scientific contributions to the subject were minimal, his committed and authoritative interest in sexological biology broke new cultural ground, fully establishing the subject as a legitimate concern of scientists, physicians, publishers, and journalists in Britain after decades of standoffishness, neglect, and obfuscation. Buoyed by Goldschmidt's model of sex differentiation, Huxley made sexology not just acceptable but trendy in modern Britain in a way that earlier sexologists, psychoanalysts, psychiatrists, eugenicists, and sexual purity campaigners had long aspired but largely failed to achieve.

Most original sex-related biological studies pursued in Britain through the 1920s and into the 1930s emanated from the Animal Breeding Research Department

(ABRD), renamed the Institute of Animal Genetics in 1930, in Edinburgh. The third section of the thesis charts the sexological activities of the ABRD. Largely maintained by Crew's interest in intersexualities, and by funding from a wealthy benefactor, the ABRD produced numerous sex-related studies, chiefly concerning intersexualities and transformations of sex in non-human animals. Crew echoed Huxley in using the media to promote himself and the sexological activities of the ABRD, and successfully so. Yet despite pursuing sexological studies productively for over a decade, the "Sex Physiology" section of the ABRD also exemplifies the rapid demise of such studies in Britain, especially following the onset of the Depression.

Julian Huxley and the "Disharmonies" of Avian Courtship

Historians of science have long shown great interest in aspects of Julian Huxley's broad and complex intellectual world. These include his contributions to experimental zoology,⁵ evolutionary biology,⁶ UNESCO,⁷ humanist thought,⁸

⁵ Steindór Erlingsson, "The Costs of Being a Restless Intellect: Julian Huxley's Popular and Scientific Career in the 1920s," *Studies in History and Philosophy of Biological and Biomedical Sciences* 40, no. 2 (2009): 101-8; J. A. Witkowski, "Julian Huxley in the Laboratory: Embracing Inquisitiveness and Widespread Curiosity," in C. Kenneth Waters and Albert Van Helden, eds., *Julian Huxley: Biologist and Statesman of Science. Proceedings of a Conference Held at Rice University 25-27 September 1987* (Houston, TX: Rice University Press, 1992), 79-103.

⁶ See, for example, Emily Herring, "'Great is Darwin and Bergson his Poet': Julian Huxley's Other Evolutionary Synthesis," *Annals of Science* 75, no. 1 (2018): 40-54; Joe Cain, "Julian Huxley, General Biology and the London Zoo, 1935-42," *Notes & Records of the Royal Society* 64, no. 4 (2010): 359-78; Roger Smith, "Biology and Values in Interwar Britain: C. S. Sherrington, Julian Huxley and the Vision of Progress," *Past & Present* 178, no. 1 (2003): 210-42.

⁷ Glenda Sluga, "UNESCO and the (One) World of Julian Huxley," *Journal of World History* 21, no. 3 (2010): 393-418.

⁸ Paul T. Phillips, "One World, One Faith: The Quest for Unity in Julian Huxley's Religion of Evolutionary Humanism," *Journal of the History of Ideas* 68, no. 4 (2007): 613-33.

eugenics⁹ and role as one of the twentieth century's most famous public intellectuals and popularisers of science.¹⁰ Huxley's early contributions to field ornithology and academic ethology are also well known to have been foundational in establishing his career as one of the twentieth century's best-known scientists.¹¹

Noting that Huxley frequently related observations of animal behaviour to humans, several historians have sought to situate his ornithological work more assuredly in his personal and social contexts. John R. Durant has highlighted continuities between Huxley's early descriptions of avian courtship and the popular genre of Edwardian animal morality tales which often presented birds as models for human behaviour. Durant argues that Huxley's rampant anthropomorphism was facilitated by his commitment to a direct relationship, "a monistic evolutionary philosophy", between animal mind and human psychology.¹²

⁹ See, for example, R. S. Deese, *We Are Amphibians: Julian and Aldous Huxley on the Future of Our Species* (Oakland, CA: University of California Press, 2015); Paul Weindling, "Julian Huxley and the Continuity of Eugenics in Twentieth-Century Britain," *Journal of Modern European History* 10, no. 4 (2012): 480-99; Elazar Barkan, "The Dynamics of Huxley's Views on Race and Eugenics," in C. Kenneth Waters and Albert Van Helden, eds., *Julian Huxley: Biologist and Statesman of Science. Proceedings of a Conference Held at Rice University 25-27 September 1987* (Houston, TX: Rice University Press, 1992), 230-37; Garland E. Allen, "Julian Huxley and the Eugenic View of Human Evolution," in C. Kenneth Waters and Albert Van Helden, eds., *Julian Huxley: Biologist and Statesman of Science. Proceedings of a Conference Held at Rice University 25-27 September 1987* (Houston, TX: Rice University Press, 1992), 193-222; Diane B. Paul, "The Value of Diversity in Huxley's Eugenics," in C. Kenneth Waters and Albert Van Helden, eds., *Julian Huxley: Biologist and Statesman of Science. Proceedings of a Conference Held at Rice University 25-27 September 1987* (Houston, TX: Rice University Press, 1992), 223-29.

¹⁰ See, for example, Erlingsson, "Costs of Being a Restless Intellect"; Bowler, *Science for All*; Peter Bowler, "Experts and Publishers: Writing Popular Science in Early Twentieth-Century Britain, Writing Popular History of Science," *British Journal for the History of Science* 39, no. 2 (2006): 159-87.

¹¹ Erika Lorraine Milam, *Looking for a Few Good Males: Female Choice in Evolutionary Biology* (Baltimore: Johns Hopkins University Press, 2010), 37-43; Burkhardt, *Patterns of Behavior*, 103-26; Mary M. Bartley, "Courtship and Continued Progress: Julian Huxley's Studies on Bird Behavior," *Journal of the History of Biology* 28, no. 1 (1995): 91-108; Simon J. Frankel, "The Eclipse of Sexual Selection Theory," in Roy Porter and Mikuláš Teich, eds., *Sexual Knowledge, Sexual Science: The History of Attitudes to Sexuality* (Cambridge: Cambridge University Press, 1994), 158-83; John R. Durant, "The Tension at the Heart of Huxley's Evolutionary Ethology," in C. Kenneth Waters and Albert Van Helden, eds., *Julian Huxley: Biologist and Statesman of Science. Proceedings of a Conference Held at Rice University 25-27 September 1987* (Houston, TX: Rice University Press, 1992), 150-60.

¹² Durant, "Tension," 154.

Mary M. Bartley has shown that Huxley's early descriptions of avian courtship were shaped by the socio-political agenda he envisioned for humans, especially his commitment to women's suffrage and sex equality, which stood in stark contrast to other British biologists who forwarded evolutionary arguments to bolster traditional perceptions of women as homemakers and mothers. Huxley's choice of avian subjects—focussing primarily on birds such as the redshank and great crested grebe that exhibit little sexual dimorphism—was therefore influenced by his personal and moral outlooks. It was dictated by his desire to extract and promote lessons about the relations of the human sexes, including idealised principles of monogamy, marriage, family, and what Huxley termed “sex-equalisation” of women and men.

While all these and other historians rightly situate Huxley's contributions to the study of animal behaviour firmly in his personal, social, and intellectual contexts, none fully get to grips with the highly vexed place of sex variations within his idealised view of both avian and human sexual relations. In the first volume of his autobiography, *Memories* (1970), Huxley was significantly more candid about his personal sexual anxieties. He described the prevalence of “homosexuality” at Eton and his (unrequited) crush on a schoolmate. Of his experience as a sixth-former, he wrote:

Love affairs can be just as devastating between boys, just as romantic, as between young men and women. The boy I fell in love with was Eric Forbes-Adam. He was really beautiful, with an oval face, fair hair and blue eyes, and a lovely mouth. I was so obsessed by him that on the way to school I would follow at a safe distance, just to have him in view. And of course I wrote poems about him, including one about the ‘Cupid's bow’ of his mouth – it takes time to rid oneself of clichés! It is a terrible thing to recall that in the prime of his life he committed suicide, in one of our embassies in the Middle East. But why? . . . I was not the only one to fall under Forbes-Adams' spell. I remember Alan Parsons clutching the back of a chair on which he was perched and

demanding why we wretched boys should have such violent passions which were impossible to gratify. I mumbled something stupid about inborn biological urges, but it was not very satisfying.¹³

Some anguished homoerotic love poems, and a sketch of his first love, can be found among the Julian Huxley Papers at Rice University (Fig. 5).¹⁴ Huxley also wrote of the psychological blocks he experienced in his first relationship with a young woman while an Oxford undergraduate. These blocks he described as a “battle between sexual attraction and a puritanical sense of guilt, which prevented me from achieving a complete emotional relation with this attractive and uncomplicated girl.” He continued: “The whole climate of the Edwardian age, with its hypocritical suppression of everything ‘nasty’, fostered this conflict between instinct and reason. My schooldays, with their smutty stories and my concern over masturbation, had induced an underlying sense of moral guilt about sex which took me years to outgrow.”¹⁵

While such anxieties are by no means uncommon for a young person of any period, they seem to have hit Huxley particularly hard. He suffered nervous breakdowns throughout his life; the first of these, in 1912, precisely when he began publishing on the courtship habits of birds, he later attributed to “unresolved conflicts about sex”.¹⁶

¹³ Julian Huxley, *Memories* (London: George Allen and Unwin, 1970), 54. Earlier in *Memories*, Huxley seriously confuses homosexuality with the sexualised cultures, involving sexual abuse and rape of young boys, at Eton, a common fault of many twentieth-century writers. He wrote: “And there was homosexuality – not much in College, I think, but there was one house where it was rampant and horrible. This was reported to me years later by a distinguished old Etonian I knew well. ‘Luckily,’ he said, ‘I was large and ugly, but the pretty little boys . . .’ and he broke off. Romantic love, as opposed to physical homosexuality, was common enough. In College, so far as I know, it was purely platonic.” Ibid., 45.

¹⁴ Julian S. Huxley, school notebooks, Box 1. Julian S. Huxley Papers. Woodson Research Center. Rice University.

¹⁵ Huxley, *Memories*, 74.

¹⁶ Ibid., 153.

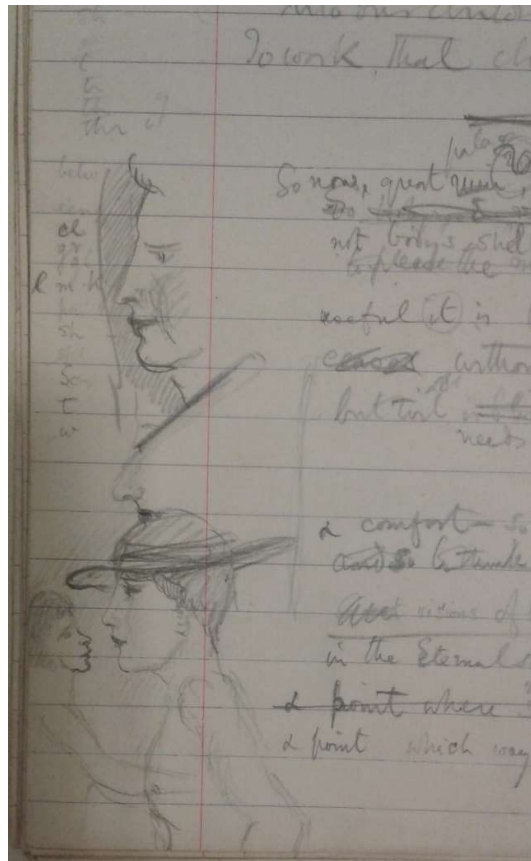


Fig. 5. The schoolboy Huxley not only wrote poetry about the “Cupid’s bow” of his beloved’s lips, but also attempted a few homoerotic sketches. Julian S. Huxley, school notebooks, Box 1, Julian S. Huxley Papers. Woodson Research Center. Rice University.

Huxley’s privileged upbringing, his genuine passion for biology, and his intellectual prowess, placed him in a unique position to investigate, with impunity, the sex-related questions that so vexed him. Notwithstanding any potential sublimation of his personal anxieties, sex-related questions also presented a perfect opportunity for a promising young Edwardian biologist to make his name. His early scientific career was impressive for a young Oxford graduate but had not yet taken off in the way expected—by him and those around him, reasonably or otherwise—of the scientist grandson of the eminent Thomas Henry Huxley.

Huxley's interest in the great crested grebe, and other avian species that exhibit little sexual dimorphism, may also have been prompted by his Oxford zoology tutor, Geoffrey Smith. As discussed in the previous chapter, the transference of sex characteristics in birds concerned Smith in a couple of his studies on the biology of sex, including his collaboration with Rose Haig Thomas and in his 1914 address to the Eugenics Education Society. Huxley's other early scientific interests similarly echoed Smith's, and understandably so. Huxley's first scientific paper, published in 1910 (the year after he graduated) comprised a description of a previously unknown parasite discovered (by Smith) in the liver of Anaspides, the "mountain shrimp" of Tasmania. Following graduation, Huxley spent a year at the Oxford table at the Naples Zoological Station. He was unhappy during his time there but his research nonetheless resulted in further papers on protozoa and the regeneration of cells dissociated from sponges.

Upon his return to Oxford in 1910, Huxley worked as a lecturer at Balliol College and demonstrator in the Department of Zoology and Comparative Anatomy. These were mundane and poorly paid positions (at least by Huxley family standards) but they nonetheless allowed him to pursue his boyhood passion for birdwatching at an academic level. Strikingly, Bartley mentions that one of Huxley's early influences was Élie Metchnikoff (discussed in the first chapter of this thesis), which is continuous with Geoffrey Smith's use of Metchnikoff in his 1914 address to the Eugenics Education Society (discussed in the second chapter). The young Huxley read the second edition of Metchnikoff's *Études sur la nature humaine: Essai de philosophie optimiste* (1903) in its original French; brief handwritten notes can be found in his archive. Of Metchnikoff's acceptance of the principle of primordial

hermaphroditism, Huxley scribbled: “Ch XII to re-read. ridiculous statement that ♂ rudim[entary]. mammary glands represent animal from ♀ stage!”¹⁷

Metchnikoff’s influence on Huxley is evident from the younger scientist’s very first piece of popular science writing, an article titled “The Meaning of Death,” published in the *Cornhill Magazine* (edited by his father Leonard Huxley) in April 1911.¹⁸ With characteristic audacity, and already demonstrating the graceful and endearing style of communicating complex scientific principles that would serve him throughout his career, the piece fused Huxley’s micro studies on unicellular organisms with Metchnikoff’s assertions (and dietary recommendations) on how to extend the human lifespan. Metchnikoff’s influence is also implicit, and twice explicit, in Huxley’s first book, *The Individual in the Animal Kingdom* (1912), which charted the evolution of individuality.¹⁹

Bartley refers to Huxley’s use of Metchnikoff in an intriguing early ornithological study, published in October 1912, entitled “A ‘Disharmony’ in the Reproductive Habits of the Wild Duck (*Anas boschas*, L.)”. The piece records Huxley’s observations, and responses, to the sexual behaviour of mallards on the Tring Reservoirs.²⁰ Huxley remarked that the mallards’ behaviour afforded “a very striking and indeed surprising example, in a wild species and under natural conditions, of what Metschnikoff [*sic*] has taught us to call a Disharmony – a lack of adaptation leading to harmful results for the species”.²¹ Establishing a rhetorical strategy that he would return to in his subsequent work on sex, Huxley initially

¹⁷ Julian S. Huxley, autograph notes on Metchnikoff, *The Nature of Man*, Box 1 (Early Materials), Julian S. Huxley Papers. Woodson Research Center. Rice University.

¹⁸ Julian S. Huxley, “The Meaning of Death,” *Cornhill Magazine* 30 (1911): 492-507.

¹⁹ Julian S. Huxley, *The Individual in the Animal Kingdom* (Cambridge: Cambridge University Press, 1912).

²⁰ Julian S. Huxley, “A ‘Disharmony’ in the Reproductive Habits of the Wild Duck (*Anas boschas*, L.),” *Biologisches Centralblatt* 32 (1912): 621-23.

²¹ *Ibid.*, 621.

outlined what he thought was the usual (or, as he put it, “normal and decent”) reproductive arrangements of mallards.²²

They were, he wrote, a monogamous species and even though the drakes formed into bands (“to lead a lazy bachelor existence”) when the ducks were incubating, they returned to their mates for hours at a time. The “disharmony” in their behaviour occurred when a duck flew its nest and was pursued by numerous drakes. Sometimes this resulted in the lone duck being mobbed back on the water, and violently trodden to such an extent that it drowned. The head keeper of the Tring Reservoirs, James Street, informed Huxley that around seventy drowned ducks were picked out of the water each year and a further number went missing.

Huxley estimated that this represented between seven to ten percent of the mallards on the Reservoirs. He described his own observation of a dense pack of drakes attempting to tread a single duck that became increasingly exhausted, sometimes disappearing under the water for lengthy periods. He shouted at the pack and tried throwing stones to stop the mass treading, but to no avail. Eventually the duck emerged from under the water without being spotted by the drakes and was able to hide in a bush. Huxley was sure that had the attack continued it would have drowned.

Huxley identified the “disharmony” in the constitution of the species as the continuation of the sexual instinct in the drakes through the ducks’ period of incubation. The inability of the drakes to satisfy themselves while the ducks were sitting led to the mobbings he described and a considerable loss to the species. Huxley ended the article with a provocative assertion, that such a “disharmony” was not unique to mallards. He wrote: “Similar fatal results arising from similar

²² Ibid.

disharmonies of the reproductive system are recorded of other species (cf. Judges, XIX, 25).”²³

The story that Huxley cites from the Old Testament book Judges concerns the gang rape of a woman, thrown to a mob by an old man resident in the city of Gibeah, after they demanded to have sex with a Levite who was a guest in his house in order to denigrate him. The woman, the Levite’s concubine, collapses and dies. The story is related approvingly in Judges, as an example of exemplary hospitality—the life of the woman being considered a small price to pay for maintaining the honour of the male guest.²⁴ Huxley’s brief textual reference to the story is telling. It is an unabashed circumlocution—an odd one for a biologist—and it avoids any explicit statement of what is implicit in his reference: that the excessive sexual behaviour of the mob was a natural, if disharmonious, attribute of men.

The reference is therefore another example of Huxley’s pervasive anthropomorphism, perhaps one of the most important in his ornithological studies as it pertains to behaviour which is situated outside his idealised vision of courtship, marriage, and, ultimately, human eugenic progress. Bartley remarks that Huxley rarely mentioned the “disharmony” of the mallards’ behaviour again in his voluminous ornithological writings, preferring to write about grebes and other sexually non-dimorphic avian species that were better fitted to his vision of ideal human sexual relations and eugenic progress (Bartley does, however, mention that Huxley referred to Metchnikoff in certain of his later writings but makes no further analysis). While this is the case, it is not the whole story. Huxley maintained an

²³ Ibid., 623.

²⁴ For a useful exegesis of the story, and other Old Testament narratives of rape, see Anne Katrine de Hemmer Gudme, “Sex, Violence and State Formation in Judges 19-21,” in *The Bible and Hellenism: Greek Influence on Jewish and Early Christian Literature*, ed. Thomas L. Thompson and Philippe Wajdenbaum (Durham: Acumen, 2014), 165-74.

interest in sexual variations and “disharmonies,” these forming an important shaping factor in his studies on animal behaviour and sexual selection and the biology of sex more generally. His thinking on these subjects, however, remained highly conflicted.

The complexities of Huxley’s theories on courtship and mating are nowhere more apparent than in his major study of the great crested grebe. As is well known, “Courtship-Habits of the Great Crested Grebe” resulted from a two-week birdwatching stint at the Tring Reservoirs on the border of Hertfordshire and Buckinghamshire in April 1912, in the company of his younger brother Trevenen. The event transpired to be a milestone in Huxley’s career, since the study he produced out of it, published in the *Proceedings of the Zoological Society of London* in 1914, became one of his most celebrated papers.²⁵ Today, Huxley’s grebe study is recognised by ethologists and others as a pioneering text in situating the study of animal behaviour on a more assuredly professional scientific footing.²⁶

In *Memories*, Huxley claimed with pride that his early ornithological studies “made field natural history scientifically respectable.”²⁷ Historians of science have been more cautious. Burkhardt has argued that Huxley’s early ornithological studies developed from, and largely remained continuous with, the amateur naturalist tradition of Edmund Selous and Henry Eliot Howard (Huxley particularly struggled to differentiate his ornithological studies from those of Selous). If Huxley’s grebe study owed much in content to the earlier observations of Selous, Bartley has observed that the paper owed much in its theoretical approach to Havelock Ellis’s

²⁵ Julian S. Huxley, “The Courtship-Habits of the Great Crested Grebe (*Podiceps cristatus*); With an Addition to the Theory of Sexual Selection,” *Proceedings of the Zoological Society of London* 35 (1914): 491-562. See also J. S. Huxley, “The Great Crested Grebe and the Idea of Secondary Sexual Characters,” *Science* new series 36 (1912): 601-2.

²⁶ For an example of the esteem in which Huxley’s grebe study is now held, see Michael Brooke, “The Courtship Habits of the Great Crested Grebe: Michael Brooke Reappraises Julian Huxley’s Pioneering Classic of Animal Behaviour on its Centenary,” *Nature* 513, no. 7519 (2014): 484-85.

²⁷ Richard W. Burkhardt, Jr., *Patterns of Behavior: Konrad Lorenz, Niko Tinbergen, and the Founding of Ethology* (Chicago: University of Chicago Press, 2005), 103-26.

Man and Woman (1894) which Huxley read in 1911, the same year in which he conducted his renowned observations of grebes and other birds at the Tring Reservoirs.²⁸

Bartley's analysis of Huxley's grebe study is almost wholly based on his observations of the elaborate courtship rituals of the birds. As in their physical appearance, there is little dimorphism in the courtship behaviour of female and male grebes, a situation that presented Huxley with opportunities and challenges. The grebes' reciprocal courtship dances occur after the pair have paired up and before they mate. They are highly distinct sets of behaviours which, Huxley insisted, had a specific purpose of bonding the pair together, bringing the birds into emotional synchrony in preparation for nest building (built by both birds), coition, and incubating eggs. This was, Huxley argued, an exemplar of "ritualisation" in avian behaviour. He freely extrapolated from the occurrence of ritualised behaviours in the grebe to other species, including mammals. Liberal references to Plato, Dante, and Shakespeare's *Romeo and Juliet* aligned human (heteronormative) courtship rituals with the love dances of the grebes.

Although it is clear, as Bartley and others have fervently argued, that Huxley looked to the reciprocal courtship of the grebes as an exemplar for human courtship and monogamous marriage, the case should not be overstated. Huxley in fact commented on "flirtatious behaviour" on behalf of certain grebes towards others who were not their mates, this behaviour occurring, he wrote, "as an accompaniment to their monogamy"(!).²⁹ Here there was also equality—both males or females flirting with outsiders (although he observed marginally more cocks flirting than hens).

²⁸ Bartley, "Courtship," 97.

²⁹ Huxley, "Courtship-Habits," 521. Bartley does remark on Huxley's own infidelities. Bartley, "Courtship," 102-3 n. 54.

Indeed, Huxley allied the behaviour to what he portrayed as normal human behaviour. “The whole thing is very human.” he wrote “when one member of the pair is rather excited and the other is either lethargic or far away, there is no channel for the relief of its excitement. If a bird of opposite sex is in the neighbourhood, however, this would provide the desired relief, and the result is that the ‘temptation’ is often too strong, and a bout of shaking ensues between two birds who are not mated.”³⁰

Such interactions could, he continued, lead to jealous behaviours by aggrieved mates, who chased away the outsider and quickly engaged in a strong bout of shaking with their philandering partner. Again drawing a parallel with humans, Huxley wrote: “Thus all the anger of jealousy is directed against the usurper, not against the mate—which again is distinctly human! The ‘erring spouse’ is always equally ready to shake with his mate as with the *tertium quid*—and often more so.”³¹ Huxley identified flirting as “a slight disharmony”, an overshooting of the mark on behalf of natural selection in evolving a pleasurable and advantageous ceremony.³² Huxley never witnessed the flirtatious behaviour progress beyond bouts of shaking. He wrote that there was no reason why it should not, but that “[a]dultery” was very improbable since the act of coition in the species was intimately associated with nest-building, an activity shared by a bonded hen and cock.

Another significant, but hitherto little analysed, aspect of Huxley’s grebe study casts an altogether different light on his key concepts of “mutual selection” and “sex-equalisation” as historians have hitherto presented them: his inclusion of reverse mating habits (Bartley cites a quotation in which Huxley deliberates on the

³⁰ Huxley, “Courtship-Habits,” 521.

³¹ Ibid. Huxley’s italics.

³² Ibid., 522.

matter but she does not discuss it). As Selous had long identified, the grebes' mating behaviour (as distinct from courtship behaviours, which Huxley treated as reciprocal and without any discernible sex differences in roles), involves two distinct roles or "attitudes" (to use Huxley's term). One bird lies prostrate on top the nest (which Huxley called the "passive" pairing attitude), the other climbs on its back, its body upright (the "active" pairing attitude) for coition, disembarking by waddling forward over its partner's body. Huxley thought the hen was the "passive" party and the cock the "active," but the lack of sexual dimorphism made it difficult to tell and, he admitted, the genital anatomy of birds was such that mating could be successfully accomplished either way. Importantly, Huxley noted, as had Selous before him, that the roles were interchangeable with some pairs repeating the mating behaviour in "reverse" positions. Chunks of his lengthy 1914 grebe paper are dedicated to sorting out "passive" and "active" pairing attitudes. His sense of surprise at the behaviour is palpable in his text:

Sometimes, it is true, the two birds of a pair are almost exactly alike; but nowhere do I find it stated that the hen is ever larger or has a better crest than the cock. It is the part of the professional ornithologist to find out if this is ever so; till then, we must be content to say that it is extremely probable that either cock or hen can play the "active" part in copulation—what we should usually call the male part. This can be more easily imagined in birds than in almost any other animals in which copulation takes place, but even in a bird is remarkable enough. Definite attitudes of the two participating organisms have been evolved to facilitate the passage of genital products in a definite direction: and here, hey presto! although the genital products continue to pass in the same direction, yet the attitudes, developed only in relation with and accessory to this direction, are at will reversed.³³

Huxley aligned the interchangeability with his general theory of "sex equalisation" in the species:

³³ Ibid., 505.

This facultative reversal of pairing-position would certainly be remarkable; but even for the moment supposing that it does *not* occur in our Grebe, it would merely appear as the as yet unattained end of a process of sex-equalization which in this species has already run a considerable course. This process consists in a gradual transference of all the secondary sexual characters of the male to the female, and *vice versa*.³⁴

A bracketed and uncharacteristically apologetic paragraph represents the limits of his analysis, a point-of-no-return with which the young Huxley briefly toyed before regressing.

(I would not trouble to mention the theory that these appearances of characters of one sex in the other are due to descent from a hermaphrodite ancestor, were it not actually the case that Metchnikoff has advanced it. It is enough to point out that if this were so, the primitive mammal must have been a hermaphrodite.)³⁵

Huxley's "mutual selection" and "sex-equalization" therefore collapse into the principle of primordial hermaphroditism, albeit briefly and tentatively. Huxley's comment eschews his earlier (unpublished) ridicule of Metchnikoff's acceptance of the principle of primordial hermaphroditism, but his evident nervousness about mentioning it suggests that he remained conflicted about the notion. He left much unexplored, resting content with a highly questionable model of heteronormative bisexuality whereby individual grebes shared both male and female faculties but only paired in opposite-sex units.

If, as Huxley asserted, the processes of mutual selection and sex equalisation entailed that the secondary sexual characteristics of each sex were developed in the other, would this also not be the case for emotional, psychological, and behavioural characteristics? Avoiding this scenario, which could only lead to complicated

³⁴ Ibid. Huxley's italics.

³⁵ Ibid., 525.

discussions about the vexed subject of homosexuality, at least partially accounts for some of Huxley's protracted and often confusing conceptual manoeuvring pertaining to his courtship studies and interest in sexual selection.

Julian Huxley and the Sexological Biology of "Brideshead" Oxford

Huxley's situation, and his reasoning about avian courtship, developed rapidly in the years following his great crested grebe study. Even before he undertook his renowned birdwatching stint at Tring to observe the grebes, he had accepted the eminent position of assistant professor at the newly established Rice Institute (now Rice University) in Houston, Texas, with the enviable remit of building the biology department from scratch. It was agreed that he would spend a further year studying comparative biology in Germany to prepare for the role, but he made an initial trip to Houston to attend the official opening of the Institute in the autumn of 1912. During this visit Huxley made the acquaintance of some of the most prominent North American biologists, including Thomas Hunt Morgan and Edmund Beecher Wilson. During his year in Germany, he worked with Otto Warburg and Richard Hertwig. The work they set him did not inspire Huxley at all (he could barely remember what it was by the time he wrote *Memories*), although he would later draw on Hertwig's well-known research on sex determination, including his success in controlling the sex of frogs by delaying the point at which eggs were fertilised.

Following the success of his studies relating to avian courtship, Huxley envisaged a more integrated approach to the study of animal behaviour, one that would synthesise the perspectives of both field observations and experimental

zoology. In this endeavour he considered sex-related questions the most pressing, although in practice he failed to assimilate his own ornithological observations of avian courtship with the new biology of sex determination that was developing at a rapid pace on the Continent and in the United States.

Envisaging a unity of purpose, and an audacious project to transform the scientific study of animal behaviour, Huxley began to outline the momentous task of unifying the laboratory-based studies of sex determination with his own studies of avian courtship, derived from field observations. Huxley never completed the project. If he had, as Burkhardt states, the history of ethology would now read very differently. Nonetheless, Huxley made some minor, but innovative moves towards its fulfilment. The first of these is apparent in an article he wrote in the autumn of 1915, and which was published in the *Auk* in 1916. Developing his reasoning from the earlier grebe study, Huxley sought a more unified approach to the study of animal behaviour by calling for greater unity of purpose between amateur naturalists and professional biologists; between factual descriptions of animal behaviour and the major theoretical problems in biology; and between evolutionary, psychological and physiological approaches to animal behaviour. The call for a unified or general biology subsequently became one of Huxley's signature themes, repeated in innumerable contexts in his scientific and popular writings and in television and radio broadcasts. His 1916 paper for the *Auk*, however, took only a small step towards its realisation, seeking to outline the ways in which birdwatching could be elevated to the level of a legitimate science, "the science of the behavior of birds in their natural environment."³⁶ Huxley thought that major questions facing this new science were those connected with courtship; the solutions to these questions

³⁶ Huxley, "Bird-Watching," 269.

requiring a working knowledge of the theories of evolution, theories of sex, and theories of animal mind.

Having made this bold pitch, Huxley fell short in delivery. The main bulk of his article rested on systematising a hierarchy of “marriage” across the natural world by which he projected the “many varieties of marriage” in “Man” (identified as promiscuity, polyandry, polygamy, “and finally monogamy in all its phases of refinement”) onto birds.³⁷ An interesting example of his rampant anthropomorphism occurs when he discusses the grebes. Huxley wrote: “Other birds come more near to the ideal of the women’s movement of to-day; in them both sexes share the duties of the pair more equally, and in all activities realize themselves equally and to the full.”³⁸ He continued:

Let anyone study the relation of the sexes in such birds and compare it with the sex-relation in species with marked sexual dimorphism; then think of what is meant by the logical outcome of the chivalric, mediæval idea of woman’s place, and compare that with the ideal behind the better part of the woman’s movement of to-day, and I believe he will understand what I have in mind, difficult though it be to put into words.³⁹

The evolutionary progression from supposedly primitive stages of “marriage” to complete equality between males and females (be they grebes or suffragettes), often expressed in idealised rhetoric, was for Huxley the guiding principle of his courtship studies—a closely-held ideal which consistently seeped into his broader biological thought, his deep commitment to eugenics and, it could be argued, his personal life.

Huxley briefly alluded to the complex sexual entanglements, or equalisation, that his vision of marriage entailed. “As far as the problems of sex are concerned,” he

³⁷ Ibid., 145.

³⁸ Ibid., 146.

³⁹ Ibid.

wrote, “bird-watching has lead [*sic*] me to important ideas, and has gradually made me believe that in birds at any rate an individual of either sex contains within itself the characters of the other sex in a latent condition.”⁴⁰ It was only in a lengthy footnote to this sentence that he provided some indication of the influence of American biologists (mainly Morgan) and some of the queerer problems raised by their laboratory studies on sex development. Chief among the studies that Huxley outlined were those that had documented changes in secondary sexual characteristics following castration. In his book *Heredity and Sex* (1913) Morgan had established that the sex-determining mechanisms were different in insects, birds, and mammals. Huxley qualified this conclusion by arguing “that all the determinants for the sexual characters of both sexes are present complete in each individual of either sex [...], that this holds good for both birds and mammals, and that the different results in the two groups are due to differences in the method by which in any individual the right characters are brought out, the unneeded ones inhibited.”⁴¹ Importantly, Huxley also stressed that changes in secondary sexual characteristics were closely linked with changes in sexual behaviour. For example, a contact of his, W. M. Minton, had witnessed two examples of bitches who had undergone ovariectomy and had, Huxley wrote, subsequently performed “male actions”.⁴²

Only fleetingly did Huxley relate these relatively new studies with his own ornithological studies, an endeavour he never again pursued. Contrasting sharply with his defence of monogamous marriage that formed the backbone of the main article, Huxley had clearly failed to find a way of assimilating the inherent queerness of the American biologists’ work on sex, much of which involved experiments on the

⁴⁰ Ibid., 144.

⁴¹ Ibid., 144, n. 1.

⁴² Ibid.

transformation of sex in different species, with his idealised vision of avian (and human) marital harmony, derived from field ornithology of certain, carefully-selected bird species that exhibited little by way of sex dimorphism. Indeed, the sidelined queerness of Huxley's footnoted précis of the new biology of sex works to produce the exaggerated idealism of monogamous marriage that is such a prominent feature of the main text.

Huxley's 1916 paper for the *Auk* was one of the very few scientific publications to emanate from his short time at Rice. His psychological restlessness and the disruptions of war entailed his departure that year. Before returning to Britain he spent a short period at the Marine Biological Laboratory at Woods Hole, Massachusetts where he again mixed socially with T. H. Morgan, E. B. Wilson, and other leading American biologists. He also met Richard Goldschmidt who presented his historically-significant work on sex determination in the United States for the first time at Woods Hole on July 28, 1916.⁴³ Goldschmidt's influence on Huxley was not immediately manifest but, following Huxley's return to Oxford in 1919 after war service, became profoundly important—not just for the course of Huxley's career but for the development of sexological biology in interwar Britain.

Huxley returned to England to aid the war effort. He worked briefly for the censor's office before enlisting in the Army Service Corps and then subsequently served as Lieutenant in Army Intelligence on the Italian front close to Padua. After the armistice he served as an Army Education Officer before returning to England at the end of 1918. Early in 1919 he married Juliette Baillot and returned to Oxford, taking up positions as fellow of New College and senior demonstrator in the Department of Zoology and Comparative Anatomy, positions he retained until

⁴³ Goldschmidt's paper was subsequently published as Richard Goldschmidt, "Experimental Intersexuality and the Sex-Problem," *American Naturalist* 50, no. 600 (1916): 705-18.

1925.⁴⁴ He continued his ornithological studies, even pursuing them—he wrote in *Memories*—on his honeymoon, in preference to human mating rituals and to the chagrin of his new wife.⁴⁵

Of his laboratory studies, Huxley's work on metamorphosis in amphibians, pursued upon his return to Oxford, is well known to historians, not least because it is the only laboratory research of this period that Huxley discusses in his memoirs and also because of the sensational reporting which his study generated. Prompted by the earlier experiments of J. F. Gudernatch who had accelerated the development of tadpoles into froglets by feeding them on thyroid gland, Huxley succeeded in inducing metamorphosis in the axolotl (Mexican salamander), a neotenic amphibian which normally retains its gills and remains aquatic in its adult form. By feeding axolotl tadpoles thyroid gland Huxley transformed the creatures into large salamander-like forms, capable of moving out of water, which had not existed in a state of nature for millennia. After his preliminary findings were published in *Nature* (January 1, 1920), they appeared in a leading article in the *Daily Mail* (February 17, 1920) that proclaimed Huxley's "Great Discovery" along with various other sensational announcements ("Thyroid Gland Marvels," "Control of Sex and Growth," "Renewal of Youth"). This article allied his axolotl experiments to other scientific advances which seemed to promise biological control of the vital processes that govern development. The article begins: "The secret of perpetual youth and renewed vigour, the determination of sex, and the curing of certain human diseases are some of the problems illustrated by a series of discoveries now being unearthed

⁴⁴ Juliette Huxley was bisexual and maintained an intimate and long-lasting relationship with the Belgian-born American poet May Sarton. I am grateful to Luis Campos for drawing my attention to this. See May Sarton, *Dear Juliette: Letters of May Sarton to Juliette Huxley*, edited by Susan Sherman (New York: W. W. Norton & Company, 1999).

⁴⁵ Huxley, *Memories*, 123.

principally in laboratories at Oxford.”⁴⁶ A follow-up piece, on February 21, pronounced that Huxley had discovered the “Elixir of Life.”⁴⁷

The story caused a sensation and was echoed in other newspapers and popular publications across the country and abroad, all fortified with equally melodramatic headlines. The *Yorkshire Telegraph and Star* (February 20, 1920), for example, ran with “Secrets of Nature: Discoveries on Perpetual Youth and Renewed Vigour: Miracles of Science”; the *Nottingham Evening Post* (February 20, 1920) declared “Secret of Youth: Great British Scientific Discoveries: Thyroid Gland Marvels”; while the *Leeds Mercury* (February 21, 1920) pronounced “The Elixir of Life and Youth: Oxford Experiments in Rejuvenescence.”⁴⁸ Undoubtedly in part because of his famous name, Huxley became an overnight celebrity—a development he revelled in despite the cautionary advice of friends and colleagues who worried about the exaggerated claims of such reporting. He responded to his sudden renown with his own article for the *Daily Mail* (February 25, 1920), a piece which—as he later wrote in *Memories*—earned him his first income from writing (ten guineas), and set him on the path of penning popular and semi-popular pieces on science for journals and newspapers. It was an endeavour he subsequently pursued with gusto in

⁴⁶ Julian S. Huxley, “Metamorphosis of Axolotl Caused by Thyroid-Feeding,” *Nature* 104 (1920): 435; “A Great Discovery: Thyroid Gland Marvels: Control of Sex and Growth: Renewal of Youth,” *Daily Mail*, February 17, 1920, 7. On Huxley’s thyroid studies and their impact, see Witkowski, “Julian Huxley in the Laboratory,” 100-1; Bowler, *Science for All*, 221-27. Huxley’s role in the appearance of the *Daily Mail* article could be debated at length. In *Memories* he claimed that the interest of the press was aroused “[b]y chance”. The content of the piece, which reflects Huxley’s broader research programme at the time, and the inclusion of a previously unpublished photograph, strongly suggest his close complicity with the piece. Huxley, *Memories*, 126.

⁴⁷ “Secret of Sex: Possibilities of Mr. Huxley’s Great Discovery: “Elixir of Life”: Scientists’ Opinions,” *Daily Mail*, February 21, 1920, 5.

⁴⁸ “Secrets of Nature: Discoveries on Perpetual Youth and Renewed Vigour: Miracles of Science,” *Yorkshire Telegraph and Star*, February 20, 1920, 3; “Secret of Youth: Great British Scientific Discoveries: Thyroid Gland Marvels,” *Nottingham Evening Post*, February 20, 1920, 1; “The Elixir of Life and Youth: Oxford Experiments in Rejuvenescence,” *Leeds Mercury*, February 21, 1920, 14.

the face of further criticism by his fellow scientists.⁴⁹ He lamented the fact that he had to spend much more than ten guineas responding to letters he received from “cranks and sufferers from all over the world”, who wrote to him for advice about his miraculous thyroid treatment; one “pathetic writer” from India demanding to know how he could go about doubling the dimensions of his “under-sized and under-developed male organ”.⁵⁰

While Huxley’s thyroid experiments and the ‘big break’ they afforded him in terms of his media career are well known to historians, the wider context in which they were pursued has not hitherto been recognised.⁵¹ Upon his return to Oxford from wartime service, in the autumn of 1919, Huxley embarked upon a much broader research programme; investigating developmental physiology, and—most importantly for Huxley—questions of how to control it. Much of this work centred on sex reversal and its impact on sex ratio. The ambitious young Huxley recognised that the new biology of sex could help elevate him and his career, significantly so.

That this interest in the biology of sex development formed part of a wide-ranging research programme from the outset, and was not wholly pursued as an offshoot of his studies on the thyroid (as could possibly be assumed from the chronology of his publications) or prompted by his new celebrity status, is indicated from a funding application that Huxley made to the Royal Society. He appealed for

⁴⁹ Julian S. Huxley, “Secrets of Life: Mr. Huxley on his Clues: Speeding-Up Man: Future Experiments,” *Daily Mail*, February 25, 1920, 7. See also Julian S. Huxley, “The Thyroid Gland and the Control of Animal Growth,” *Illustrated London News*, February 28, 1920, 320 and 354.

⁵⁰ Huxley, *Memories*, 127.

⁵¹ This situation is undoubtedly due, at least in part, to Huxley’s highly selective recollections in *Memories* where he progressed from a discussion of his thyroid research and his first foray into the popularisation of science to a new chapter discussing “[t]he next important event in my life”: the 1921 Oxford University expedition to Spitsbergen. While there is no reason to doubt that the elderly Huxley, looking back on his life, did not consider his sex studies of the early 1920s to have had lasting importance, it is nonetheless the case that the two volumes of his autobiography make scant mention of his lifelong advocacy of eugenics. They are, to a very large extent, a whitewash. Huxley, *Memories*, 128.

funds “in order to carry out experiments on a large scale for the purpose of testing the effects of a number of chemical substances & other agencies’ upon a number of phenomena: rate of growth; form assumed (abnormalities, attuned proportions, new types of structure, &c); metamorphosis; sex-ratio; maintenance of any change produced; rate of metabolism; length of life in relation to metabolism; and senescence.”⁵² The application was successful and Huxley was awarded £120 to support his efforts.

Newly married, ambitious, and with valuable first-hand experience of how leading American and German biologists were broaching the subject of sex development, Huxley was ideally placed to make some significant moves in Britain, and this he did. It is of passing, but not wholly irrelevant interest that the Oxford Huxley returned to was very different to his own student days and the time of his earlier academic posts. He pursued the new biology of sex precisely when a new generation of Bright Young People, Harold Acton and Brian Howard chief among them, established Oxford as the epicentre of a new brand of modernist aestheticism—queer chic—which expanded beyond their own clique into a cultural fad, adopted even by those aesthetes who were not, technically, queer.⁵³ Long since styled “the Brideshead generation” by Humphrey Carpenter, the partying and same-sex love affairs of the set are now the stuff of legend. Huxley did not mix with the set or emulate their fashions, although he did contribute poetry to the *Oxford Outlook*—a progressive undergraduate-edited periodical, and the main mouthpiece for Oxford’s flamboyant aesthetes, which occasionally published purposefully ungendered and

⁵² Autograph draft of the application. Box 2, Julian Huxley Papers, Woodson Research Center, Rice University.

⁵³ Works, mainly biographical, which offer useful studies of the set, and further references, include Paula Byrne, *Mad World: Evelyn Waugh and the Secrets of Brideshead* (London: HarperPress, 2009), ch. 3 *passim*; Humphrey Carpenter, *The Brideshead Generation: Evelyn Waugh and His Friends* (London: Weidenfeld and Nicolson, 1989).

even explicitly homoerotic poems and stories.⁵⁴ More pertinently, Huxley undoubtedly benefitted from the wave of youthful optimism and zealous yearning to escape the puritanical stuffiness of the Edwardian era which swept through Oxford like a tidal wave following the traumas of war. The new, relatively tolerant attitude towards sexual variations, and open discussion of sexuality, helped facilitate his investigations into, and popularisation of, sexology in ways that were not previously possible in Britain, and which would have been more difficult elsewhere.

Archived correspondence shows that Richard Goldschmidt was the intellectual force behind Huxley's interest in the biology of sex.⁵⁵ In April 1920, Huxley wrote to reacquaint himself with Goldschmidt for the first time since they had met at Woods Hole in the summer of 1916.⁵⁶ Huxley wrote that at that time he had only been interested in sex determination in a general way. This interest developed further towards the end of 1919 following the publication of an article by Goldschmidt in the *Biologisches Zentralblatt*, Huxley thereafter setting about a study on the sex ratio in fish. He asked Goldschmidt a set of questions and requested some *Lymantria* so that he (Huxley) could test certain hypotheses of his own.

The two men continued to correspond at least until 1940. Goldschmidt himself visited Britain for a lecture tour in 1923 during which time he was Huxley's guest at Oxford and F. A. E. Crew's guest in Edinburgh. On February 17 that year, Goldschmidt also attended the thirteenth meeting of the Genetical Society at the Zoological Museum (now Natural History Museum) in Tring, where he gave what

⁵⁴ Julian S. Huxley, "Thoughts" and "Portrait of a Statesman & Philosopher: By a Young Artist," *Oxford Outlook* 3 (1920): 91 ("Thoughts") and 134 ("Portrait").

⁵⁵ Huxley's letters to Goldschmidt are in the Richard Benedict Goldschmidt Papers, Bancroft Library, University of California. Goldschmidt's letters to Huxley are in the Julian Huxley Papers, Woodson Research Center, Rice University.

⁵⁶ Huxley to Goldschmidt April 8, 1920, Richard Benedict Goldschmidt Papers, Bancroft Library, University of California.

Crew later described as “a fascinating account of his Lymantria intersexes.”⁵⁷

Following the meeting, Goldschmidt stayed as the guest of William Bateson at the John Innes Horticultural Institution at Merton Park, Surrey (now John Innes Centre, based in Norwich). Also in 1923, Goldschmidt’s major sexological book, *Mechanismus und Physiologie der Geschlechtsbestimmung* (1920), was translated into English by William J. Dakin, professor of zoology at the University of Liverpool, and published (by Methuen and Co.) as *The Mechanism and Physiology of Sex Determination*.⁵⁸

Even before he published any academic papers on the subject, Huxley wrote about sex determination and the critical topic of sex “reversal” in popular publications, largely drawing on the published work of other biologists but synthesising such works into an audacious eugenic vision of human progress. His first such piece, an article titled “On Sex-Determination,” was published in the *Daily Herald* (May 24, 1920), a paper aimed at the labour movement and supported by the Trades Union Congress and the Labour Party. The article established key tropes that would come to define Huxley’s approach to the subject. While promoting the chromosomal theory of sex (Huxley guided his readers to Morgan’s 1919 book *The Physical Basis of Heredity* for more about this), he insisted, à la Goldschmidt, that an individual’s chromosomal sex could effectively be entirely overridden during the course of development.

⁵⁷ F. A. E. Crew, “Recollections of the Early Days of the Genetical Society,” in *Fifty Years of Genetics: Proceedings of a Symposium held at the 160th Meeting of the Genetical Society of Great Britain on the 50th Anniversary of its Foundation. Held on 9th, 10th and 11th July 1969 in the University of Reading*, ed. John Jinks (Edinburgh: Oliver and Boyd, [1969?]), 9-15, 14. On Goldschmidt’s visit to Britain, see also Cock and Forsdyke, *Treasure Your Exceptions*, 470-1; Richmond, “The Cell,” 188; Lancelot Hogben, “Francis Albert Eley Crew, 1886-1973: Elected 1939,” *Biographical Memoirs of Fellows of the Royal Society* 20 (1974): 135-53, 138.

⁵⁸ Richard Goldschmidt, *The Mechanism and Physiology of Sex Determination*, trans. William J. Dakin (London: Methuen, 1923).

Under the subtitle “Variant Factors” Huxley discussed how scientists, mainly Richard Hertwig, had succeeded in artificially manipulating the sex of offspring of various species—frogs and toads, birds and moths—in laboratory experiments. Most interesting to Huxley were Goldschmidt’s experiments where two species of moth were crossed, producing some males but also individuals exhibiting both female and male structures. These individuals ought to have been females, Huxley wrote, “but have somehow got switched over to maleness.” From such evidence Huxley was sure that although chromosomes determined sex in ordinary circumstances, there could come to pass “abnormal sets of conditions which will over-ride or influence the chromosomes and turn the switch over to the other side”. In such cases, he wrote, “traces of the sex which the animal ought to have been often persist along with the characters of the sex which it actually is.”

What was the interest of all this to the socialist-minded readers of the *Daily Herald*? In the final section of the piece, subtitled “Sex Control,” Huxley waxed lyrical about the potential for social havoc that was inherent in the new biology of sex. Control of the sex-determining mechanism was, he stated, rapidly coming within reach of biologists. It was likely that it would first become possible to control the production of the sexes in the lower animals, and would be just a matter of time before sex-determining mechanisms could be controlled in the higher animals and then humans. He suggested that in such circumstances, most parents would clamour for boys (some fathers, he thought, would want girls), the War Office would demand boys (their wishes granted when a “militarist government” was in power, refused when a pacifist government was in office), and, he wrote, “[w]e shall have feminists going off and establishing colonies entirely of women to prove that they are as good as men (and probably rather better).” An abundance of males, especially among the

better off sections of society who tend to have fewer children, would, he continued, lead to a lack of wives, meaning that daughters “will once again come to have a marketable value.” In response, the lower classes and “unscrupulous money-seeking parents” would produce only girls to be sold to the highest bidder (“as in savage tribes”). Huxley concluded:

Vista upon vista opens up. They appear farcical or fantastic enough in this world of to-day; but will they still do so in the world of to-morrow—or at least in the world of a generation hence? Once the power of altering the sex ratio has been, as it inevitably will be, discovered, the most appalling chaos—moral, economic, and political—will set in if the matter is left in our ordinary haphazard way to private initiative and choice. It must *not* be so left. Labour must see to it that research becomes a function of the State, and that the discoveries of research shall be under the control of the community, and not either of undirected private whims, nor of Capitalism, nor of tyranny.⁵⁹

In the wider context of his life and career, Huxley’s tone, and the enthusiasm for socialist ideals in his *Daily Herald* article are surprising, most likely reflecting a flirtation with a popular readership as he strived to perfect his public voice in the immediate wake of his new media fame. Huxley’s commitment to radical social progress meant that he had much in common with socialists. However, unlike his contemporaries J. B. S. Haldane, Lancelot Hogben, and many of his friends and correspondents, he never personally identified as a socialist. In other respects, the piece is an early example of the polemical science writing that would come to define Huxley’s long career as a populariser of science and eugenics. What it lacked by way of his own original scientific observations, he more than compensated for with his passionate advocacy of entwined human biological, social, and sexual progress.

⁵⁹ Julian S. Huxley, “On Sex-Determination,” *Daily Herald*, May 24, 1920, 4. Huxley’s italics.

Huxley again broached the biology of sex in the pages of *Discovery: A Monthly Popular Journal of Knowledge*, a new magazine (first published in January 1920) for which he penned several articles, book reviews, and correspondence through its early years. A two-part article entitled “Recent Work on Heredity,” published in the summer of 1920, was his first piece for the publication. The first part, published in July, begins with a summary of the latest advances in genetics derived from microscope studies, providing readily understandable descriptions of chromosomes, genes, cell division, genetic recombination at the moment of fertilisation and heredity, as it was understood at the time. Huxley then described the basics of Mendelian inheritance derived from breeding experiments. He accepted that a viable fusion of the two approaches (i.e., that Mendel’s laws of inheritance operated through the chromosomes) was still to be established for certain, but was convinced of its veracity and efficacy, which he found proof of in Morgan’s studies of *Drosophila*.

Summarising this first instalment, Huxley hoped that his readers would “see that a new way of looking at animals and plants is opened to our intellect.”⁶⁰ By viewing living organisms as combinations of innumerable particles—he used the analogy of two packs of cards being shuffled together at the point of conception—the ability of purposefully combining variations at will in a single breed, he wrote, could be perfected. The occurrence of mutations remained a mystery but one over which he was sure scientists would soon gain mastery. He concluded:

At present we do not know how to produce mutations; but the belief that we shall eventually be able to do so underlies our work, and once we have discovered the way, our knowledge of the laws of heredity will enable us to build up improved races of animals and plants as easily as the chemist now builds up every sort and kind of substance in his

⁶⁰ Julian S. Huxley, “Recent Work on Heredity,” *Discovery: A Monthly Popular Journal of Knowledge* 1 (1920): 199-203 and 233-35, 203.

laboratory. In a word, Mendelism made it possible for us to represent the hereditary composition of an organism by a *formula*. More recent work is making it possible to represent that composition by a *structural formula*.⁶¹

The second part of the article, published in August, broached the inheritance of sex, heredity in humans (“Man”), and more on his eugenic vision of how research into heredity and genetics should proceed. On the inheritance of sex differences, he covered the basics of sex chromosomes as was understood at the time (the Y chromosome considered inactive) and the development of secondary sexual characteristics. As he had in his *Daily Herald* article, Huxley stressed that each individual contained the potential for sexual characteristics of both sexes and, most significantly (since even the mention of homosexuality had previously been taboo in popular science writing in Britain), that this had a direct bearing upon the development of sexuality. He wrote:

We are all therefore double, as far as secondary sex-characters go; but only one set is generally allowed to develop, while the other is kept latent. Sometimes, however, it is not kept completely latent; and so come about the abnormal individuals with a mixture of the psychology of the two sexes, or even a reversal of sex-impulses. They are a problem to the psycho-analysts, and are often looked upon with great moral reprobation by ordinary people. But, in many cases, there can be no doubt that their condition is no fault of their own, but due to some slightly irregular working of part of the machinery of sex-determination.⁶²

The reference to psychoanalysis is pertinent and it is notable that the second part of Huxley’s article in *Discovery* is placed immediately following a piece on psychoanalysis by William Brown, a psychologist at King’s College, London. Huxley’s remarks concerning “reversal of sex-impulses” as an “irregular” biological

⁶¹ Ibid. Huxley’s italics.

⁶² Ibid., 234.

occurrence in humans are therefore situated in juxtaposition to Brown's description of the sexual "perversions" as an unchanged or exaggerated infantile sexuality continued into adulthood.⁶³ It was precisely this kind of ideological and medico-scientific sparring which maintained the new sciences of sex as a leading concern in newspapers and popular journals through the 1920s and beyond in Britain, America, and elsewhere (in America, for example, Huxley's remarks on sex reversal in his piece for *Discovery* were picked up by other publications as diverse as *Current Opinion* and the San Francisco-based *Theosophical Outlook*).⁶⁴ Huxley's influence on the emerging homosexuality debates of the interwar era, as well as that of Crew, are examined in the following chapter of this thesis.

The remainder of the article presses Huxley's eugenic agenda. Positive eugenics, he wrote, was not yet a practical option but with negative eugenics "we might even now accomplish much."⁶⁵ He envisaged a time in the not-too-distant future when biologists would have mapped out the "genetic formula" for each organism (his examples were chiefly agricultural: breeds of cattle, pigs, wheat and potatoes) and could be used to predict the effects of cross-breeding just as a chemist mastered the uses of different compounds. He called for the establishment of a "National Genetical Laboratory", to be run along the same lines as the National Physical Laboratory. He concluded the piece: "What Government will earn fame for itself by daring to extend the Ministry of Public Health to include Eugenics, and that of Agriculture to include Genetical Research?"⁶⁶ Huxley's essentialist model of

⁶³ William Brown, "Psycho-analysis," *Discovery: A Monthly Popular Journal of Knowledge* 1 (1920): 231-32, 232.

⁶⁴ "What Are We?: Why Every Male is a Latent Female," *Current Opinion* 70 (1921): 515; "Why Every Male is a Latent Female," *Theosophical Outlook* 6 (1921): 127. The latter is a verbatim reprint of the piece in *Current Opinion*.

⁶⁵ Huxley, "Recent Work on Heredity," [234; mistakenly typed as 231].

⁶⁶ *Ibid.*, 235.

sexuality, and more particularly his inclusion of sexual “irregular” workings, was therefore cast within the remit of his eugenic vision of human progress from the outset, a significant move that can be shown to be echoed by other British biologists but which has yet to receive concerted attention in historiography.

Huxley’s first comment on sex reversal for an academic publication came in the form of a short letter to *Science*, dated May 1, 1920 and published in July.⁶⁷ He was responding to a communication that had appeared in the journal in March in which the American geneticist Alfred Sturtevant reported the occurrence of intersexuality in *Drosophila simulans* caused by the action of a mutant gene.⁶⁸ Sturtevant cast doubt on the assertions of other biologists (Goldschmidt, Hertwig and Arthur M. Banta) who had claimed that intersexuality was produced by the breakdown of normal sex-determining mechanisms. In his response, Huxley drew attention to various methodological and morphological differences in these studies conducted by the several researchers on different species, not least that Sturtevant had produced just a single grade of intersexuality in *Drosophila simulans* while Goldschmidt had succeeded in producing a continuous series of intersexualities in *Lymantria*. Huxley instead suggested that gene-produced intersexuality, intersexuality produced by an imbalance between genetic and other sex-determining mechanisms (“the balance theory”), and intersexuality produced solely by external factors were not necessarily mutually exclusive.

Huxley’s study on sex ratios in fish was published in the *Journal of Genetics* in December 1920.⁶⁹ More theoretical than substantially observational, he sought to

⁶⁷ Julian S. Huxley, “Intersexes in *Drosophila* and Different Types of Intersexuality,” *Science* 52, no. 1333 (1920): 59-60.

⁶⁸ A. H. Sturtevant, “Intersexes in *Drosophila simulans*,” *Science* 51 (1920): 325-27.

⁶⁹ Julian S. Huxley, “Note on an Alternating Preponderance of Males and Females in Fish, and Its Possible Significance,” *Journal of Genetics* 10 (1920): 265-76. Huxley produced a number of other original studies on sex reversal, often in collaboration with other scientists. See, for example, E. W.

account for dramatic variations in the sex ratio of a group of guppies bred by the English zoologist Edward George Boulenger at the Zoological Gardens in London. Boulenger had earlier (in 1912) observed that for a period of around nine to ten months females outnumbered males by three to one. This subsequently changed for around six weeks during the winter, when the imbalance reversed and there was a preponderance of males, which Boulenger estimated as three to every two females. Thereafter the sex ratio stabilised with roughly equal numbers of females and males. Although precise statistics were lacking, Huxley thought the changes could be accounted for by external factors overriding the sex-chromosome mechanisms of some of the fish.

During 1921, much of Huxley's attention and publishing output was occupied with the Oxford University expedition to Spitzbergen, which he led. He soon returned to the biology of sex determination making his most substantial synthesis of the subject in a well-publicised lecture at the Royal Society of Arts on January 18, 1922, subsequently reproduced in full with illustrations in the Society's *Journal*. Although he still refrained from relating the laboratory studies with his work on avian courtship, Huxley offered a thorough synthetic review of the current status of biological work on sex determination including a thorough analysis of sex reversal.⁷⁰

Numerous reports of the lecture were made in media publications, and under some attention-grabbing headlines, including *The Times* ("Science and Sex"), the *Irish Times* ("Sex Determination: Biologist's Experiments"), the *Daily Mail* ("Reversing the Sexes: Prof. Huxley Says It Will Be Possible"); the *Daily Mirror* ("Reversing the Sexes: 'A Practical Possibility,' Professor Says: Experiments in 3

Sexton and Julian S. Huxley, "Intersexes in *Gammarus chevreuxi* and Related Forms," *Journal of the Marine Biological Association of the United Kingdom* 12 (1921): 506-56.

⁷⁰ Julian S. Huxley, "Some Recent Advances in the Biological Theory of Sex," *Journal of the Royal Society of Arts* 70 (1922): 188-202 and 206-20.

Countries”), the *Manchester Guardian* (“Changing the Sex: A Possibility of the Near Future”), the *Nottingham Evening Post* (“Reversal of Sex: Prof. J. S. Huxley & a Strange Possibility: The Cards of Life”), the *British Medical Journal* (“The Determination of Sex”) and the *Graphic* (“The Third Sex in Music”). The last of these entailed Ernest Newman taking the opportunity presented by Huxley’s lecture to wax lyrical on “the woman-man in art”, spotlighting Chopin in this regard.⁷¹ It was a sprawling discourse, the first substantial media event promoting sexology in interwar Britain. It represents a point of critical mass after which news stories about scientific studies on unusual sex phenomena in non-human animals maintained a regular presence in Britain’s newspapers and popular magazines.

Huxley’s subsequent writings on sex span his remaining time at Oxford, continuing to traverse a wide spectrum of academic, semi-popular, and popular publications. Most significantly, he followed up his paper for the Royal Society of Arts with another major review article titled “Sex-Determination and Related Problems” for the Medical Research Council’s periodical *Medical Science: Abstracts and Reviews* in May 1924.⁷² The pioneering nature of Huxley’s review of the field for British medical professionals is captured by an anonymous writer for the *Lancet* who enthused that “the Medical Research Council takes the wide view which enables the readers of its journal to familiarise themselves so conveniently with the present state of knowledge in a subject which has advanced with bewildering rapidity and

⁷¹ “Science and Sex,” *The Times*, January 19, 1922, 7; “Sex Determination: Biologist’s Experiments,” *Irish Times*, January 20, 1922, 4; “Reversing the Sexes: Prof. Huxley Says It Will Be Possible,” *Daily Mail*, January 19, 1922, 5; “Reversing the Sexes: ‘A Practical Possibility,’ Professor Says: Experiments in 3 Countries,” *Daily Mirror*, January 19, 1922, 2; “Changing the Sex: A Possibility of the Near Future,” *Manchester Guardian*, January 19, 1922, 7; “Reversal of Sex: Prof. J. S. Huxley & a Strange Possibility: The Cards of Life,” *Nottingham Evening Post*, January 19, 1922, 3; “The Determination of Sex,” *British Medical Journal*, January 28, 1922, 157-58; Ernest Newman, “The Third Sex in Music,” *Graphic*, January 28, 1922, 94.

⁷² Julian S. Huxley, “Sex-Determination and Related Problems,” *Medical Science: Abstracts and Reviews* (May 1924): 91-124.

has almost endless medical implications.”⁷³ Of popular and semi-popular platforms (aside from pertinent book reviews and correspondence), Huxley penned a two-part article (“Sex and Its Determination”) for *Discovery* in the summer of 1922, reproduced (as “The Determination of Sex”) in Huxley’s *Essays in Popular Science* (1926).⁷⁴ A paper (“Sex Biology and Sex Psychology”), initially read to the BSSSP in October 1922, was published in Huxley’s *Essays of a Biologist* (1923).⁷⁵ He wrote other pieces for publications as diverse as *The Child: A Monthly Journal Devoted to Child Welfare* (“Human Sex-Determination”) in April 1922, the *Weekly Westminster Gazette* (“Sex Reversal”) in September 1922 and the *Spectator* (“Sex-Determination”) in August 1924.⁷⁶

Huxley’s fame also caught the attention of Mr. Punch whose delightful “Millennial Musings” on July 5, 1922 poked fun at Huxley’s eugenic vision of human destiny, including a sly dig at his interest in the biology of sex (strikingly expressed as reifying Freud). Envisaging a future when humans “with new-fangled features” and “glands engrafted” would eclipse even the weirdest creatures, the poem reads:

This, believe me, is no wild chimæra
 Bombinating in a formless void;
 No, the dawning Julian (HUXLEY) era
 Fortifies the fantasies of FREUD;
 And already cerebral distension,
 Joined to pogo-platypoditude,

⁷³ “Sex Determination,” *Lancet*, June 14, 1924, 1219.

⁷⁴ Julian S. Huxley, “Sex and Its Determination—I,” *Discovery: A Monthly Popular Journal of Knowledge* 3 (1922): 199-202; Julian S. Huxley, “Sex and Its Determination—II,” *Discovery: A Monthly Popular Journal of Knowledge* 3 (1922): 237-41. Julian S. Huxley, *Essays in Popular Science* (London: Chatto & Windus, 1926), 37-55. See also Julian S. Huxley, “Sex at Choice,” *Discovery: A Monthly Popular Journal of Knowledge* 6 (1925): 246-47 and further correspondence in the August edition (312).

⁷⁵ Julian S. Huxley, *Essays of a Biologist* (New York: Alfred A. Knopf, 1923), 133-73.

⁷⁶ Julian S. Huxley, “Human Sex-Determination,” *The Child: A Monthly Journal Devoted to Child Welfare* (April 1922): 206-8; Julian S. Huxley, “Sex Reversal,” *Weekly Westminster Gazette*, September 23, 1922, 6-7; Julian S. Huxley, “Sex-Determination,” *Spectator*, August 2, 1924, 155-56 (see also response by Cicely Erskine in the August 16 edition, 224-25).

Beggars the prophetic invention
Of the Gloomiest Dean's Laputan mood.⁷⁷

Dominating Huxley's approach is his concern that the phenomenon of sex metamorphosis produces a spectrum of intersexed states, the most extreme being a complete reversal of sex that has the apparent effect of skewing the sex ratio. Consistent with his wider biological ideology, Huxley applied his model across species. A particularly striking example of the application of his model of sex reversal to humans is found in the *Eugenics Review* in 1922. In an article titled "A Statistical Method of Testing the Biological Causes Underlying the Excess of Male Births Due to the War" Huxley sought to account for a rise in the number of male births in belligerent nations through the latter years of the Great War. He suggested "that some zygotes which in normal conditions would have been females have been through war-conditions—whether these are nutritional o[r] (more probably) dependent upon nerve strain acting through the sympathetic nervous system on the organism—converted into males".⁷⁸ Supporting the assertion (which he called "the conversion theory") with reference to work on moths and frogs, he proposed a system for its statistical verification.⁷⁹

Huxley continued to pursue his leading research interests through his remaining time at Oxford (he left to assume the chair in zoology at King's College, London in the summer of 1925; his ensuing research programme, and its problems, have been discussed elsewhere by Steindór Erlingsson).⁸⁰ He revisited the biology of sex and, separately, animal courtship intermittently after 1925 both in his academic

⁷⁷ "Millennial Musings," *Punch*, July 5, 1922, 19.

⁷⁸ Julian S. Huxley, "A Statistical Method of Testing the Biological Causes Underlying the Excess of Male Births Due to the War," *Eugenics Review* 13 (1922): 549-50, 549.

⁷⁹ *Ibid.*, 550.

⁸⁰ Erlingsson, "Costs of Being a Restless Intellect."

and his popular and semi-popular writings, but the subjects no longer occupied a central position among his disparate pursuits.⁸¹ He moved on, as Huxley was ever wont to do. The most substantial sexological pieces he wrote after 1925 and before his major contributions to sexual selection theory in 1938 were for his major thirty-one-part collaborative project with H. G. Wells and G. P. Wells, *The Science of Life* (1929-1930), which included a lengthy illustrated chapter titled “What Determines Sex.”⁸² Within a chapter entitled “The Evolution of Behaviour in Vertebrates” that appeared in a separate number, Huxley wrote on the courtship of animals (he also lectured extensively on the subject and continued to publish ornithological studies).⁸³ While the two articles are a useful barometer of how far the biology of sex had come in Britain through the 1920s (a situation largely attributable to Huxley), he never resolved the gulf which separated these different aspects of his studies of the subject; they remained for Huxley separate issues (Figs 6 and 7).

Taken as a whole, Huxley’s publications on the biology of sex form a significant body of sexological writing, the most prolific by a scientific writer in Britain since Havelock Ellis’s major six-volume work *Studies in the Psychology of Sex* (which had, of course, mainly been published in the United States). The differences in Huxley’s approach across platforms is striking; he never promoted his eugenic agenda in academic scientific writing but persistently makes it clear in popular and semi-popular writings that his vision of human biological and social

⁸¹ See, for example, Julian S. Huxley, “The Courtship of Animals,” *Forum* 76 (1926): 57-70; Rose Haig Thomas and Julian S. Huxley, “Sex-Ratio in Pheasant Species-Crosses,” *Journal of Genetics* 18 (1927): 233-46; Julian S. Huxley, “Sexual Difference of Linkage in *Gammarus chevreuxi*,” *Journal of Genetics* 20 (1928): 145-56; Julian S. Huxley and C. J. Bond, “A Case of Gynandromorphic Plumage in a Pheasant Re-examined in the Light of Lillie’s Hypothesis of Hormone Threshold,” *Journal of Genetics* 29 (1934): 51-59.

⁸² H. G. Wells, Julian S. Huxley, and G. P. Wells, “What Determines Sex,” in *The Science of Life*, by H. G. Wells, Julian S. Huxley, and G. P. Wells, 12 (1929-30): 364-78.

⁸³ H. G. Wells, Julian S. Huxley and G. P. Wells, “The Evolution of Behaviour in Vertebrates,” in *The Science of Life*, by H. G. Wells, Julian S. Huxley, and G. P. Wells, 26 (1929-30): 802-32 and 27 (1929-30): 833-47, 819-29.

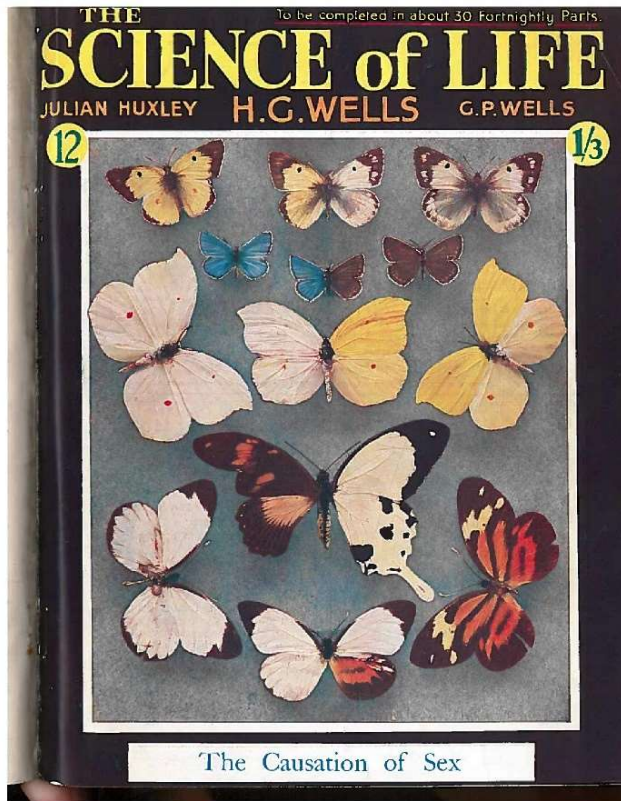
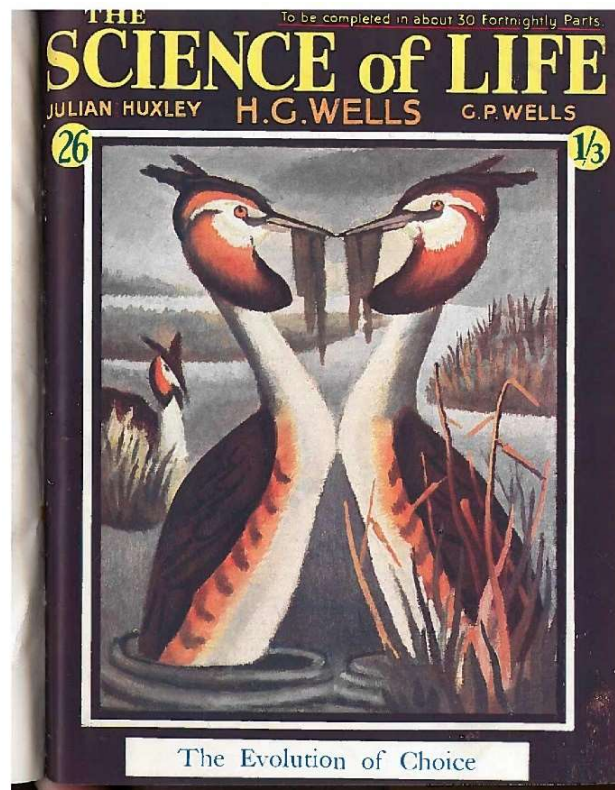


Fig. 6. Illustrating the chapter titled “What Determines Sex,” the cover of issue 12 of *The Science of Life* features a selection of butterflies from the collections of the British Museum (Natural History) in London (today, the Natural History Museum). All the specimens down the centre are intersexed.

Fig. 7. Huxley held great crested grebes as an exemplar of the pinnacle of the evolution of “marriage” in the natural world (his “seraphic symbol” according to Juliette Huxley), an ideal to which he thought human eugenic progress should aspire. This image of the reciprocal courtship rituals of the species on the cover of issue 26 of *The Science of Life* illustrates the chapter entitled “The Evolution of Behaviour in Vertebrates” and was painted especially for the publication by the renowned English artist Gilbert Spencer.



progress is what prompts him and other biologists to pursue the studies which are presented as pure science in publications such as the *Journal of Genetics* and the *British Journal of Experimental Biology*. In this important respect, Huxley's popular writings exemplify the *adaptationist* model of science popularisation that I am introducing in this thesis.

Huxley's importance in establishing the biology of sex as a respectable and well publicised pursuit in Britain through the 1920s cannot be overestimated. It bridges the muted reception of continental sexology and the hegemony of medico-scientific discourses on sexuality, especially so-called sexual "perversions", that were pursued in Britain with increasing gusto from around the early 1930s. Huxley's impact can be gauged in a number of ways. He inspired others to pursue the subject, most notably one of his Oxford students, John R. Baker, whose D.Phil. thesis, *Sex Studies on Mammals*, was published as *Sex in Man and Animals* in 1926 with a preface by Huxley.

Other scientists too, especially F. A. E. Crew (discussed below), emulated Huxley's example by using the media to promote their sex studies and eugenic agendas. Following Huxley's 1922 lecture for the Royal Society of Arts, sexological stories relating to all manner of creatures as well as humans can be found in abundance across the spectrum of popular and semi-popular publications in Britain, especially newspapers. Although models of sexuality derived from psychoanalysis and psychiatry had greater impact in particular settings in twentieth-century Britain (especially the legal and penal sectors), they never achieved the same level of media attention as biological models.

Given his role in establishing the biology of sex as an important object of British academic and media attention, it is puzzling that Huxley's significance in

breaking so much cultural ice has since largely been forgotten. Huxley himself contributed to this situation, making no mention of his early interest in sexology in *Memories*. He had, of course, aligned himself with Richard Goldschmidt, whose model of sexuality had lost public credibility (as Juliette Huxley wrote in her autobiography, not being right was anathema to her husband).⁸⁴ Moreover, his writings on sex were intimately tied up with his eugenics, a subject he largely sidestepped in *Memories*. Still, Huxley's intercession into sexology is historically significant. Particularly during his period at Oxford between 1919 and 1925, he was—for all intent and purposes—Britain's leading interwar sexologist.

F. A. E. Crew and Sex Physiology in Interwar Edinburgh

F. A. E. Crew pursued sexological biology around the same time as Huxley, their approaches having much in common. An examination of Crew's contributions therefore underscores the comprehensive reach of the new biology of sex in interwar Britain. Clare Button has usefully outlined the early history of the Animal Breeding Research Department (ABRD).⁸⁵ Founded in 1919 after almost a decade of negotiation and delay—not least the delay caused by the First World War—the ABRD was one of several government-funded agricultural research centres in Britain

⁸⁴ Juliette Huxley, *Leaves of the Tulip Tree: Autobiography* (London: John Murray, 1986), 166.

⁸⁵ Clare Button, "James Cossar Ewart and the Origins of the Animal Breeding Research Department in Edinburgh, 1895-1920," *Journal of the History of Biology* 51, no. 3 (2018): 445-77. Crew has no personal archive but documents in the archive of the ABRD in the Special Collections section of the Centre for Research Collections, University of Edinburgh Library, provide useful insights into the ABRD's research programme on sex physiology (which does not form part of Button's study). Among these are an unpublished autobiographical memoir ("Francis Albert Eley Crew", EUA IN1/ACU/A2/4/2) and an unpublished account of the early development of the ABRD titled "Institute of Animal Genetics at Edinburgh: The First Twenty Years", undated but written around 1971, by Margaret Deacon (EUA IN1/ACU/A1/4/1).

that were established following the early development of genetics. The ABRD was exceptional among these centres for focusing exclusively on animal breeding. Despite its tardy origins, the Department enjoyed considerable success, attracting supplementary private funding and garnering an international reputation for biological research.

Much of this success can be attributed to the talents and charismatic personality of F. A. E. Crew who was the ABRD's first director. Prior to being offered the prestigious position as Director of the new ABRD, Crew worked as an assistant in the University of Edinburgh's Natural History Department. A trained physician who had served in the Royal Army Medical Corps during the Great War, he spurned a medical career having been exposed to the new genetics during his training (at Edinburgh) by some of Britain's leading biologists including Arthur Dukinfield Darbishire, F. H. A. Marshall, and Edward Albert Sharpey-Schafer. The new biology appealed to Crew whose boyhood hobby of breeding bantams had won him prizes at local shows. In common with Huxley, he was also a dedicated "reform" eugenicist; his first article, published in October 1919, was for the *Eugenics Review* and related how his intellectual outlook had changed because of his experience of war service. He repudiated a dogmatic biological essentialism which he associated with Germany but which he thought also blighted British cultural life. He called for "a new social inheritance" upon which "a new Britain" could be built and urged his fellow eugenicists to take up the call; if the call came from the church, he argued, it would be ignored.⁸⁶

From its outset, Crew determined that the research activities of the ABRD should incorporate both economically motivated research aimed at the artificial

⁸⁶ F. A. E. Crew, "A Biologist in a New Environment," *Eugenics Review* 11, no. 3 (1919): 119-23, 122.

improvement of livestock, and pure research related to the new genetics. The biology of sex determination, sex development, and other sex-related scientific problems formed a sizeable and important component of the ABRD's research programme from its outset. Whether the "Sex Physiology" section, as it was known, was primarily pursued as a matter of practical import for animal breeders, or for its pertinence to Mendelism and the new genetics, is difficult to ascertain; questions relating to sex determination and its control spanned a raft of interests, making them an ideal focus for the new Department.

The sex biology section was privately funded by several individuals, most notably Thomas Bassett Macaulay, a wealthy Canadian philanthropist with Scottish ancestry, who financed the ABRD's sex biology until 1932 when the investments that funded the research nosedived in value because of the Depression, causing Crew to reluctantly wind down the ABRD's sex-related research altogether. At its height, however, the Sex Physiology section dominated the activities of the ABRD, accounting for more costs than the rest of the Department put together and employing around twenty people just prior to the collapse in financial fortunes. So too did the study of sex biology form an important part of the ABRD's reputation as an international centre of genetic research. Among many notable entries in its Visitors' Book (containing entries from June 1924 to May 1947), the eminent American biologist Oscar Riddle, whose entry is dated November 11, 1926 and includes a photograph, commended the Department, remarking: "[t]o its splendid contributions to Sex Research I pay special homage."⁸⁷

A special address, delivered on the occasion of the opening of a new building on June 30, 1930, divided the activities of the ABRD into four main categories (as

⁸⁷ ABRD Visitor's Book, EUA IN1/ACU/A1/3/3. Archive of the ABRD, Special Collections, Centre for Research Collections, University of Edinburgh Library.

well as a fifth category for miscellaneous activities and a sixth for teaching): formal genetics, physiological genetics, sex biology, and animal husbandry. Crew summarised the work on sex biology as “the experimental analysis of sex and the isolation and refinement of those physiological agencies elaborated by the body which affect the sexual and reproductive life of the individual.”⁸⁸ Biologists in the ABRD also taught a short course on the physiology of sex and reproduction in the Physiology Department of the University.

Crew’s studies on the differentiation of sex, intersexuality, and sex reversal were the mainstay of the ABRD’s sex-related studies. In common with Huxley, Crew was initially persuaded by Richard Goldschmidt’s highly theoretical “balance theory” of sex development, an influence that shaped not only Crew’s sex-related studies but also those of others who worked with him and, also in common with Huxley, the way in which the ABRD’s sex biology was reported across diverse medical and scientific genres of publishing as well as in Britain’s newspapers and other periodicals. In his 1974 obituary of Crew for the *Biographical Memoirs of Fellows of the Royal Society*, Lancelot Hogben, who briefly worked as Crew’s deputy at the ABRD, stated that, in his opinion, Crew’s work on intersexuality through the early 1920s was “foremost among his contributions.”⁸⁹ In an insightful memoir written in 1969 (for an audience of fellow biologists), Crew reflected on his early acceptance of Goldschmidt’s theory, long outmoded by 1969: “Though unsatisfactory in many ways,” he wrote, “this, to me, was an introduction to epigenetics and I found it very attractive for the notion of a turning-point in the

⁸⁸ Department of Animal Genetics, University of Edinburgh, *Programme of the Formal Opening of the New Building and Special Graduation Ceremonial Monday, 30th June 1930*, 14. EUA IN1/ACU/A1/4. Archive of the ABRD, Special Collections, Centre for Research Collections, University of Edinburgh Library.

⁸⁹ Hogben, “Francis Albert Eley Crew,” 138.



Fig. 8. F. A. E. Crew (right) photographed with Richard Goldschmidt (left), Edinburgh, 1923 (reproduced from Richmond, “The Cell as the Basis for Heredity,” 192)

development of the condition of intersexuality, though never subject to strict proof, was very useful in those days before chromosome aberrations could be thoroughly studied.⁹⁰

Goldschmidt’s influence on Crew is clear from some of Crew’s earliest published biological studies, which concerned abnormalities in the reproductive physiology of frogs and toads (work which earned him his doctorate). Notably, one of these studies relates that Huxley had embarked on a study of specimens that he handed over to Crew having learned that Crew was pursuing his own study. The association with Huxley is particularly significant since Crew aligned his analysis

⁹⁰ Crew, “Recollections,” 14. In his unpublished biographical memoir, Crew wrote of his studies on intersexuality and sex reversal: “My work on this subject was carried out long before the newer techniques of cytology had made it possible profitably to examine the karyotype and had disclosed the relationship between particular aberrations in the distribution of the chromosomal material and particular abnormalities of the sexual phenotype. For this reason the conclusions I reached and the explanations I offered have mostly become outmoded. However, in their time they were, I think, both plausible and helpful.” Crew, “Francis Albert Eley Crew.”

with that of Huxley, helping to establish a remarkably coherent scientific outlook of sex development based on Goldschmidt's theory of intersexes, but promulgated by British biologists on a broad scientific and cultural canvass through the 1920s and into the 30s.

Crew described how the abnormalities of his specimens ranged in gradation from one which was "almost completely female" to one "almost completely male", both with regard to primary and secondary sexual characteristics as well as reproductive capabilities. Crew believed, à la Goldschmidt, that, taken together, the specimens represented an almost complete series of gradations, "and that the conditions found readily appear to be merely graded stages of a single process."⁹¹ This singular process Crew considered to be the transformation of a genetic female into a fully functioning male. At the time Crew was writing (1920-21), the existence of sex chromosomes had not been demonstrated in frogs, although Huxley had asserted (in his article on millions fish) that they were likely to be of the ♀XX, ♂XY type. "This being the case," Crew wrote, "then these individuals, XX in composition, instead of developing into normal females, became transformed into "somatic" males by the action of some factor or combination of factors which over-rides the chromosome constitution." He continued: "They have the chromosome constitution of the female sex, but the actual organisation of the male. The mating of such individuals, functioning as males, must disturb the sex-ratio of the next generation, and this fact may explain the unusual sex ratios recorded by many authorities."⁹² In

⁹¹ F. A. E. Crew, "Sex-Reversal in Frogs and Toads. A Review of the Recorded Cases of Abnormality of the Reproductive System and an Account of a Breeding Experiment," *Journal of Genetics* 11 (1921): 141-81, 141.

⁹² F. A. E. Crew, "A Description of Certain Abnormalities of the Reproductive System Found in Frogs, and a Suggestion as to Their Possible Significance," *Proceedings of the Royal Physical Society of Edinburgh* 20 (1915-1923): 241-58, 256.

this way, Crew aligned his study of frogs with Huxley's study of millions fish, both biologists persuaded by Goldschmidt's balance theory of sex development.

Following on from his studies of frogs and toads, Crew produced a raft of studies on developmental intersexuality in fowl and mammals. These appeared in a range of British and American medical and scientific publications including the *British Medical Journal*, the *Journal of Genetics*, the *Journal of Heredity*, the *Journal of Obstetrics and Gynaecology*, *Nature*, *Proceedings of the Royal Society of London (Series B: Biological Sciences)*, the *Quarterly Review of Biology*, the *Veterinary Journal*, and specialist agricultural periodicals.⁹³ Crew's first major book, *Animal Genetics: An Introduction to the Science of Animal Breeding* (1925) contains chapters on the mechanism of sex determination, the physiology of sex differentiation, and the sex ratio and the question of its control.⁹⁴

In common with other biologists who were engaged in the rapidly developing field of agricultural science, Crew's scientific network necessarily encompassed a broad range of biologists, farmers, breeders, and journalists. His primary interest in anomalies of sex development was therefore disseminated and echoed widely, as Crew worked hard to acquire the animals he required for his research, and to promote his studies of them across scholarly and popular publications. An early example of this purposeful outreach can be found in the edition of *Poultry World* dated August 26, 1921. A banner on the front cover declares "Poultry Research at Edinburgh. Breeders' Co-operation Invited." An article on Crew's research inside the issue is titled "Dr. Crew and His Work. Avian Research at the University of Edinburgh. Poultry Keepers Invited to Help by the Sending of Subjects and Describing

⁹³ Bibliographies of Crew's published works, and those of other biologists at the ABRD, can be found in the Director's annual reports. See also Hogben, "Francis Albert Eley Crew," 145-53.

⁹⁴ F. A. E. Crew, *Animal Genetics: An Introduction to the Science of Animal Breeding* (Edinburgh: Oliver and Boyd, 1925).

Abnormal Occurrences.” The piece, accompanied by a picture of Crew holding a hen with male-typical feathering, makes a passionate plea for cooperation between scientists such as Crew and poultry breeders, stating that “[Crew] wishes to learn from the practical breeder and is also desirous to learn in such a manner that breeders may learn from him.”⁹⁵

In fact, Crew’s sex-related studies at the ABRD brought him considerable fame as one of Britain’s leading biologists. His emergence, alongside Huxley, as an authority on the new biology of sex in Britain’s newspapers was occasioned by a meeting of the Zoological Section of the British Association in Edinburgh early in September 1921, at which Crew delivered a lecture on his experiments on sex reversal in frogs, toads, and fowl. Evidently happy with the stories that the paper had been running relating to Huxley’s sex-related studies earlier that year, it was again the *Daily Mail* (September 9) that led the pack, a headline declaiming “Sex Changed by Science: Female Frog Turned into a Father: Wonder Serum: Hen That Grew Cock’s Plumage.” The article describes Crew’s “hair-raising experiment” whereby he had “completely” changed a female frog into a male, proclaiming that “[s]o astonishing a theory of transformation was never seen or dreamt of, or the old subject of the determination of sex never more strangely illustrated.” Having further outlined examples of avian sex transformation, the piece concluded: “Female qualities exist in the male and male qualities in the female, but are latent, and can in certain cases be brought out as well as proved to exist by a study of the offspring.”⁹⁶

⁹⁵ “Poultry Research at Edinburgh: Breeders’ Co-operation Invited.” An article on Crew’s research inside the issue is titled “Dr. Crew and His Work. Avian Research at the University of Edinburgh. Poultry Keepers Invited to Help by the Sending of Subjects and Describing Abnormal Occurrences,” *Poultry World*, August 26, 1921, 448.

⁹⁶ “Sex Changed by Science: Female Frog Turned into a Father: Wonder Serum: Hen That Grew Cock’s Plumage,” *Daily Mail*, September 9, 1921, 7.

Local newspapers echoed the article; for example, the story ran in the *Nottingham Evening Post* (September 9) under the headline “Weird Sex Science: Frog Turned from Mother to Father: Amazing Transformation Theory” (Fig. 1).⁹⁷ An intrepid correspondent from the *Sunday Express* followed up the story by visiting Crew at the ABRD and reporting about their visit in the edition dated September 11 under the headline “Hens Changing to Roosters: Many Wonders of a Biological Farmyard: Science and Sex.”⁹⁸ The piece is notable for spotlighting the sexual preferences of Crew’s sex-transformative birds, beginning: “Hens that crow and flirt with other hens, and hens that have spurs and combs and strut and ‘swank’ like cockerels are among the wonders of the most wonderful collection of fowls in the world” (Crew’s appraisals of homosexuality are discussed in the following chapter of this thesis). Again, the article reverberated in local newspapers. The *Dundee Courier* (September 12), for example, heralded “Hens That Change Their Sex: World’s Most Wonderful Collection of Fowls: An Edinburgh Doctor’s Experiments” while the *Aberdeen Press and Journal* (September 13) ran with “Wonderful Fowls: Hens that Change Their Sex: Remarkable Experiments.”⁹⁹

Other sexological media events were prompted by Crew’s appearances at scientific and agricultural events. Further lectures on his sexological studies at meetings of the British Association in September 1922 (at which he chiefly discussed intersexuality in goats) and in September 1923 (where he focussed on sex changes in fowl), and a lecture to the Royal Institution in May 1924, to name a few, all

⁹⁷ “Weird Sex Science: Frog Turned from Mother to Father: Amazing Transformation Theory,” *Nottingham Evening Post*, September 9, 1921, 1.

⁹⁸ “Hens Changing to Roosters: Many Wonders of a Biological Farmyard: Science and Sex,” *Sunday Express*, September 11, 1921, 7.

⁹⁹ “Hens That Change Their Sex: World’s Most Wonderful Collection of Fowls: An Edinburgh Doctor’s Experiments,” *Dundee Courier*, September 12, 1921, 1; “Wonderful Fowls: Hens that Change Their Sex: Remarkable Experiments,” *Aberdeen Press and Journal*, September 13, 1921, 2.

occasioned new rounds of sexological reporting.¹⁰⁰ Occasional articles can be found well into the 1930s but the early enthusiasm for sex-transformative animals diminished through the later 1920s. Goldschmidt's theory fell out of favour and, as David Andrew Griffiths, Alison Oram, and Clare R. Tebbutt have shown, professional and popular interest shifted decisively towards medico-scientific approaches to "sex change"/"gender crossing" in humans. Still, popular books about the biology of sex readily took up the challenge of explaining the increasingly complex genetics and endocrinology of sex development to an eager reading public in Britain, which remained fascinated by the subject and apparently hopeful that methods of sex control would soon be mastered.

In this endeavour Crew remained at the forefront. Indeed, all of Crew's books on the biology of sex were written for a popular readership, including *The Genetics of Sexuality in Animals* (1927) and *An Introduction to the Study of Sex* (1932). His most enduring book was *Sex-determination*, a short overview of the subject published as part of Methuen's Monographs on Biological Subjects series, initially in 1932 with further editions following in 1946, 1954, and 1965. In a similarly popularising spirit, Crew wrote the article "Sex" for the fourteenth edition of the *Encyclopædia Britannica* (1929) and a similarly-titled article for the single-

¹⁰⁰ See, for example, "Goats Change of Sex: Female Which Became Male," *Daily Mail*, September 13, 1922, 10; "New Riddle of Sex Solved: Goats Changed from Females to Males: Science Dreams: Will Mankind React to the Same Agencies?," *Daily Express*, September 13, 1922, 5; "The Hen-Cock: Chicks of Birds That Changed Sex," *Daily Mail*, September 4, 1923, 5; "Reversed Sex in Hens: Substitution of Male Tissue," *The Times*, September 19, 1923, 15; "Female Fathers: Birds and Insects That Change Sex," *Daily Mail*, May 12, 1924, 4. There are dozens of other, comparable national and local newspaper articles, too many to list. Importantly, they are not restricted to the activities of Crew and Huxley. Others, for example, report the sexological doings of William Bateson, Oscar Riddle, Edward Bagnall Poulton, and others. See, for example, "Sex Change," *The Times*, May 11, 1921, 9; "Sex-Determination: Control Possible in Some Animals," *The Times*, May 14, 1921, 7; "Boy or Girl at Will: Doctor's Theory of Sex Determination," *Daily Mail*, May 27, 1922, 7; "Changing Sex: U.S. Scientist on Future Possibilities," *Daily Mail*, December 29, 1923, 8; "Changing the Sex: Caterpillar Tests: Entomologist's Experiments," *Daily Telegraph*, March 10, 1927, 10.

volume encyclopaedia *An Outline of Modern Knowledge* (1931).¹⁰¹ In common with Huxley, Crew also gave public lectures on the biology of sex and spoke on the subject on the radio (for example, a broadcast lecture at the invitation of the BBC, entitled “Sex: How and When It is Determined” on May 21, 1926).¹⁰² This genre of sexological reporting was widespread in Britain through the 1920s but remained tightly focussed on experimental studies of sex transformation. Where a bigger picture was sought it was confined to the question of sex determination and whether the supposedly complete transformations of sex asserted by Crew and Huxley could be purposefully applied to humans and thereby derive a means of controlling the human sex ratio.

¹⁰¹ F. A. E. Crew, *Encyclopædia Britannica*, 14th ed. (1931), s.v. “sex”; F. A. E. Crew, “Sex,” in *An Outline of Modern Knowledge*, ed. William Rose (London: Victor Gollancz, 1931), 253-303.

¹⁰² F. A. E. Crew, *Animal Breeding Research Department, The University, Edinburgh: Report of the Director for the Year 1st April 1926 to March 31st 1927 (being the 7th Annual Report.)* (Edinburgh, 1927), 33.

4. “Popular” Biologies of Homosexuality in Interwar Britain

This chapter focuses on concepts of “homosexuality” derived from the biological sciences, primarily endocrinology and genetics, as same-sex sexual desires and behaviours emerged as a flashpoint of popular and intellectual debate in Britain like never before, from the early 1920s and proliferating thereafter. The previous chapters of this thesis charted and analysed how the emergent, interlinked sciences of genetics and endocrinology produced new ways of conceptualising sex differences and, where discussed, sexualities and sexual behaviour that rapidly gained in explanatory power through the early decades of the twentieth century in Britain and elsewhere.

Biologists paid much attention to “sex reversal” (especially, in Britain, in relation to birds), notions of which were poorly defined and were, at least in humans, largely rendered obsolete by several new clinical diagnoses such as those investigated by Lennox Broster that were subsequently understood separately, at least by physicians.

“Sex reversal” had, with varying degrees of success, also accommodated notions of “sexual inversion,” which held same-sex sexual desires and behaviours to be indicative of a hidden biological and/or psychological intersexuality. As scientists and physicians delineated more specialist modes of understanding sex variations (still often in pathologised conceptions and rhetoric), the term “sexual inversion” was largely sidelined, at least in medico-scientific circles, although continued uses of the term can be found into the postwar era. In its place, “homosexuality”—coined (in German) in 1869 but little used in Britain beyond specialist sexological texts until the 1920s—became the standard term to refer to (mainly male) same-sex desires and behaviours. The terms lesbian and lesbianism, and sometimes sapphism, had a much

longer linguistic history than homosexuality but were similarly used in medico-scientific contexts during the interwar era and beyond.

Notwithstanding a general transition from “sexual inversion” to “homosexuality” through the interwar period, boundaries between terms and concepts relating to sexualities and sexual behaviours remained highly porous and often highly confused. As well as dwindling usage of “sexual inversion” and a concomitant rise in the usage of “homosexuality” (often these terms being used interchangeably), other, judgement-laden terms were used in medico-scientific contexts to denote same-sex sexual desires and behaviours. They include “sexual perversion,” “third sex,” “disgusting and opprobrious vice,” “inverts,” “unnatural crime,” and “evil” (all these terms are quoted and referenced below).

Despite the porousness of such terms and categories, sexological concepts and rhetoric assumed expanding intellectual and cultural currency at all levels of British society, increasingly so from the early 1920s as public and scholarly debates about the nature and aetiology of homosexuality and its status in law and society were pursued on an unprecedented scale. The role of medico-scientific concepts in the broader socio-political and legal debates about homosexuality through the era have previously been noted by certain historians, although their studies have focussed almost exclusively on the burgeoning influence of psychiatry and psychoanalysis in bringing about an intensified medicalisation of sexualities, especially homosexuality, through the period.

For example, Jeffrey Weeks has suggested that “the medical model of sexual aberrancy” became articulate, but not dominant, during the interwar period. He considers that “the influence of Havelock Ellis and Sigmund Freud began to infiltrate the writings of the relevant organisations and individuals” but also considers the

influence of the early development of psychological treatment for crime which manifested as a concerted effort to integrate the assertions of psychoanalysis within a broader psychological approach towards “delinquency.”¹ Janet Weston has subsequently made a comprehensive study of the developing discipline of criminal psychiatry which steadily gained institutional support in Britain through the first half of the twentieth century and the concomitant emergence of the “sexual offender” as a diagnostic category.² The pioneering efforts of criminal psychiatrists, especially William Norwood East, culminated in a major Home Office report published in 1939, entitled *Report on the Psychological Treatment of Crime*.

These shifts in the conceptualising of same-sex sexual desires and behaviours were set in motion in the interwar period, as modernist medico-scientific precepts began to be absorbed and perpetuated in multiple intellectual and popular contexts. They are necessarily complex, and require continual unpacking by historians. The concept of a homogenous “medical model” of homosexuality, referred to by Weeks, is no longer tenable. Elsewhere I have explored how medically-oriented terms, including “homosexual/ity” and “perversion,” impacted on Oxford’s undergraduate community, displacing older notions such as “aesthete” and “romanticism” that had long been used to designate the queer lives and loves of Oxford’s male students.³ This development began in the late-1920s and was largely complete by 1940.

Continuous with the examination of their broader sexological outlooks in the previous chapter of this thesis, the first and second sections of the present chapter focus closely on F. A. E. Crew’s and Julian Huxley’s perspectives on homosexuality.

¹ Jeffrey Weeks, *Sex, Politics and Society: The Regulation of Sexuality since 1800*, 4th ed. (Abingdon: Routledge, 2018), 239.

² Weston, *Medicine, the Penal System and Sexual Crimes*.

³ Ross Brooks, “Beyond Brideshead: The Male Homoerotics of 1930s Oxford,” *Journal of British Studies* 59, no. 4 (2020): 821-56.

Even though they did not write much on the subject, their published remarks are a useful barometer for changing concepts and rhetoric and signal the emergence of new, endocrinological modes of conceptualising homosexuality which permeated both intellectual and popular discourse through the interwar era. Huxley's views, examined in the first section, were influential in prompting revitalised calls for reform of the law relating to sex acts between males. The section charts a significant correspondence which appeared in the *British Medical Journal* in the spring of 1922 after the English physician Leonard Williams, following Huxley's lead, made an audacious call for law reform founded squarely on the notion that homosexuality was biologically determined.

For his part, Crew's statements on homosexuality, examined in the second section, evidence changing attitudes towards Eugen Steinach's hugely influential experiments on sex and endocrinology. The section also looks at the early sexological works of the English urologic surgeon Kenneth Walker, another exponent of the hormonal model of homosexuality and with whom Crew collaborated on the first known surgical castration of a gay man in modern Britain, described here in scholarship for the first time, which was performed with the express intent of reducing or eliminating the man's homosexuality.

Alongside endocrinological models of homosexuality, the notion that same-sex eroticism could be heritable increasingly featured as another prominent trope in the "homosexuality" debates that emerged in Britain as a flashpoint of popular and intellectual debate through the interwar era and beyond. The third section of the chapter charts how such notions and interpretations of the heredity of homosexuality took shape during the interwar period and into the postwar era. The section shows that, for the most part—and notwithstanding lingering references to heredity in the

works of major late-nineteenth- and early-twentieth-century sexologists such as Richard von Krafft-Ebing—British biologists, eugenicists, and their interlocutors did not tend to concern themselves with the subject of homosexuality when considering genetics. Notions of the heredity of homosexuality were chiefly disseminated in Britain in popular and semi-popular texts emanating from two other countries: Germany and the United States. Tensions between assertions of the naturalness of homosexuality made on the basis of heredity and contrary assertions of pathology, were particularly acute in interwar Germany. Magnus Hirschfeld and his followers, especially the Dutch sexologist Lucien von Römer, argued fervently that inheritance patterns suggested that homosexuality ran in families. Nazi geneticists adopted an alternative, pathological interpretation of the same basic notion. In particular, the German psychiatrist Theo Lang, whose studies on homosexuality were reported in Britain, sought to resuscitate Richard Goldschmidt's theory of homosexuality as a case of genetic intersexuality (which Goldschmidt himself abandoned in 1931) by recourse to extensive studies of sibships. The section, and the main chapters of this thesis, concludes by looking at the enormously popular books on heredity (published in the United States and Britain) written by the prominent American science writer and eugenicist Amram Scheinfeld, which contain some of the most substantial and, for the era, progressive assessments of the genetics of homosexuality of the mid-twentieth century.

Endocrine Homosexuality I: Julian Huxley and Leonard Williams

Neither F. A. E. Crew nor Julian Huxley wrote much about same-sex sexual behaviours even though the subject was deeply implicated in Richard Goldschmidt's theory of intersexuality, which both Crew and Huxley promulgated. As considered in the previous chapter, Huxley, following Goldschmidt, accepted homosexuality as the slightest form of intersexual gradations which existed in humans—a position he discussed in the pages of *Discovery* and elsewhere. In his address to the Royal Society of Arts in January 1922, Huxley made some pointed remarks on the subject that are especially noteworthy for the reactions they prompted. Reflecting his commitment to Goldschmidt's theory of intersexuality, Huxley's remarks on same-sex sexual behaviours in humans blended with his analysis of “partial sex-reversal” in humans (“man”).⁴

“New light is thrown upon this dark medico-legal subject by the biological conception of intersexuality”, he declared, going on to state:

It is important to note that a complete transition exists in man from very slight degrees of intersexuality, where only the sexual instincts seem to be affected (and here it is interesting to find that most modern authorities hold that most cases of sexual perversion are due to inherited causes) through advancing degrees of so-called pseudo-hermaphroditism, in which various stages of physical intersexuality occur, to complete hermaphrodites. This complete transition is paralleled by the transition in Goldschmidt's moths.⁵

There were, Huxley believed, several implications of such an approach to “human sexual abnormality.”⁶ The first was therapeutic: “there is a distinct theoretical possibility that cases of sexual perversion might be cured by injection or grafting of the proper reproductive organ. Goldschmidt has already drawn attention to this, and I

⁴ Huxley, “Some Recent Advances,” 214.

⁵ Ibid.

⁶ Ibid.

believe that the suggestion is being tested in Germany.”⁷ He further indicated that there were legal implications relating to the recognition of sex identity, arguing that “it is highly probable that human intersexes are neither male nor female, but definitely intermediate in sex. If so, then it must be wrong to assign a normal sex to them legally, for they belong to a third category, and if this category is biologically a real one, as is certainly the intersexual category in moths, then the law should recognize it.”⁸ Finally, he outlined ethical implications, squaring up to the prevailing cultural attitude of treating “departures from sexual normality” with legal penalties and moral censure. “If,” he wrote, “as seems highly probable, many of the individuals who thus depart from the normal are not morally perverted, but simply in the grip of blind hereditary forces, of whose results alone they are aware, then it is clear that a new standard is needed with which to measure the whole matter.”⁹

While such arguments for wholesale change in legal and cultural attitudes towards sexual variants had previously been made in Britain by Havelock Ellis and other freethinking sex radicals, such explicit and public advocacy by an Oxford biologist was unprecedented. A frisson of tension among his audience is perhaps suggested by remarks from the chairman of the meeting, Peter Chalmers Mitchell, intended to cool the atmosphere. Huxley’s radicalism apparently exceeded the limits of Mitchell’s, discussed in the first chapter of this thesis. Having commended Huxley and his lecture and mulled over some of the points that had been raised, Mitchell moved to quell Huxley’s advocacy, concluding his reflections with the following:

All those who had heard Mr. Huxley’s paper that evening must be greatly indebted to him for it, but personally he hoped people would not go away with the idea that an entirely new line of discovery had been opened up and that the world was going to be transformed, the criminal law amended and

⁷ Ibid.

⁸ Ibid., 214-15.

⁹ Ibid., 215.

many other things happen simply because some flies had red and some had white eyes, and because they behaved curiously in bottles in American laboratories.¹⁰

Mitchell's intervention aside, Huxley's extraordinary advocacy was echoed elsewhere. Apart from the whole paper, and an account of the discussion that followed it, appearing in the *Journal of the Royal Society of Arts*, the *British Medical Journal* (January 28, 1922) published a precis, including Huxley's assertion that "[i]f human sexual abnormality were considered in the light of recent work on animals, there seemed to be a distinct theoretical possibility that cases of sexual perversion might be cured by injection or grafting of the proper reproductive organ, a procedure which was being tested in Germany."¹¹ The piece also reported Mitchell's hope that "the audience would not go away with the idea that because certain discoveries had been made regarding moths, the world would be revolutionized or even that the criminal law would be amended."¹²

Something like Huxley's innovative amalgam of sex, science, and eugenics appeared in a later edition of the *British Medical Journal*. Following Huxley, Leonard Williams, a London physician with a leading interest in endocrinology, made an equally audacious call for law reform in front of the Westminster Division of the British Medical Association, subsequently published in the *British Medical Journal* on May 27, 1922. The piece, and the responses it provoked, are significant, being explicitly and inextricably tied up with prevailing issues of women's emancipation and the legal status of homosexual acts.

Williams's chief concern was with the interstitial gland, a mysterious entity in 1922. As was common for an era which still maintained multiple theories of sex

¹⁰ Ibid., 218.

¹¹ "The Determination of Sex," 158.

¹² Ibid.

determination, Williams pondered at length on what role his chosen gland might play in the production of maleness and femaleness. His fanciful (and somewhat melodramatic) description of the processes involved held that sex resulted from an endocrinological battle of the sexes as “warring elements”, female and male cells within the incipient embryo, vied for supremacy.¹³ Each of these elements were charged with the sexualising potential of their respective sexes. The initial battle between the two was invisible, occurring within an embryo that was essentially neuter in its original formation. Sexual characteristics become manifest as the battle plays out in favour of either male or female (Williams generally envisaged male as victorious), although, “the victory is never complete.”¹⁴ He continued: “The embryonic interstitial glands on both sides have been mobilized, the armies have been engaged, and albeit the one may win, the other, though defeated, is by no means annihilated.”¹⁵ The sexual antagonisms (and, unfortunately, the military analogy) continue apace, through “a second battle royal” at puberty.¹⁶ At this time some female secondary sexual characteristics—broad pelvis, high-pitched voice, “female mentality” and “feminine tastes”—may well become apparent.¹⁷ He wrote: “There is no man but has some taint of the woman in him, and no woman without some smatch of the male.”¹⁸ Williams’s argument for law reform was therefore founded on a diehard case of biological determinism:

[...] I am entirely of the opinion, suggested rather than expressed in a recent lecture by my friend Julian Huxley—namely, that the present law on the subject requires revision. Regarded in the light of pure physiology, it is no more reasonable to punish a man for being homosexual than it would be to punish him for having red hair. Both of

¹³ Leonard Williams, “The Interstitial Gland,” *British Medical Journal*, May 27, 1922, 833-35, 833.

¹⁴ *Ibid.*

¹⁵ *Ibid.*

¹⁶ *Ibid.*

¹⁷ *Ibid.*

¹⁸ *Ibid.*

these things are burdens cast upon him by forces over which he has no sort of control, nor can he alter or even modify them by any effort of the will. It is high time that the members of our profession expressed strong and clear views on this question. Let us remember that it is not so very long ago that people were tortured for being insane, and that it was a great-hearted French physician, Philippe Pinel, who died in 1826, who, at the risk of his own life and liberty, insisted upon the humane reforms which were afterwards generally adopted.¹⁹

Echoing Huxley, and the eugenic mentality of the age, Williams's "light of pure physiology" immediately cast a dark shadow. Pondering the question of the "artificial determination of sex", he asserted that if his theory were correct then it should be possible to manipulate the hormonal balance in the uterine environment in order to prevent homosexuality; in Williams's words: "by reinforcing the male element in the embryo by male interstitial gland, administered to the mother, we ought to be able to determine the victory in favour of definite maleness in the full-time child, and that by exhibiting the same extract when puberty threatens we could ensure against anything in the nature of homosexuality in the adult."²⁰

Williams's piece elicited a couple of responses in the correspondence pages of the *British Medical Journal* (June 17), both evidently prompted by his brazen discussion of homosexuality that had formed only a small part of his article. R. Douglas Howat began his letter: "If his suppositions are correct, and it is possible for a male child to grow up morphologically male but "interstitially" largely female, then, as he suggests, homosexuality in such an individual ceases to be a felony, and must be regarded as normal *per se*. But if this latter suggestion comes to be accepted, we may look for some striking defences in cases of unnatural crime." Howat proceeded to challenge Williams about the facts of sex determination and whether the embryo was genuinely neuter for the first few weeks of life. He thought Ernest

¹⁹ Ibid.

²⁰ Ibid.

Rumley Dawson's theory (referred to in the first chapter of this thesis), that sex was fixed in the ova, males originating in the right ovary, females in the left, was more likely. Still, the eugenic imperative pervaded and Howat concluded his letter: "If we are to accept Rumley Dawson's sex theory at all—and, so far as I have been able to ascertain, no later investigations have actually disproved it—then, instead of administering male interstitial gland, as Dr. Williams suggests, in cases of deficient "maleness," one would require to administer corpus luteum extracted from the right or male ovary, and from the left or female ovary in cases of deficiency in "femaleness."²¹

A second respondent, Surgeon Rear-Admiral C. Marsh Beadnell, took great exception to Williams's suggestion that the law relating to male homosexual acts required revision. Drawing a distinction between homosexuality as an innate "state or condition" and the "disgusting and opprobrious vice" of homosexual acts, Marsh Beadnell compared the scenario of legalising such acts to a person being allowed to walk naked in the street when hot or urinating in public. Recourse to physiology, he argued, was no way to frame the law:

To be consistent, Dr. Williams will have to admit that individuals addicted to lesbianism, tribadism, sapphism, masochism, and all other "beastly isms" of the sexual pervert no more merit punishment than do the possessors of red hair! Fortunately, however, society has not so evolved and framed its laws of conduct. While making all due provision for physiological and, it should be added, pathological factors, it recognizes these only in conjunction with many other equally important factors, and it insists that such eccentrics should be clapped either into prison or madhouse. It does so with three objects: to cure the individual of his anti-social proclivities, to deter others from like conduct, and to rid itself of that which is a source of annoyance and disgust.

²¹ R. Douglas Howat, "The Interstitial Gland and Sex Problems," *British Medical Journal*, June 17, 1922, 973. Italics in original text.

Believing that most homosexual acts were committed by persons who had acquired the habit by “faulty nurture, not faulty nature”, Marsh Beadnell firmly believed that legalising such acts would only increase their occurrence. He ended his letter: “A lenient attitude towards perpetrators of homosexual acts constitutes a grave social danger.”²²

Williams penned a response to his critics, the final correspondence on the matter, which was published in the *British Medical Journal* in its edition dated June 24. He reiterated his position that an admixture of female and male interstitial elements in the hormonal make-up of certain individuals constituted a biological homosexuality, this time referring to such individuals as a “third sex”.²³ He again argued fervently that the sexual desires of such individuals were neither vicious nor diseased (“it is no longer scientifically sound to regard it as altogether pathological”), but again suggested that the biological variables could potentially be subjected to eugenic control (“it seems reasonable to hope that attention to these glands, given in time, may save people from this rather sinister indeterminate state”).²⁴

Together, the correspondence has a decidedly modern ring, resonating with “for” and “against” arguments that have now long characterised debates about the status of homosexual acts, and LGBTQ+ people, in British law. This is, however, the first time such a discourse appeared in the British medical press. Earlier calls for reform on medical grounds had long been made by Havelock Ellis and his interlocutors such as Solomon Herbert and certain members of the BSSSP. Such public calls, however, were largely ignored by the medical establishment and

²² C. Marsh Beadnell, “The Interstitial Gland and Sex Problems,” *British Medical Journal*, June 17, 1922, 973.

²³ Leonard Williams, “The Interstitial Gland and Sex Problems,” *British Medical Journal*, June 24, 1922, 1009-10, 1009.

²⁴ *Ibid.*, 1010.

remained incontrovertibly one-sided conversations. It was only following Huxley's youthful but nonetheless authoritative intercession that a new, modernist style of homosexual advocacy, and its combative counterpart, co-emerged from within the medico-scientific professions. Invariably the advocates of reform were physicians who were not themselves known as homosexuals and who argued the case for reform on medical grounds. In this significant development in the ways that sexualities were debated in mid-twentieth-century Britain, correspondence pages in newspapers, professional journals (such as the *British Medical Journal* and the *Lancet*), and the major thinking journals aimed at an educated readership (such as the *New Statesman and Nation* and the *Spectator*) played hugely important roles and are deserving of greater attention in scholarship than they have hitherto generally received.

Huxley continued to forward his biological vision of homosexuality in his published writings, albeit only occasionally and somewhat obliquely. For example, in his essay on "Sex Biology and Sex Psychology," originally read before the BSSSP in October 1922 and published in the popular collection *Essays of a Biologist* the following year, Huxley asserted his belief in the primacy of biology over psychoanalysis in matters relating to "abnormalities of sexual psychology":

To sum up, then, biological investigation in the first place shows us how certain abnormalities of sexual psychology may be more easily interpreted as caused by comparatively simple physical abnormalities than by the more complex distortions of psychological origin dealt with by psycho-analysis. In the second place, by giving us a broader *aperçu* than can otherwise be gained over the evolution of sex and the direction visible in biological history, it clears up to a certain extent some of the difficulties which the discoveries of the psycho-analytic school have rendered acute.²⁵

²⁵ Huxley, *Essays of a Biologist*, 171. Huxley's italics.

The article “What Determines Sex” in *The Science of Life* contains some curious remarks on homosexuality, but the issue of authorship is unclear. The articles are not individually attributed and private correspondence shows that there was tension between Huxley and the Wellses over the writing process—with H. G. Wells complaining in October 1928 that Huxley did not “work like a professional author at all”.²⁶ The general situation appears to have been that Huxley provided copious amounts of writing by way of draft articles, the Wellses (again in H. G. Wells’s words) “recasting it, boiling it down and getting into shape”.²⁷ The issue of authorship is pertinent when considering the remarks on homosexuality that appear in *The Science of Life*, which repudiate the intersex model that Huxley perpetuated elsewhere and are highly censorious—not Huxley’s style at all. It is likely they were fashioned more by the Wellses and, in this case, there is perhaps no other text discussed in this thesis that better exemplifies the adaptationist model of science popularisation. Having discussed cases of intersexuality, it reads:

The reader, we may remark here, must not confuse these genuine intersex cases, in which structure and function are truly intermediate, with the alleged cases of which he may find accounts in pseudo-psychological works, of perfect men with women’s souls and instincts and perfect women with men’s. There is a literature and discussion of this subject too abundant to ignore, it is associated with queer little cults and practices upon which we will offer no comment, and so it may be well to point out that the facts we are here recording fly right in the face of any such assumptions that there are ladies sadly misplaced in whiskered bodies or vice versa.²⁸

The piece therefore delineated a sharp division between cases of physical intersexuality and “queer little cults” which, by 1929, were being sporadically

²⁶ Erlingsson, “Costs of Being a Restless Intellect,” 106.

²⁷ Ibid.

²⁸ Wells, Huxley, and Wells, “What Determines Sex,” 378.

lampooned and denigrated in Britain's tabloids. Arguing that "disposition follows structure", the piece continues:

Homo sapiens, however, is extraordinarily curious, plastic and suggestible in sexual matters, and through bad influence or unfortunate accidents, he may develop the strangest, most pitiful perversions of desire, matters for the parent, guardian, friendly doctor or mental home rather than for publication and sympathy. The importance of these unfortunate eccentrics is enormously over-rated, both by their adversaries and themselves, and more than half the evil of their misfortune is due to such exaggeration. On the one side a little abnormal thought and behaviour is represented as a terrible crime, on the other hand it is elevated to the dignity of a marvellous distinction. Sexual fuss is rather characteristic of the primates, as any cage of baboons will testify.²⁹

This is not Huxley's writing style or rhetoric, but his name nonetheless imbued the text with authority, even the assertion—made subsequently in the piece—that "[t]here is no reason, however, why biology should be invoked to bolster up perverted ideas or why it should tacitly allow its facts to be misapplied."³⁰

The dismissive reference in *The Science of Life* piece to "ladies" may well be an example of the derision prompted by the British obscenity trial of Radclyffe Hall's lesbian-themed novel *The Well of Loneliness*, raging precisely at the time *The Science of Life* was being written. Published in 1928, the book was successfully prosecuted under the Obscene Publications Act 1857 and ordered to be destroyed. As is well known, Hall drew much of her inspiration for *The Well of Loneliness*, and her life more generally, from Havelock Ellis's *Studies in the Psychology of Sex*, especially *Sexual Inversion*. Huxley, in fact, was marginally involved with the British trial of *The Well of Loneliness*. As Hall prepared her defence, she wrote to Huxley asking for help—in letters that can be found among the Huxley Papers. It is

²⁹ Ibid. Italics in original text.

³⁰ Ibid.

evident that they did not know each other prior to this correspondence, Hall having approached Huxley on the advice of the English psychologist Stella Churchill. In her first letter to Huxley, Hall explained how she had wanted to broach the subject of sexual inversion in fiction in an effort to change “public ignorance” believing that the public would not read scientific textbooks. She asked him to speak publicly at the trial to deny that the book was obscene; “[y]our name would naturally carry great weight”, she wrote. She ended her letter: “I am told it will be an historical case – a fight for the ultimate freedom of the press, but meanwhile my book is in danger of destruction, and my fight for truth may have been in vain, therefore if possible, will you help me?”³¹

Huxley did offer to help, supporting the case that *The Well of Loneliness* was not obscene. In a second letter, dated November 7, 1928, Hall thanked Huxley for his “most valuable support” and his understanding which, she wrote, “has done much to cheer me”. She continued:

The whole business amazes me more and more, indeed it sometimes strikes me as being a kind of demented persecution by those who would always be wilfully blind no matter what truth was presented to them. Such people have always existed in the world, but I feel that we dare not allow them to triumph otherwise it would mean an end to progress. The case will be deeply interesting and I have great cause for gratitude towards yourself and my other supporters.³²

In the event, Huxley turned up at Bow Street but he was not called to testify.

Although he was not allowed to contribute to the proceedings in Hall’s defence, Huxley did object to the outcome of the trial in print, co-signing a letter published in the *Daily Telegraph* (November 22, 1928) that called for a clearer legal definition of obscenity. Huxley was the only biologist who signed the letter; the others were

³¹ Radclyffe Hall to Julian Huxley, October 25, 1928. Julian Huxley Papers. Box 9.

³² Radclyffe Hall to Julian Huxley, November 7, 1928. Julian Huxley Papers. Box 9.

chiefly literary figures including George Bernard Shaw, Vera Brittain, T. S. Eliot, E. M. Forster, Lytton Strachey, and Virginia Woolf.³³

It is evident that others approached Huxley, one of the most famous scientists of the day, for advice about the vexed subject of same-sex desires. E. M. Barraud from North London wrote privately to Huxley on May 24, 1929. She began:

Your name having come before me most frequently in connection with modern biology and because from your writings I have gathered that you are not inhumanly unapproachable, I am writing to ask whether you can help me to studying an aspect of biology in which I am much interested. I refer to congenital sexual inversion in women, the subject of Miss Radclyffe-Hall's condemned book, "The Well of Loneliness." It will doubtless clarify matters if I say at once that my interest is intensely personal. I believe myself to be such an invert.³⁴

Barraud outlined her plight having come to realise, because of the *Well of Loneliness* controversy, the degree to which women such as herself were considered "beyond the pale". It was true, she wrote, that her "earliest tendencies to unusualness" had been condemned by her family, school, and church, but nobody had explained the matter to her, "they only hinted and I never grasped what they were getting at." Barraud had been shocked when she had come across "all those foul adjectives" that had been used during the *Well of Loneliness* trial as she had considered sexual inversion "as a perfectly natural and actually sacred side of life." She was aware of some books on the sexual side of biology; Radclyffe Hall had already recommended some titles to her but, interestingly, Barraud understood that most of these were only available to doctors, scientists, and the clergy. "Can you help me in any way?" she asked Huxley. "I assure you my interest is not morbid, still less mere curiosity, but an intensely personal desire to understand my own position."

³³ Lascelles Abercrombie et al., "'The Well of Loneliness': Legal Definition of Obscenity," *Daily Telegraph*, November 22, 1928, 10.

³⁴ E. M. Barraud to Julian Huxley, May 24, 1929. Julian Huxley Papers. Box 10, file 1.

Focussed as it is on the production and dissemination of sexological knowledge, it is not the aim of this thesis to consider how biology, biologists, and biological ideas and practices relating to sex played in identity formation, but Barraud's letter to Huxley suggests that just such a study would be highly productive. Her reading on the matter demonstrates a significant turn towards biology that diverges sharply from Hall's primary focus on the major late-nineteenth- and early-twentieth-century sexologists. The books that Hall had recommended, which Barraud listed at the end of her letter to Huxley, were Iwan Bloch's *The Sexual Life of Our Time*, Havelock Ellis's *Sexual Inversion*, Richard von Krafft-Ebing's *Psychopathia sexualis*, Otto Weininger's *Sex and Character*, and a translation of a work by Magnus Hirschfeld titled *The Social Problem of Sexual Inversion*. Barraud, however, was evidently more au fait with modernist sexological science than Hall and had augmented Hall's suggestions with additional books "on general aspects of the topic" which, strikingly, were predominantly texts by biologists. Barraud listed *Sex* by Patrick Geddes and J. Arthur Thomson, *Introduction to the Study of Heredity* by E. W. MacBride, *Modern Problems in Biology* by William John Dakin, *Introduction to Heredity and Genetics for Beginners*, both by Carroll Lane Fenton, *The Stream of Life* and *Essays of a Biologist* by Julian Huxley, *The Meaning of Life* by C. E. M. Joad, and *Man and Woman* by Havelock Ellis. Barraud's communication to Huxley thereby evidences the increasing popular explanatory power of biology and of biologists such as Huxley in sex-related matters, at least as much as Ellis and Freud (referred to in this regard by Jeffrey Weeks, cited above), if not more so.

Endocrine Homosexuality II: F. A. E. Crew and Kenneth Walker

An intensification of endocrinological approaches to homosexuality, albeit pursued in piecemeal fashion, was largely prompted by Eugen Steinach and his collaborators as they hastily extended their experiments on laboratory animals (mainly rats) to humans. An outline of this hugely lamentable but nonetheless influential development in modern biology has been given in the introduction to this thesis. The castration and tissue grafting experiments on homosexual men performed by Steinach, Robert Lichtenstern, and Richard Mühsam were reported in Britain. For example, the *British Medical Journal* (March 19, 1921) briefly described Lichtenstern's transplantation experiments, including his claim that "[o]ne homosexual lost all his signs of homosexuality after transplantation, and 7 other cases showed considerable improvement."³⁵ An account of Steinach's experiments was given in the *British Medical Journal* (November 18, 1922) following an address on "Some Medical Novelties in Vienna" by E. W. Scripture to the Medical Section of the British Psychological Society.³⁶ Mühsam's experiments were reported in the *Lancet* (February 3, 1923).³⁷ Demonstrating the complexities of the BSSSP's highly vexed and highly questionable approach towards homosexuality, a lengthy account of Steinach's and Lichtenstern's experiments was made in one of the BSSSP's publications. Titled *Rejuvenation: Steinach's Researches on the Sex-Glands*, the

³⁵ "Transplantation of the Testes in Man," *British Medical Journal*, March 19, 1921, 47.

³⁶ "Vienna: Some Recent Medical Work," *British Medical Journal*, November 18, 1922, 988-89.

³⁷ "Testicle Transplantation," *Lancet*, February 3, 1923, 244-45. See also "Voronov's Operation," *Lancet*, August 21, 1926, 403. Further interest surrounded Steinach's alleged rejuvenation techniques, especially the so-called "Steinach operation". See, for example, "'Rejuvenating' Operations," *British Medical Journal*, March 3, 1923, 34; Peter Schmidt, *The Theory and Practice of the Steinach Operation: With a Report on One Hundred Cases* (London: William Heinemann, 1924); Swale Vincent, *Internal Secretion and the Ductless Glands*, 3rd ed. (London: Edward Arnold & Co., 1924), 117-18. See also "Internal Secretions," *British Medical Journal*, February 21, 1925, 369; "Sex Glands and Endocrine Function," *Lancet*, December 5, 1925, 1182

1923 pamphlet comprises of two papers by BSSSP stalwarts; the first was “Steinach’s Rejuvenation Experiments” by Eden Paul, the second “Recent Developments of Steinach’s Work” by Norman Haire.³⁸ The most thorough English-language account of Steinach’s sexology was his own *Sex and Life: Forty Years of Biological and Medical Experiments*, published in Britain by Faber and Faber in 1940.³⁹ By this time, however, Steinach’s studies were largely passé, surpassed by the new, technologically-driven endocrinology that began to be pursued on an industrial scale from around 1930.

F. A. E. Crew involved himself with the subject of homosexuality very little, although his few published remarks on the subject nonetheless provide insights into the hegemony of endocrinology as a primary means of conceptualising sexual behaviour in mid-twentieth-century Britain. Curiously, Crew maintained prolific use of the term “sexuality” to refer to physical sex differences in ontological and phylogenetic contexts with very little reference to sexual desires and behaviours. As late as 1960 he wrote an article titled “Sexuality, Its Nature and Meaning” referring solely to the component aspects of physical sex (delineated as chromosomes, gonads, internal genitalia, external genitalia, and secondary sexual characteristics).⁴⁰ Such an approach, however, was increasingly unusual and utterly outmoded by 1960.

³⁸ Eden Paul and Norman Haire, *Rejuvenation: Steinach’s Researches on the Sex-Glands* (London: J. E. Francis, 1923).

³⁹ Eugen Steinach and Josef Loebel, *Sex and Life: Forty Years of Biological and Medical Experiments* (London: Faber and Faber, [1940]).

⁴⁰ F. A. E. Crew, *Sexuality and Intersexuality* (London: Printed for the Society by J. E. Francis, 1925); F. A. E. Crew, “Sexuality, Its Nature and Meaning,” *Journal of Postgraduate Medicine* 6 (1960): 101–12. One source (identified from my research on Oxford’s queer history), suggests that Crew was successful in confining the popular perception of his prolific scientific output to questions of physical sex and not of human sexual orientation, but also that he was ridiculed for it. Discussing sexual mores at Oxford in his 1933 essay “Purveyors of Sex-Bunk,” the journalist John Connell (pseud. John Henry Robertson) specified his use of the term “sex”: “‘Sex’ is the word we must cling to. Let us therefore briefly define ‘sex.’ And that is none too easy. The biologist (Professor F. A. E. Crew speaking) ‘talks easily about sex, yet he does not know what sex is.’ He knows what the sexes are—‘male and female created He them’—but he doesn’t know what ‘sex’ is; and he is busy trying to find out. Where the great biologists are modestly reticent, it appears a little unseemly to offer one’s own definition. But—leaving out of consideration spermatozoa, protista, the flowers, the dear little birds, and the lesser

Crew described himself as a political radical and engaged with major social issues of the day, although not to the same extent as Huxley. As a committed and vocal eugenicist, he supported birth control and advocated, in popular texts, incentives for voluntary sterilisation.⁴¹ On the rare occasions when he broached the subject of homosexuality his view appears to have changed. For example, in an article titled “The Influence of Internal Secretions on Sex Characters” in the *British Medical Journal* (September 17, 1927), he reported accounts of testicular transplant in male homosexuals, his rhetoric of normality and therapy suggesting that his view was little different to others, such as Leonard Williams, who entertained endocrinological explanations of homosexuality of the kind that had been pioneered by Steinach. Considering causes of intersexuality, including the possibility that the structure of the gonads might be intersexual, Crew wrote:

[...] it has been suggested that if this were the case the cure for homosexuality might well be implantation or injection of gonadic material. Such treatment has been practised. For example, the testes of a homosexual man have been removed and those of a normal individual implanted, with, it has been claimed, remarkable success. Other cases have not been successful. Such evidence as exists, however, permits one to assume with reason that many cases of homosexuality are due to some endocrine disharmony, though not necessarily a disharmony of an intersexual kind. In other cases it is by no means impossible that external agencies are responsible for the homosexual condition.⁴²

mammals, and confining our attention to human beings—let us make the attempt: sex (or, if you like, sexuality, only it is longer and clumsier) is the matter of one person getting into bed with another.” John Connell, “Purveyors of Sex-Bunk,” in *Red Rags: Essays of Hate from Oxford*, ed. Richard Comyns Carr (London: Chapman & Hall, 1933), 25-43, 27-28. See also Brooks, “Beyond Brideshead.”

⁴¹ See, for example, F. A. E. Crew, “Animal and Human Breeding: An Attempt to Study their Common Principles,” *Eugenics Review* 21, no. 2 (1929): 95-96; F. A. E. Crew, “F. A. E. Crew,” in *Some More Medical Views on Birth Control*, ed. Norman Haire (London: Cecil Palmer, 1928), 91-115.

⁴² F. A. E. Crew, “The Influence of Internal Secretions on Sex Characters,” *British Medical Journal*, September 17, 1927, 483-86, 485.

In his 1931 article on sex for *An Outline of Modern Knowledge*, Crew was more reflective on the issue, entertaining the possibility that the “psychological sexuality of an animal” might be quite different from “physical sexuality”.⁴³ He again referred to Steinach’s experiments on testicular transplants but was on this occasion more critical:

Clinical records seem to show that in this way homosexuality could indeed be cured; but there is reason to think that this experimentation and its clinical application were erroneous, both in conception and in the recorded results. It is well known that the human subject is a very unsatisfactory experimental material. The patient himself rather complicates the experiment by allowing opinion and self-interest to colour his symptoms, and his examination can never be sufficiently objective. Moreover, it is commonly forgotten that there is no real reason why the homosexual should be essentially different from the heterosexual. It is well known that the male of domesticated animals, under certain conditions, very frequently attempts to perform the act of sexual congress with other males. If twelve cocks are kept together, in the absence of females, it is certain that some of these males will be treated by the rest as though they were females. Homosexuality does not consist so much in differences in male behaviour as in the choice of unusual objects. If the appropriate object is absent, or if the individual is unable to identify the proper sex of the object, then copulation will be attempted, but it will be successful only if the partner is the female. It would seem, therefore, that homosexuality is not so much due to a disturbance in the secretions of the endocrine [...] glands, but rather to a disturbance of the central nervous system which results in the choice of an unusual object for the purposes of mating.⁴⁴

Crew’s remarks here maintain a repronormative view of sexual intercourse, coition deemed to be “successful” only if it occurred between a male and female.

Nonetheless, it is striking that the shift in Crew’s view towards a less binary model of sexuality is made in conjunction with reference to non-human (homo)sexual behaviours. Crew briefly considered the relevance of experimental studies of sexual behaviour with the claims made by modern psychology, especially psychoanalysis,

⁴³ Crew, “Sex” [*Outline of Modern Knowledge*], 296.

⁴⁴ Ibid.

which asserted that the wellspring of all mental energy was sexuality. He wrote: “It must be the purpose of future investigation and of theoretical analysis to examine the possibility of interpreting physiological findings such as have been discussed in psychological terms, but attention should now be drawn to the fact that in the case of the experimental animal, at least, the sex-hormone is the creator of sexual energy in the strict sense of the word as well as of general activity and that, in addition, these hormones are intimately concerned with the expression of the higher functions of the nervous system.”⁴⁵

Although Crew wrote little about homosexuality, he was closely involved with the first and only known surgical castration of a homosexual man in Britain, the operation performed with the specific purpose of eradicating or at least alleviating the man’s homosexuality. This occurrence has not previously been known in scholarship. Historians have previously described how male homosexuals, and sex offenders more generally, were castrated as a eugenic measure elsewhere. For example, Theo van der Meer has researched the systematic castration of sex offenders who were hospitalised in an asylum for the criminally insane in the Netherlands from 1938 to 1968.⁴⁶ During this time it is estimated that four hundred male offenders (“psychopaths”) and at least one female offender were “voluntarily” castrated, ostensibly as a therapeutic measure. Supporters of the policy even included homophile sexologists, such as Bernard Premisela and the eugenicist J. Sanders, who actively campaigned against legal discrimination of homosexuals. Merle Wessel has looked at the situation in Scandinavia.⁴⁷ Nazi experiments castrating sex offenders,

⁴⁵ Ibid., 298.

⁴⁶ Theo van der Meer, “Eugenic and Sexual Folklores and the Castration of Sex Offenders in the Netherlands,” *Studies in History and Philosophy of Biological and Biomedical Sciences* 39, no. 2 (2008): 195-204.

⁴⁷ Wessel, “Castration of Male Sex Offenders.”

especially the experiments conducted by Carl Vaernet and Gerhard Schiedlausky at Buchenwald concentration camp, have been documented and discussed by several historians including Günter Grau and Geoffrey J. Giles.⁴⁸

Janet Weston has previously stated that physicians in England were highly sceptical about castrating sex offenders either for eugenic or therapeutic purposes.⁴⁹ There were some isolated cases. Joanna Bourke has discussed Lionel L. Westrope, who castrated at least one nine-year-old boy and two young men at the Poor Law Hospital in Gateshead County Borough (Durham) during the interwar period. Westrope described the boy, Henry Lawton, as “an epileptic, imbecile, unable to talk” who had had his head crushed by forceps when he was born.⁵⁰ Admitted to the hospital after attacking his five-year-old sister, he was reported to “lie on his face and work his body as though having sexual connection”.⁵¹ Lawton’s mother pleaded with Westrope to castrate the boy believing that he might attack more females. Westrope also surgically castrated fifteen-year-old Richard Pegram, who practiced masturbation and had rubbed himself up against a woman, and twenty-two-year-old William George Wilson who was a chronic masturbator, notorious for practicing the habit in public (in common with Lawton’s case, it was Wilson’s mother who pleaded for Westrope to castrate her son). The legality of the operations was called into question and the Chief Medical Officer, George Newman, charged Westrope with unlawfully wounding his patients, although, in practice, Westrope was only chided for “mix[ing] up the therapeutic and sociological aspects of these cases”.⁵²

⁴⁸ Günter Grau, *Hidden Holocaust? Gay and Lesbian Persecution in Germany 1933-45*, trans. Patrick Camiller (London: Cassell, [1993] 1995); Geoffrey J. Giles, “‘The Most Unkindest Cut of All’: Castration, Homosexuality and Nazi Justice,” *Journal of Contemporary History* 27, no. 1 (1992): 41-61.

⁴⁹ Weston, *Medicine, the Penal System and Sexual Crimes*, 76.

⁵⁰ Joanna Bourke, *Rape: A History from 1860 to the Present* (London: Virago, 2007), 147.

⁵¹ *Ibid.*

⁵² *Ibid.*, 148.

While it was undoubtedly the case that British physicians were unenthusiastic about eugenic castration, the subject, and that of associated practices such as testicle grafting, relating to both human and non-human animal subjects was widely discussed in the medico-scientific literature, largely in relation to Steinach's experiments, and helped establish more popular pernicious, eugenically infused narratives about homosexuality in interwar Britain, the influence of which stretched through the second half of the twentieth century.

The operation on a homosexual man with which Crew was involved—he performed a biopsy on one of the excised testicles—was performed not because the patient had been convicted of a sex offence, but to alter his sexuality. Notably, it was performed by Kenneth Walker, an English urological surgeon and prolific author who emerged as a leading sexologist through the 1930s with a string of books about sex aimed at a popular readership (further evidencing their close association, Crew wrote a foreword to a 1951 book by Walker, titled *Marriage: A Book for the Married and the About To Be Married*).⁵³

Walker is an important figure in the homosexuality debates of mid-twentieth-century Britain although very little has previously been written about him by historians in this regard. He was a leading advocate for reform of the law relating to gay sex and became the first chairman of the Homosexual Law Reform Society, founded in June 1958 following the publication of the Wolfenden Report the previous September. His explicit and influential arguments for the legalisation of homosexual behaviour, perpetuated in his popular sexological books and in correspondence published in the major thinking journals (such as the *Spectator*, the *British Medical Journal*, and the *Lancet*) were largely founded on a congenital model

⁵³ Kenneth Walker, *Marriage: A Book for the Married and the About To Be Married* (London: Secker & Warburg for the British Social Biology Council, 1951).

of sexual desire. Walker was, through the 1930s and beyond, a leading proponent of the notion that homosexuality was caused by an endocrinological pathology, reproducing the precepts and practices of Steinach and his interlocutors who had experimented on homosexuals in Germany.

Walker first outlined his position on homosexuality in his 1930 book *Male Disorders of Sex* (a revised edition of the work was published in 1934 as *Sex Difficulties in the Male*). The main disorders/difficulties it treated of were impotence, sexual difficulties in marriage, sexual deviations (mainly homosexuality but also sadism and masochism), masturbation, priapism, continence, and sterility. Walker's chief focus was always on male sexual issues and this is reflected in his narratives on homosexuality. He did, however, sometimes extend his congenital view of homosexuality to women. For example, in the original, 1930 *Male Disorders of Sex* he wrote: "The inborn difference between the invert and the normal person is beautifully portrayed in Miss Radclyffe Hall's *The Well of Loneliness*, which, although it may be a melancholy piece of literature, at any rate furnishes a magnificent portrait study of an invert."⁵⁴ Others of Walker's sexological works, especially the Pelican paperbacks *The Physiology of Sex and Its Social Implications* (1940; 2nd ed. 1954) and *Sex and Society* (1955, co-authored with the psychiatrist Peter Fletcher), perpetuated Walker's adjoined congenital view of homosexuality and his arguments for law reform.

Walker sought continually to mediate and synthesise the view that homosexuality was congenital and the view that it was psychological or acquired and he generally avoided being too categorical or accepting the assertions of other sexological writers unreservedly. Still, however, it is evident that he favoured

⁵⁴ Kenneth M. Walker, *Male Disorders of Sex* (London: Jonathan Cape, 1930), 89.

endocrinological explanations. In the original 1930 edition of *Male Disorders of Sex*, he wrote of homosexuality as a “pathology”, “condition”, “abnormality”, and, even as he moved to present a progressive approach, as an “inherited evil”.⁵⁵ Although he clearly believed that homosexuality could be inherited, he offered little by way of elucidation for the view; for the most part, he wrote of the physical aspects of homosexuality in terms of endocrinology. In this regard Walker was heavily influenced by the experiments of Steinach, especially, at this stage, Steinach’s identification of large epitheloid cells, similar to those found in the luteal cells of the ovary rather than typical male interstitial cells, in the stroma of the testes of male homosexuals.

Walker acknowledged that other biologists (including Magnus Hirschfeld) had failed to replicate Steinach’s observations but he nonetheless gave great credence to endocrinological theories of homosexuality, insisting that, despite their hypothetical premises, “the fact remains that strong evidence exists in favour of the condition being associated with a disturbance of endocrine function.”⁵⁶ His discussion of the treatment of homosexuals also reflected his bias towards endocrinology. He outlined Lichtenstern’s castration of a homosexual man in detail and referred to the operation carried out by Müsham. “In other hands the treatment has failed”, Walker wrote but again moved to mute the existence of null findings by suggesting that in the failed operations “other endocrines besides the testes were involved.”⁵⁷

Walker largely wrote of the psychological view of homosexuality as reflecting the biological (“we find that it is becoming less and less incompatible with

⁵⁵ Ibid., 88, 91, 96.

⁵⁶ Ibid., 90.

⁵⁷ Ibid., 94.

the endocrine theory”).⁵⁸ He (rightly) noted that both Richard von Krafft-Ebing and Iwan Bloch had embraced the congenital view having previously championed psychological models. Sigmund Freud, Walker wrote, “has brought the psychological school of thought still more into line with the physical.”⁵⁹ Walker was unenthusiastic about psychological treatments (psychoanalysis). This “line of attack”, he wrote (with little sense that the same situation had failed to dent his enthusiasm for hormonal approaches), “rational as it may be, is not uniformly successful.”⁶⁰ He suggested that the best results from psychoanalysis were achieved with bisexuals but was otherwise pessimistic about the potential of analysis to cure homosexuality without being accompanied by hormone treatment.

Walker’s narrative moves deftly from the subject of treatment to that of law reform, a cause he pursued founded on his belief that homosexuality was in many cases congenital. Arguing that “medical knowledge must make its contribution to the formation of a sane public opinion”, he wrote:

Already more enlightened people are beginning to realize that in the past ignorance of the nature and causes of sexual inversion has been productive of much cruelty. But the law, since it reflects the thought of the main mass rather than of the vanguard, still lags behind and continues to treat the invert as a criminal who is deliberately pursuing evil. Some day, perhaps, when the general public understands that the invert has no choice but is an unfortunate creature who has inherited rather than acquired the stigma that distinguishes him from his fellow, the law will be altered. Imprisonment will then be regarded as unsuitable and as inadequate for the treatment of homosexuality as it is now regarded as unsuitable for the treatment of insanity. In the meantime the work of bringing public opinion into line with knowledge remains in our hands.⁶¹

⁵⁸ Ibid., 91.

⁵⁹ Ibid.

⁶⁰ Ibid., 94.

⁶¹ Ibid., 95-96.

The 1934 edition of Walker's book, retitled as *Sex Difficulties in the Male*, was thoroughly revised but largely echoed his earlier analysis. Still, there are some significant innovations to his discussion of homosexuality. Possibly he had encountered some resistance to his pathological diagnosis for he began his revised chapter on sexual deviations with a defence of his use of the term "sexual abnormalities" rather than accepting homosexuality as a normal variant of human sexual behaviour, asserting:

It is true that there are as many patterns of sex as there are different individuals, but whilst the variations are many they can only be considered normal if at some point they include the 'procreative end for which all sex exists.' Homosexuality, therefore, cannot be deemed normal since by its very nature it has no connection with the normal function of sex.⁶²

Walker added a brief nod to the arguments of those who accepted homosexuality as natural, adding zoological, ethnographic, and historical dimensions to his narrative, but without himself embracing them:

Homosexuality is so widespread that many have come to look on it as a natural phenomenon exhibited not only by human beings but by the lower animal world. In the past and even in the present amongst savage races homosexuality has been treated with reverence, so that the ancient Egyptians endowed even their gods Horus and Set with homosexual desires.⁶³

Walker nonetheless returned to his congenital, pathological model. "Whatever the true explanation of homosexuality may be," he wrote, "it will be seen that it is being more and more accepted as a congenital condition with a definite physical basis."⁶⁴ Notably, he did move away from Steinach's claim to have identified female cells in

⁶² Kenneth M. Walker, *Sex Difficulties in the Male*, revised ed. (London: Jonathan Cape, 1934), 124.

⁶³ Ibid., 126.

⁶⁴ Ibid., 130.

the testes of homosexual men, instead favouring the view, forwarded by Crew, that (male) homosexuality resulted from imperfect action of male hormones on the body, occurrences of which might arise from what Walker, again following Crew, termed “imperfect sexual differentiation”.⁶⁵

Walker therefore echoed Crew’s shift away from Steinach; the reason for this move possibly having much to do with the operation that Walker performed to remove the testicles of a man in an attempt to remove or reduce the patient’s homosexuality. His description of this is by far the most striking addition to the revised, 1934 edition of *Sex Difficulties in the Male*. He did not provide much information about the operation, stating only that he had performed it “[r]ecently” and that “[m]ore than once I have been asked to save a homosexual from the risk of prison, by such a violent remedy as castration.” He had previously refused such requests, he said, on the grounds that even with the patient’s consent, castration “would carry with it too great a risk of upsetting completely his mental balance”.⁶⁶ But he made an exception for a thirty-six-year-old man whose case Walker felt to be desperate and urgent.

Walker described the man as “of a very low grade of intelligence and completely obsessed by his abnormal desires”.⁶⁷ He was in the habit of publicly cruising for sex, searching “for anyone who could be the means of gratifying his desire for practices which can only be described as bestial”.⁶⁸ Walker further wrote that the man was suicidal. At the patient’s request, and the risks having been explained to him and his family, Walker carried out the operation. He saw the patient four months later, reporting that he was in improved physical and mental health.

⁶⁵ Ibid., 129.

⁶⁶ Ibid., 139.

⁶⁷ Ibid.

⁶⁸ Ibid.

About every three weeks the man still experienced desire for sex with men (Walker equating these episodes with the periodic “emotional unrest” experienced by women during menstruation) but that he was able to keep such desires under control. For the most part, Walker wrote, the man’s desires for good looking men were aesthetic rather than actively sexual.

Crew examined one of the patient’s extracted testicles, but Walker wrote little about the circumstances of this, stating only that “Professor Crew’s report on the removed testicle is appended”.⁶⁹ Crew’s biopsy reads:

The testis contains numerous tubuli with free lumen. No spermatogenesis is present in any tubule of the region sectioned; the Sertolian layer is of normal appearance; a few heads of spermatozoa are still present in the tubuli, which contain the typical detritus of this type of atrophy. The interstitial tissue fills up much space since the tubuli are shrunk and thus of irregular shape; but the interstitial tissue consists almost entirely of connective elements and contains extremely few typical Leydig’s cells. There is no indication of the so-called luteoid cells which have been stated to be present (Steinach and others) in cases of homosexuality.⁷⁰

Possibly the failure to identify luteoid cells contributed to the rejection of Steinach’s claims which is discernible in both Crew’s and Walker’s writings.

Aside from its inclusion in Walker’s 1934 *Sex Difficulties in the Male*, Crew’s analysis appears to have been otherwise unpublished or alluded to. Interestingly, Walker’s account of the operation was dropped from subsequent editions of the work. Possibly the legal problematics of the procedure were drawn to his attention. That said, there is some further reference to an operation, most likely Walker’s but just possibly a different case. It is described in the regular “Any Questions?” section of the *British Medical Journal*, an anonymous forum for medical professionals to seek advice on matters about which they were unknowledgeable. In

⁶⁹ Ibid., 140.

⁷⁰ Ibid.

the edition dated October 23, 1954, under the header “Castration of a Male Homosexual,” an anonymous correspondent, possibly a surgeon, wrote that he had been asked by a physician to castrate a man, aged fifty-two. The man was said to have a grown-up family but that he was homosexual and was anxious to be “cured” and would readily submit to orchidectomy if he could. The correspondent stated that they had no information about the matter and sought an authoritative opinion about whether such an operation would “be likely to achieve the result desired.” The response, again anonymous (but most likely Walker), reads:

Castration other than for therapeutic purposes is an illegal operation. I carried it out 20 years ago on a homosexual of a very low type, liable to imprisonment, at the instigation of a well-known psychologist and of the patient’s practitioner, with satisfactory results. In other words, the patient was able afterwards to control his homosexual urge. But such an operation is no longer necessary. The patient should be put on stilboestrol or some equivalent hormone. This will suppress his sexual desire and, if continued long enough, will bring about physiological castration.⁷¹

Both the question and the response are indicative of the intensification of the homosexuality debates of the post-1945 era (the exchange appearing very soon after the momentous Home Office Departmental Committee on Homosexual Offences and Prostitution had been convened, in August 1954), and of how medico-scientific ideas and practices developed through the earlier, interwar period informed those debates. An analysis of the postwar period (including the use of stilboestrol on sex offenders) is beyond the scope of this thesis, but the casual admission that a homosexual man was castrated around 1934 in an attempt to control expression of his homosexuality is further evidence that disputed endocrinological models of homosexuality prompted

⁷¹ “Castration of a Male Homosexual,” *British Medical Journal*, October 23, 1954, 1001.

such highly invasive medical interventions, perhaps more commonly than is currently known.

Ambiguous Genealogies of Homosexuality

Kenneth Walker alluded to homosexuality as an “inherited evil”, but provided little by way of elucidation for the assertion. The remark is typical for the interwar period which maintained several notions of the heritability of homosexuality, none of which had much by way of a substantial basis in scholarly science. Nonetheless, and reflecting a situation that this thesis has already demonstrated as being inherent to sexological biology as it was developed from around 1900, the idea of the heritability of homosexuality was amenable to various pathological interpretations but was, at the same time, useful to those who argued that homosexuality was natural and should therefore be decriminalised.

A formative example of how the idea that homosexuality was heritable gained credence in medico-scientific, socio-political, and legal debates about human sexualities that emerged as such a prominent focus of popular and professional interest through the interwar era is found in the sensational libel prosecution of Noel Pemberton Billing, the provocative MP for Hertford. The case has been described in detail by Philip Hoare. In January 1918, Billing accused the Canadian-born actress and *Salome* dancer Maud Allan of being a lesbian. Part of the defence’s case was that sexual insanity ran in Allan’s family, her brother having been executed in San Francisco in 1898 after being convicted of murdering two women. The suggestion

that Allan was a hereditary sexual degenerate was further underscored by A. D. Serrell Cooke, who Billing called as a medical witness.

Cooke was a TB expert but had worked in the psychiatric department of St Mary's, Paddington where he had read Richard von Krafft-Ebing's *Psychopathia sexualis*. Cooke produced a detailed analysis of Wilde's *Salome* (Cooke's analysis being "a mélange of pseudo-analysis and quack diagnosis" according to Hoare) largely based on *Psychopathia*'s lurid descriptions of sadism.⁷² To boot, Wilde's most famous former lover Lord Alfred Douglas testified that Wilde had written *Salome* just after having read *Psychopathia*. Asked in court by Billing if sadism was hereditary, Cooke responded: "It occurs in families which have an hereditary taint either of insanity or some other neuropathic condition [...] It is congenital; it is born in a person."⁷³

One of the most striking consequences of the Billing trial goes undiscussed by Hoare—namely, the attention it and the subject of homosexuality received in the medical press. This again shows that correspondence in leading periodicals can provide historians with some unique insights into pertinent issues and events (the Billing case indeed predating the correspondence led by Leonard Williams, discussed above). In the letters pages of the *Lancet* (June 22, 1918), under the title "Sexual Perversion" Lionel Alexander Weatherly, a Bournemouth-based psychiatrist, used the trial to comment on sexological nosology, believing that his "long experience of mental diseases" permitted him "to write with definite knowledge on the subjects discussed in the course of the unsavoury trial of Mr. Pemberton Billing."⁷⁴ Weatherly wrote that, despite efforts by (mainly German) authorities, sexual perversion

⁷² Philip Hoare, *Wilde's Last Stand: Scandal, Decadence and Conspiracy During the Great War*, revised ed. (London: Duckworth Overlook, 2011), 144.

⁷³ *Ibid.*, 146.

⁷⁴ Lionel A. Weatherly, "Sexual Perversion," *Lancet*, June 22, 1918, 884-85, 884.

remained to be precisely differentiated. He made a five-fold categorisation, delineating (1) perversion caused by insanity, (2) inherited perversion, (3) accidental perversion (caused, for example, by accidents, operations, and alcoholism), (4) perversion resulting from “jaded and worn-out normal sexual feelings”, and (5) perversion resulting from “fear of the consequences of normal sexual intercourse in both sexes.” Of this last category Weatherly commented that “[o]ur declining birth-rate proves the existence of this, and there is here an association with Lesbianism.”⁷⁵ He ended his letter with the following:

Attempts have been made in several countries and for many years to get sexual perversions considered as no criminal offence, and even to prove that these perversions are really more moral than the natural normal sexual act. I think legislation should deal more stringently with cases which do not come under the classes 1 and 3, where the offenders should be considered as irresponsible, and cases for care and treatment, rather than punishment.⁷⁶

Weatherly’s letter received one response, from the eminent English physician and member of the prison service H. Bryan Donkin, which was published in the edition of the *Lancet*, dated July 13. Donkin took issue with Weatherly’s nosology, believing all its categories to be open to question but confining his comments to the category of inherited perversion which, Donkin wrote, “plays the most prominent part among the five classes he enumerates, and the implications of this very indefinite term were made use of in the late libel action to which Dr. Weatherly refers.”⁷⁷ Donkin pointed out that Weatherly appeared only to be referring to homosexuality, or as Donkin put it, “any manifestation of sexual excitement, desire for sexual contact, or actual sexual contact with a person of similar sex, or, in other

⁷⁵ Ibid., 885.

⁷⁶ Ibid.

⁷⁷ H. Bryan Donkin, “‘Sexual Perversion’,” *Lancet*, July 13, 1918, 56. Italics in original text.

words, homo-sexual tendencies in either sex.”⁷⁸ Donkin believed that Weatherly had omitted to consider youthful sexual desires which, he argued, were undifferentiated:

It is surely more correct to attribute these manifestations rather to a natural, unrecognised, undifferentiated, and unguided sexual instinct than to a naturally abnormal and necessarily perverted instinct. In a majority of such cases *right guidance* of these instincts, all too much neglected by those who have it in their power to give such guidance, would either prevent or readily correct such indulgences on the part of the young, who are really ignorant of the nature of the desires which move them.⁷⁹

Donkin further cautioned that another consequence of reliance upon a vague notion of inherited perversion was that “it may lead to the provision of excuses to those who certainly cannot plead ignorance for conduct to which penal coercion may be more fitting.”⁸⁰

Weatherly responded to Donkin in a letter published in the edition of the *Lancet* dated July 27. He deferred to Donkin’s experience but nonetheless maintained that inherited sexual perversion, or rather “inherited disposition to sexual perversion”, accounted for a large number of cases.⁸¹ A brief correspondence, it was nonetheless unprecedented for the British medical press, and a far cry from the vicious attitude adopted to the subject by the *British Medical Journal* and the *Lancet* throughout the Edwardian era. It is a formative example of a legal case prompting a debate about homoeroticism in the correspondence sections of the British medical press, a pattern that would subsequently be echoed repeatedly over the ensuing decades.

⁷⁸ Ibid.

⁷⁹ Ibid.

⁸⁰ Ibid.

⁸¹ Lionel A. Weatherly, “Sexual Perversion,” *Lancet*, July 27, 1918, 125.

Notwithstanding such an interesting, albeit modest, move on the part of the *Lancet*, the attitude of the editorial office of the *British Medical Journal* remained profoundly bigoted and initially unmoved by the rapid development of new medico-scientific approaches towards sexuality through the post-First World War era. A short notice in the edition dated June 8, 1918, and titled “The Billing Case,” asserted that the trial “was conducted in such a manner as to bring to the notice of a very wide public an evil which is apparently an invariable accompaniment of civilization when it reaches the stage of luxury.”⁸² Echoing the attitude that had been adopted at the trial, the piece argued that “the practices of sexual perverts” were usually congenital, even referencing Krafft-Ebing as an authority on the matter (somewhat hypocritically given the *British Medical Journal*’s earlier condemnation of Krafft-Ebing and *Psychopathia*).⁸³ In other cases, the piece asserted, sexual vice was “developed by example and precept in individuals of unstable sexual equilibrium who, without such stimulation, would never spontaneously have given evidence of perversion.”⁸⁴ For the reason, the piece concludes, most people considered such lapses best treated by “police methods”.⁸⁵

While *Psychopathia* continued to be read through the early and middle decades of the twentieth century, it was Magnus Hirschfeld and his interlocutors who were integral in establishing that homosexuality was heritable, although they continued to conflate that premise with lingering notions of degeneracy.⁸⁶ In his major 1914 book *Die Homosexualität des Mannes und Weibes*, Hirschfeld discussed

⁸² “The Billing Case,” *British Medical Journal*, June 8, 1918, 660.

⁸³ Ibid.

⁸⁴ Ibid.

⁸⁵ Ibid.

⁸⁶ The German primary sources relating to notions of the heredity of homosexuality deserve greater attention in English-language scholarship, but for a brief discussion see Laurie Marhoefer, *Sex and the Weimar Republic: German Homosexual Emancipation and the Rise of the Nazis* (Toronto: University of Toronto Press, 2015), 136-38.

various biological theories of homosexuality, including a bold eugenic theory forwarded by the Dutch sexologist Lucien von Römer, initially forwarded in 1905 in a journal edited by Hirschfeld under the title “Die erbliche Belastung des Zentralnervensystems bei Uraniern, geistig gesunden Menschen und Geisteskranken” (The Hereditary Burden on the Central Nervous System in Uranians, Sane People, and the Insane) and again in von Römer’s *Die Uranische Familie: Untersuchungen über die Ascendenz der Uranier* (The Uranian Family: Investigations into the Ancestry of Uranians; 1906, originally published in Dutch in 1904).⁸⁷

It was von Römer’s view that homosexuals were to be understood as a natural variation rather than as degenerate individuals; indeed, von Römer viewed homosexuals as some kind of antidote to degeneration. Outlining a complex system of heredity, he explained that a homosexual was born to parents who demonstrated clear signs of degeneration but whose line was, effectively, salvageable. Perfectly fit and healthy in and of themselves, but not destined to reproduce, for von Römer homosexual offspring nonetheless embodied a release or discharge of the familial degeneracy, allowing their siblings to overcome the family taint and produce healthy children.

Hirschfeld himself did not fully subscribe to von Römer’s theory of regeneration, finding it too complicated. Instead, he forwarded a simpler theory whereby homosexuals existed more as a natural preventative measure against degeneration. Although there was no English translation of Hirschfeld’s *Die Homosexualität des Mannes und Weibes* (at least until the year 2000) his ideas were disseminated in other texts. For example, the posthumously published *Sexual Anomalies and Perversions: Physical and Psychological Development and*

⁸⁷ See Hirschfeld, trans. Lombardi-Nash, *Homosexuality*, 450-51.

Treatment, completed by Hirschfeld's students after his death in May 1935 and published in Britain in 1937, contains a precis of his highly problematic eugenic position on the heredity of homosexuality:

The assumption that Nature makes use of homosexuals to prevent degeneration is borne out by the marriages and descendants of homosexuals. Many of these marriages are childless, but when they are not, the children are mostly of inferior mentality, unless a particularly healthy partner in the marriage brings about a comparative compensation. At all events, from the viewpoint of race hygiene the marriage of a homosexual is a risky undertaking.⁸⁸

The work goes on to state that homosexual brothers and sisters were comparatively very frequent, and that Hirschfeld endorsed von Römer's view that "homosexuality runs in families in at least 35 per cent of the cases".⁸⁹

Havelock Ellis also referred to Hirschfeld's and von Römer's positions in his 1933 book *Psychology of Sex: A Manual for Students*, a single-volume version of his multivolume *Studies in the Psychology of Sex* (the book was republished as a Pan paperback in 1959). The shorter work, written for purpose, is especially notable for being the first of Ellis's sexological works to be legitimately published in Britain since *Sexual Inversion* was banned in 1898, and its publisher shut down by the police early in 1902. All of Ellis's *Studies* were thereafter published in the United States. Although copies, including *Sexual Inversion*, could be bought in Britain one way or another, through the early years of the twentieth century, *Psychology of Sex* nonetheless made Ellis's sexology, updated for the 1930s, available to a broader audience. The chapter on homosexuality, Ellis's last appraisal of the subject (he died

⁸⁸ Magnus Hirschfeld, *Sexual Anomalies and Perversions: Physical and Psychological Development and Treatment* (London: Francis Aldor, [1938]), 278-79. The work is undated but a note in the second edition, which was edited by Norman Haire, states that it was originally published in 1938.

⁸⁹ *Ibid.*, 279.

in July 1939), incorporates the prevailing view that genetic sex is variable. In Ellis's words:

We are thus brought to what may be regarded as the fundamental basis in biological constitution on which, when we go outside the psychological field, homosexuality can be said to rest. It may seem easy to say that there are two definitely separated distinct and immutable sexes, the male that bears the sperm-cell and the female that bears the ovum or egg. That statement has, however, long ceased to be, biologically, strictly correct. We may not know exactly what sex is; but we do know that it is mutable, with the possibility of one sex being changed into the other sex, that its frontiers are often uncertain, and that there are many stages between a complete male and a complete female.⁹⁰

Ellis aligned the genetics of sex, as it was understood in the early 1930s (he cited F. A. E. Crew as authority on the matter and outlined Goldschmidt's experiments on moths but without naming Goldschmidt) with the positions of late-nineteenth- and early-twentieth-century sexologists who had sought to explain homosexuality by recourse to concepts of intersexuality. These included Karl Heinrich Ulrichs, James Kiernan, Julien Chevalier, José de Letamendi, Richard von Krafft-Ebing, Magnus Hirschfeld, and himself. On heredity, Ellis largely echoed Hirschfeld, stating that "some degree of morbidity or abnormality—eccentricity, alcoholism, "neurasthenia," etc." was found in families of some inverts, this was not the case in at least fifty percent of cases. Ellis continued:

The heredity of inversion is well-marked, though it has sometimes been denied; sometimes a brother and sister, a mother and son, an uncle and nephew, are both inverted, even unknown to each other; I find this family or hereditary inversion in 35 per cent. cases, and von Römer has found exactly the same proportion. It is alone sufficient to show that inversion may be inborn. The general personal health is in about two-thirds of the cases good, and sometimes very good; among the remainder there is often a tendency to nervous trouble or to a more or

⁹⁰ Havelock Ellis, *Psychology of Sex: A Manual for Students* (London: William Heinemann (Medical Books), 1933), 194.

less unbalanced temperament; only a small proportion (about 8 per cent. in my experience) are markedly morbid.⁹¹

Other studies echoed Hirschfeld's approach, producing detailed genealogies of individuals identified as homosexual. For example, Walter Wolf, a neurologist based at Hirschfeld's pioneering Institut für Sexualwissenschaft (Institute for Sexology), published a significant study in the *Archiv für Psychiatrie und Nervenkrankheiten* in 1925.⁹² It was, however, largely in response to Hirschfeld's advocacy of the naturalness of homosexuality, framed within a liberationist context albeit with a eugenic bent, that alternative interpretations were forged. Under National Socialism, a vehemently pathological construal of homosexuality appropriated, and then forcibly eclipsed, the sexological studies of Hirschfeld and others who had suggested a hereditary link to homosexuality. Even before Hirschfeld's Institut was brutally suppressed in May 1933, Nazi eugenicists sought to assign homosexuality (and other sex variations) a pathological diagnosis, an endeavour that ventured beyond Germany. For example, *Menschliche Erblichkeitslehre* (1921; 4th ed. 1932-36), a veritable textbook of Nazi genetics co-authored by the influential Nazi geneticists and racial hygienists Erwin Baur, Eugen Fischer, and Fritz Lenz, was published in English translation, rendered by Eden and Cedar Paul, in London by George Allen and Unwin and New York by the Macmillan Company as *Human Heredity* in 1931.

⁹¹ Ibid., 198.

⁹² Walter Wolf, "Erblichkeitsuntersuchungen zum Problem der Homosexualität," *Archiv für Psychiatrie und Nervenkrankheiten* 73, no. 1 (1925): 1-12. Researching this thesis, I identified another familial study of homosexuality, previously unknown to scholarship, by the Polish psychiatrist Jan Piltz. Jan Piltz, "Przyczynek do nauki o homologicznej dziedziczności w przypadkach homoseksualizmu," *Przegląd Lekarski* 60 (1921): 29-31. I would like to thank Rigels Halili for providing an English translation of the article.



Fig. 9. This image and short report describes the destruction of Hirschfeld's Institut für Sexualwissenschaft by the Nazis on May 6, 1933. *The Illustrated London News*, May 20, 1933.

In the book Lenz, professor of racial hygiene at the University of Munich, identified homosexuality as "[t]he most important anomaly of the reproductive impulse" in a lengthy chapter on "Morbific Heredity Factors".⁹³ Lenz was convinced that homosexuality originated from a genetic basis and was therefore hereditary. He acknowledged that there was a dearth of evidence that showed conclusively that "this disorder of the sexual impulse" ran in families but thought this might be attributable to the problem of garnering information from subjects about something that was widely regarded with disapproval.⁹⁴ Lenz concluded his commentary by pre-empting any argument that a genetic basis suggested normality. "Homosexuality," he wrote,

⁹³ Erwin Baur, Eugen Fischer, and Fritz Lenz, *Human Heredity*, trans. Eden and Cedar Paul (London: George Allen & Unwin / New York: Macmillan Company, [1927] 1931), 463.

⁹⁴ *Ibid.*, 464.

“[...] cannot be regarded as a normal or quasi-normal variant, as its organised defenders are wont to declare. It is unmistakably morbid, being markedly antagonistic to race preservation.”⁹⁵

Other notions of homoeroticism as pathologically heritable derived from Nazi eugenicists impacted in interwar Britain. In 1931 Richard Goldschmidt abandoned his intersex theory of homosexuality (he suggested instead, somewhat vaguely, that homosexuality might be caused by an inherited change in the reactivity of brain tissue to hormones). Still, however, the genetics of sex remained a highly contested arena. In this scenario, Goldschmidt’s “balance” theory maintained a heavy presence in the postwar medico-scientific imagination. Michael R. Dietrich has discussed the continuation of Goldschmidt’s theory of homosexuality as a case of genetic intersexuality in the work of Theo Lang.⁹⁶ Lang was an assistant in the Genealogical-Demographic Department of Munich’s Deutsche Forschungsanstalt für Psychiatrie (German Institute for Psychiatric Research), run by Swiss-born German psychiatrist, geneticist, and Nazi racial hygienist Ernst Rüdin, an early and enthusiastic supporter of National Socialism. In collaboration with his brother-in-law, and architect of Nazi racial hygiene, Alfred Ploetz, Rüdin co-founded the Deutsche Gesellschaft für Rassenhygiene (German Society for Racial Hygiene) and, as a member of a committee on racial hygiene headed by Heinrich Himmler, played a major role in drafting the German sterilisation law for psychiatric patients, promulgated with murderous consequences in July 1933.

Lang was an expert in using statistical methods for determining Mendelian traits within populations, an approach championed by Rüdin for identifying latent

⁹⁵ Ibid.

⁹⁶ Michael R. Dietrich, “Of Moths and Men: Theo Lang and the Persistence of Richard Goldschmidt’s Theory of Homosexuality, 1916-1960,” *History and Philosophy of the Life Sciences* 22, no. 2 (2000): 219-47.

carriers of genetic and psychiatric conditions. Prior to 1935, Lang's work had largely focussed on feeble-mindedness and cretinism. Dietrich surmises, reasonably so, that Lang's interest in the subject of homosexuality around 1935 was closely associated with his career ambitions within the Nazi regime. Attitudes towards homosexuals, which had been relatively relaxed through the Weimar era, took a sharp turn for the worse following the rise of Hitler's National Socialists. Hirschfeld's Institut was violently suppressed in May 1933. Homosexual Nazis, among them SA leader Ernst Röhm, were among those who were murdered during the Night of the Long Knives (June 30-July 2, 1934). In 1935, the provisions of Paragraph 175 of the German criminal code that had long criminalised homosexual behaviour were broadened to introduce tougher punishments for any activities between men that could be deemed to be an "offense to the sense of shame".⁹⁷

Lang published his first article (in German) on male homosexuality in 1936 and wrote numerous more thereafter. Although he acknowledged that Goldschmidt had abandoned the theory, Lang nonetheless used Goldschmidt's earlier work, Lang applying his statistical techniques in an effort to establish that homosexuality was a form of intersexuality, just as Goldschmidt had earlier claimed. Using Munich police records of around 500 men who had been arrested for violations of Paragraph 175 and prostitution, Lang analysed familial factors including mother's age, father's age, and, most significantly, intrafamilial sex ratios. Of the latter measure, he reported a higher incidence of brothers/males in family lineages (121.8:100 compared to an

⁹⁷ On Nazism and homosexuality generally, see, for example, Marhoefer, *Sex and the Weimar Republic*; Andrew Wackerfuss, *Stormtrooper Families: Homosexuality and Community in the Early Nazi Movement* (New York: Harrington Park Press, 2015); Geoffrey J. Giles, "The Denial of Homosexuality: Same-Sex Incidents in Himmler's SS and Police," *Journal of the History of Sexuality*, 11 no. 1/2 (2002): 256-90; Pierre Seel, *I, Pierre Seel, Deported Homosexual: A Memoir of Nazi Terror*, trans. Joachim Neugroschel (New York: Basic Books, [1994] 1995); Grau, *Hidden Holocaust?*; Giles, "The Most Unkindest Cut of All"; Richard Plant, *The Pink Triangle: The Nazi War against Homosexuals* (New York: Henry Holt and Company, 1986).

average of 106:100), which—despite acknowledging various difficulties with his study—he took as evidence that male homosexuals were genetic females.

Lang's analysis was swiftly criticised by the Berlin psychiatrist Johannes Heinrich Schultz, who offered an alternative, psychological explanation (he suggested that in families with “evil” mothers and “kind” fathers, brothers would share a tendency towards homosexuality).⁹⁸ Still, Lang continued to pursue his statistical studies of male homosexuality, and defend his interpretation of them, expanding his database to incorporate police records from Hamburg. Following a serious dispute, ostensibly over finances, with Rüdin (which in fact coincided with the takeover of the Institute by the SS), Lang wrote only sporadically about homosexuality after 1941 (in December that year he left Germany for Switzerland where he pursued further research on cretinism). His last article on the subject, which continued to maintain the validity of his intersex theory of homosexuality, was published in 1960.

Lang's studies on male homosexuality were discussed widely in British and American medical writing. A brief report in the *British Medical Journal* (October 1, 1938), for example, reported that “Lang brings further figures in support of his theory that a great number of homosexuals are so by virtue of a genetic factor.”⁹⁹ The only article on homosexuality that Lang himself published in English, entitled “Studies on the Genetic Determination of Homosexuality”, appeared in the US-published *Journal of Nervous and Mental Disease* in July 1940. Lang wrote: “in the majority of homosexual individuals, the primary cause may be a heredito-constitutional rather than a purely psychological mechanism, explainable, under

⁹⁸ Dietrich, “Of Moths and Men,” 234.

⁹⁹ “Zeitschrift für die Gesamte Neurologie und Psychiatrie,” *British Medical Journal*, October 1, 1938, 104.

certain conditions, by the assumption of hormonal influences. At present, of course, it can merely be suggested that these hormonal disturbances, especially when occurring in the earliest embryonic stage, may be based in themselves on a specific genetic phenomenon.”¹⁰⁰ Further objections to Lang’s studies were made well into the postwar era, but even as they were resolutely disproved, they were rehearsed again and again through the homosexuality debates of the 1940s and 50s and beyond, often only to be rejected, but without consideration of their Nazi origins.¹⁰¹ For example, notions of the heritability of homosexuality entered into British criminological discourse through William Norwood East.¹⁰²

Notions of the heritability of homosexuality were also fuelled by the proliferation of twin studies, a (hugely problematic) means of identifying familial traits that was pioneered by Francis Galton. Theo Lang discussed the issue of twins as part of his studies on homosexuality, although his database of police records only included eleven probands who were a twin and in no case was the second sibling a homosexual proband. Notable in this regard is the 1929 book *Verbrechen als Schicksal: Studien an kriminellen Zwillingen* by the German physician Johannes Lange. The work was published in Britain in 1931 as *Crime as Destiny: A Study of Criminal Twins*, translated by Charlotte Haldane and with a foreword by J. B. S. Haldane. Two of the many case studies Lange outlined involved homosexual offences.

¹⁰⁰ Theo Lang, “Studies on the Genetic Determination of Homosexuality,” *Journal of Nervous and Mental Disease* 92, no. 1 (1940): 55-64.

¹⁰¹ Some examples of works citing Lang available in Britain, include Karl Jaspers, *General Psychopathology*, trans. J. Hoenig and Marian W. Hamilton (Manchester: Manchester University Press, [1946] 1963), 632; D. J. West, *Homosexuality* (London: Gerald Duckworth & Co., 1955), 69-70; Gordon Westwood, *Society and the Homosexual* (London: Victor Gollancz, 1952), 36.

¹⁰² William Norwood East, *Sexual Offenders* (London: Delisle, 1955), 39; William Norwood East, “Sexual Crime,” *Journal of Criminal Science* 1 (1948): 45-83, 63-64.

The first, the Maat brothers, were dizygotic twins. They were described as coming from an excellent family, but both brothers suffered various neuroses and had been difficult to bring up. At the time their case was documented, they were in their mid-twenties and Lange described them as “extremely cold, egocentric beings, without any human affections, without sympathy, respect, or affection for their parents or anyone else.”¹⁰³ He continued: “Occasionally, when examining them, it appeared as if one might still discover one or another more or less human affection in them, but it only turned out that at bottom they were both, and had been for a long time, sexual invert.”¹⁰⁴ One of the brothers had been imprisoned for homosexual offences. Other members of their families were not invert although, Lange wrote, “they do reveal other sexual anomalies.”¹⁰⁵ At the time Lange was writing, one of the brothers was leading a predominately heterosexual life, the other a bisexual one, yet Lange concluded that “[i]t is unquestionable that in this case innate tendencies predominate.”¹⁰⁶

Lange also described the case of Erich and Otto Hiersekorn, a pair of monozygotic twins, twenty-four-years-old at the time of writing, who were discordant for homosexuality. Lange outlined a litany of physical and psychological differences between the two brothers. Erich was described as heterosexual, intelligent, serious, truthful, masculine, and wholly heterosexual. In contrast, Otto was described as less intelligent than his brother (he had not performed well at school, especially at sums), mischievous, suggestible, fond of “feminine activities”, and—although he had had intercourse with some girls—predominately

¹⁰³ Johannes Lange, *Crime as Destiny: A Study of Criminal Twins*, trans. Charlotte Haldane (London: George Allen & Unwin, [1929] 1931), 143.

¹⁰⁴ *Ibid.*, 143-44.

¹⁰⁵ *Ibid.*, 144.

¹⁰⁶ *Ibid.*

demonstrative of “an invert of the passive type.”¹⁰⁷ Most significantly, Lange described some physical differences between the brothers, stating that the twins “apparently suffered at birth.”¹⁰⁸ Erich had a damaged shoulder while Otto’s right cheek was flaccid and he suffered from a tic of his face (“of organic origin”).¹⁰⁹ Otto was also of lighter build than Erich, had less pubic hair (“its upper border is somewhat of the female type, though not extremely so”), as well as “breasts of definitely feminine appearance”, which Lange contrasted to “the masculine conformation” of Erich’s.¹¹⁰ Lange aligned the twins’ differential sexualities with the birth defects he had described:

Both twins bear the marks of lesions in early childhood, probably received at birth. The heterosexual one has a damaged shoulder, the homosexual one is imperfect on one side of the body, which seems to prove a brain lesion, probably of a deep-seated character. An expert cannot help feeling convinced that there is some connection between this brain lesion and his sexual abnormality.¹¹¹

In the conclusion of the book, Lange vilified the Maat brothers in no uncertain terms, remarking—among other insults—that “[t]he Maats appear to me to belong on the human scrap-heap.”¹¹² Strikingly, in his otherwise adulatory foreword to the English translation of Lange’s book, J. B. S. Haldane criticised Lange’s emotional response to certain cases, including that of the Maat brothers, suggesting that it compromised Lange’s otherwise objective approach.¹¹³ Lange’s study had great longevity; it was, for example, sourced by the controversial German-born British psychologist Hans Eysenck, who used Lange’s twin studies, including the

¹⁰⁷ Ibid., 156, 158.

¹⁰⁸ Ibid., 158.

¹⁰⁹ Ibid.

¹¹⁰ Ibid., 159.

¹¹¹ Ibid., 159-60.

¹¹² Ibid., 189.

¹¹³ Ibid., 16.

case of the Maat twins, in a chapter of his 1964 book *Crime and Personality* entitled “The Mark of Cain”.¹¹⁴

A different study of homosexual twins was published in the Dutch journal *Genetica* in 1934.¹¹⁵ It was conducted by Jacob Sanders, a Jewish physician and Director of the Abteilung für medizinische, statistische Erbllichkeitsforschung (Division for Medical Statistical Heredity Investigations) of the Holländischen Institut für menschliche Erbllichkeitsforschung und Rassenbiologie (Dutch Institute for Human Heredity and Racial Biology), founded in 1933. Sanders sourced female twins from the short-lived Nederlandsch Wetenschappelijk Humanitair Komitee (Dutch Scientific Humanitarian Committee), an offshoot of Hirschfeld’s Institut für Sexualwissenschaft. He reported that five out of six monozygotic (identical) twins were concordant for homosexuality, a result Sanders thought confirmed Hirschfeld’s views on heredity. Sanders’s study was known and cited. In Britain, for example, it was noticed in the *Eugenics Review* in October 1934.¹¹⁶

Although references to German studies that alleged the heredity of homosexuality increased in Britain during the interwar period, British biologists remained remarkably quiet on the matter. This is notable since works on heredity, saturated with eugenic precepts and agendas, proliferated through the era. The emergence of this genre of scientific writing, spanning a broad range from specialist to popular texts, was discussed in chapter two of this thesis. Several of the formative texts continued to be published in new editions after 1918 (for example, new editions of R. C. Punnett’s *Mendelism* continued to be produced well into the 1920s). New

¹¹⁴ H. J. Eysenck, *Crime and Personality* (London: Routledge & Kegan Paul, 1963), 52-53.

¹¹⁵ Jacob Sanders, “Homosexuelle Zwillinge,” *Genetica* 16 (1934): 401-34. See also D. G. Wesselink, “Homosexueele Tweelingen,” *Nederlands Tijdschrift voor Geneeskunde* 78, no. 3 (1934): 3904-5.

¹¹⁶ C. B. S. Hodson, “International Federation of Eugenic Organizations: A Survey of the Zürich Conference,” *Eugenics Review* 26, no. 3 (1934): 217-20, 219.

books by British science writers that featured significant discussion of the genetics of sex determination and sex development include *Heredity and Eugenics* (1923) by Reginald Ruggles Gates, *An Introduction to the Study of Heredity* (1924) by E. W. MacBride, *Evolution, Heredity, and Variation* (1925) by Donald Ward Cutler, *Heredity* (1928) by F. A. E. Crew, *Heredity: Mainly Human* (1934) by Eldon Moore, *Heredity and Evolution* by Arthur Ernest Watkins (1935), *The Study of Heredity* (1938; revised 1950) by E. B. Ford, and *Environment and Heredity* (1940) by Olive Dickinson Maguinness.¹¹⁷ Generally speaking, these texts shared a lot of the same material and approaches, and most concluded with lengthy eugenic polemics. Certain texts ventured to discuss intersexualities and changes of sex but the subject of sexual behaviour was largely circumvented. Possibly British biologists felt the subject was too contentious. Perhaps, for some, it was too close to home (two of the main authorities on the subject of heredity, E. B. Ford and Reginald Ruggles Gates, were themselves queer).

Comparable works by American authorities published in Britain include *Heredity* (1926; 4th ed. 1948) by A. Franklin Shull and *Heredity and Social Problems* (1940) by L. L. Burlingame.¹¹⁸ One of the most popular books of the genre, in Britain and America, was *You and Heredity* (1939) by Amram Scheinfeld. The book was published in Britain by Chatto and Windus, and edited by J. B. S. Haldane.¹¹⁹ Following its popularity, Scheinfeld wrote a number of spin-off works

¹¹⁷ Olive Dickinson Maguinness, *Environment and Heredity* (London: Thomas Nelson and Sons, 1940); E. B. Ford, *The Study of Heredity* (London: Oxford University Press, 1938); Arthur Ernest Watkins, *Heredity and Evolution* (London: John Murray, 1935); Eldon Moore, *Heredity: Mainly Human* (London: Chapman & Hall, 1934); F. A. E. Crew, *Heredity* (London: Ernest Benn, 1928); Donald Ward Cutler, *Evolution, Heredity, and Variation* (London: Christophers, 1925); E. W. MacBride, *An Introduction to the Study of Heredity* (London: Williams and Norgate, 1924); Reginald Ruggles Gates, *Heredity and Eugenics* (London: Constable and Co., 1923).

¹¹⁸ L. L. Burlingame *Heredity and Social Problems* (New York and London: McGraw-Hill Book Company, 1940); A. Franklin Shull, *Heredity* (New York and London: McGraw-Hill Book Company, 1926).

¹¹⁹ Amram Scheinfeld, *You and Heredity*, ed. J. B. S. Haldane (London: Chatto and Windus, 1939).

were published including *Women and Men* (1947), *The New You and Heredity* (1952), *The Human Heredity Handbook* (1961; published in Britain as a Pan paperback titled *The Basic Facts of Human Heredity* from 1963), *Your Heredity and Environment* (1966), and *Heredity in Humans* (1972), firmly establishing Scheinfeld as the leading authority on heredity in Britain and America through the middle decades of the twentieth century.¹²⁰

Curiously, scholarship on Scheinfeld is lacking, although in one respect historians have noticed *You and Heredity*. Before becoming a successful science writer, Scheinfeld had been a cartoonist and *You and Heredity* contains several graphic illustrations which undoubtedly contributed to the book's enormous popularity. One of these, titled "Desirable Traits in Women," is now sometimes reproduced in critiques of twentieth-century biological science. It cautions (men) about the eugenic perils of choosing a wife by looks alone. On the left is what Scheinfeld identifies as a "Socially" desirable blonde woman in evening wear with, among other listed features, "Delicate features," "Slim figure," and "Dainty wrists and hands." On the right is Scheinfeld's eugenically desirable woman, pictured holding a baby, whose listed attributes include "Strong features," "Sturdy figure," and "Broad hips."

Notwithstanding Scheinfeld's stereotyped gender assumptions, his broader schema of the genetics of sex accommodated a wide variety of sex variations, including homosexuality. Having outlined the basics of sex determination in a chapter entitled "'Boy or Girl?'," Scheinfeld included a chapter entitled "The

¹²⁰ Amram Scheinfeld, *Heredity in Humans* (London: Chatto & Windus, 1972); Amram Scheinfeld, *Your Heredity and Environment* (London: Chatto and Windus, 1966); Amram Scheinfeld, *The Basic Facts of Human Heredity* (London: Pan Books, 1963); Amram Scheinfeld, *The New You and Heredity* (London: Chatto and Windus, 1952); Amram Scheinfeld, *Women and Men* (London: Chatto and Windus, 1947).

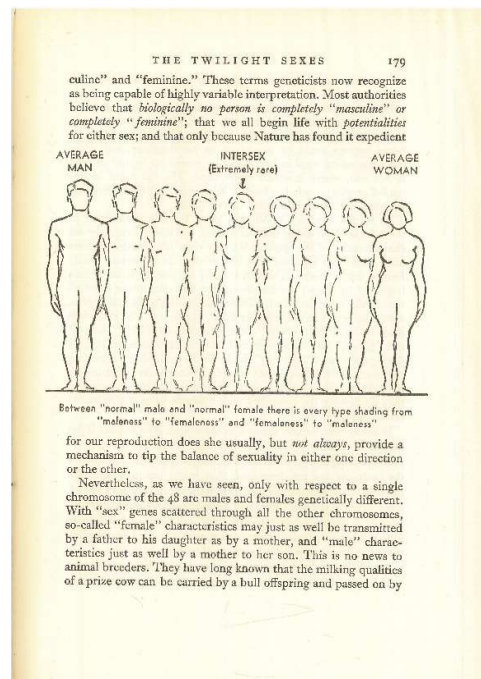
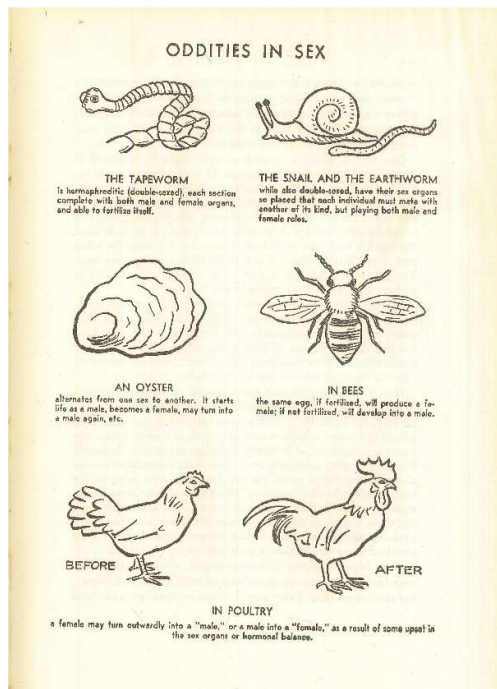
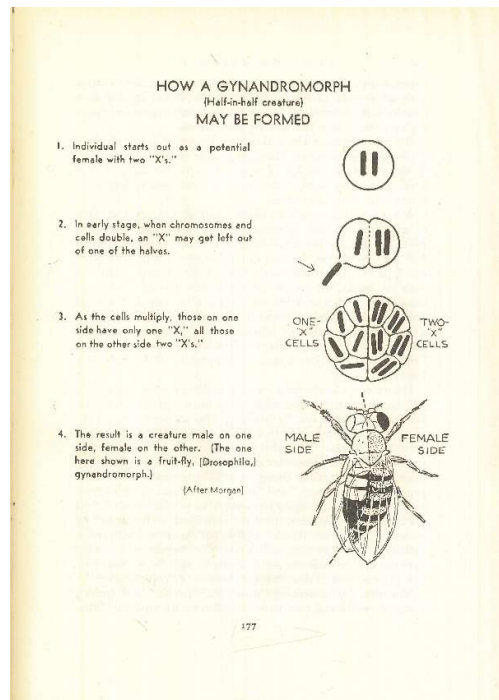
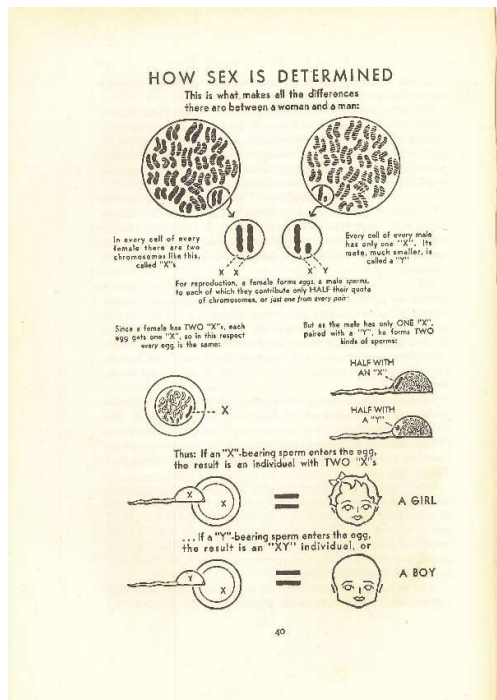


Fig. 10. Images from *You and Heredity* (1939) by Amram Scheinfeld:
(i) "How Sex is Determined (top left); (ii) "How a Gynandromorph May Be Formed (top right); (iii) "Oddities in Sex" (bottom left); "The Twilight Sexes" (bottom right).

Twilight Sexes”, in which he discussed gynandromorphs, human intersexualities, as well as male femininities and female masculinities (Fig. 10):

The Bible says, “Male and female created he them. . . .” There is no need to dispute that. But however distinctly the first man and woman might have been differentiated the one from the other, in the billions that are assumed to have sprung from them one can find every gradation of sexuality. In short, sex is a highly variable characteristic, and there is not quite the clear-cut distinction between “male” and “female” which we’ve always assumed that there was.¹²¹

Scheinfeld’s lengthy and remarkably broad-ranging narratives about the genetics of sex are indicative of the onset of a more inclusive attitude in texts about heredity, and—in Anglo-American science writing more generally—of a changing attitude that would find its greatest expression in the two major sexological works, *Sexual Behavior in the Human Male* (1948) and *Sexual Behaviour in the Human Female* (1953) by the American zoologist Alfred Kinsey and his collaborators.

Scheinfeld’s *You and Heredity* can therefore usefully be understood as a transitory text, exhibiting various contradictions and multiple perspectives. The book, and its offshoots, are paradigmatic of “reform” eugenics, that attempted to work to repudiate an extremist biological determinism which is most often associated with Nazi Germany but which—as this section has already shown—was gaining credence elsewhere, including Britain. Scheinfeld’s multi-layered rhetorical strategy, part of his attempt to forge new conceptual pathways through existing studies of heredity, is deserving of greater elucidation than can be undertaken here. For present purposes, it is useful to look at Scheinfeld’s appraisal of homosexuality, the lengthiest in the mid-twentieth-century literature on heredity, which appears in a chapter on sexual behaviour.

¹²¹ Amram Scheinfeld, *You and Heredity*, ed. J. B. S. Haldane (London: Chatto and Windus, 1939), 173.

Among other sources, Scheinfeld referred to the German literature on familial studies (conducted by Hirschfeld, von Römer, and Wolf) as well as Jacob Sanders's study on homosexuality in twins. Scheinfeld, however, sought to downplay an overly rigid interpretation of such studies:

“Direct” inheritance of homosexuality hardly seems possible. What is usually implied is the inheritance of a *tendency* toward homosexuality which depends for its expression on certain environmental or psychological factors. Among both men and women, for instance, the lack of available members of the opposite sex, or for one reason or another any acquired aversion to relations with members of the opposite sex, would favour the expression of such a tendency.¹²²

Scheinfeld discussed the possibility of medical treatment for homosexuality, suggesting that, should an endocrine or glandular aetiology be proven, then an operation or hormone treatments might be developed. Again, however, having outlined a position that assumed a pathological interpretation, Scheinfeld immediately moved—with no small amount of rhetorical flourish—to suggest the viability of a different position:

All this is predicated on the assumption that homosexuality should be cured and eliminated, an assumption well justified by the fact that in our present society this condition seriously militates against an individual's adjustment and happiness. We need hardly enlarge on this phase of the subject. But at the same time, if it should be proved that this form of sexual behaviour is a *natural* one with many individuals—that they have either inherited the tendency or acquired it without any volition—and that nothing can be done—or possibly even should be done—about it, the question arises as to whether the attitude of society should not be changed. Viewed from any standpoint, the subject calls for more sympathy and understanding than is now being given it by the public and by the law. In the light of what little we already know, the hounding of homosexuals as criminals, classifying them with degenerates, drug-fiends and insane, exhibiting them on the stage as freaks and subjecting them to scorn, ridicule and ostracism, seems hardly in keeping with a supposedly enlightened age.¹²³

¹²² Ibid., 319. Scheinfeld's italics.

¹²³ Ibid., 323-24. Scheinfeld's italics.

Scheinfeld is undoubtedly strategic by his contemplation without commitment to the view that society needs to better accommodate homosexuality. Nonetheless, it remains one of the boldest expressions of this notion in the first half of the twentieth century. His remarks are a pertinent way to conclude this chapter. They are perhaps a reminder of Élie Metchnikoff's remark, written in the first years of the twentieth century, that sexual "disharmonies" such as masturbation and homosexuality were "natural enough". Scheinfeld's comments more fully express what had been implicit—and occasionally explicit—in medico-scientific appraisals of homosexuality, and sex variations more generally: that the new biologies of sex that emerged around 1900 had, from the outset, provided means for reconceptualising as normal and natural all manner of sex-related phenomena that had previously been considered unnatural or immoral.

A key trope of this thesis has been to demonstrate that the prevalence of eugenics—and a broader eugenic mentality based on the desire to control humanity's biological destiny—worked, albeit often in subtle ways, to mitigate assertions of the naturalness of sex variations. Eugenics influenced harsher responses and medical interventions aimed at manipulating biological variables (hormones and genes) that were believed to produce sex variant bodies, minds, and behaviours. As eugenic precepts were increasingly called into question, new ways of naturalising and normalising sex variations became possible. Scheinfeld, still a committed eugenicist, outlines the hard-line view of homosexuality, including the possibility of its eradication, but then works to undermine this view as he reaches for a more inclusive position. It is also of note that he made this move in a book written for a popular readership, providing a final example of the ability of popular platforms to facilitate changing medico-scientific ideas. If his strategy now appears half-hearted, it is at

least an interesting snapshot of a transition in medico-scientific attitudes that would continue to play out through the tumultuous 1940s and beyond.

Conclusion

This thesis has expanded the historiographical territory relating to the emergence and development of sexology in Britain from around 1900, and the discovery of Y and X chromosomes and “sex” hormones, to 1939. Historians of the period had previously discussed the lingering presence of the late-Victorian sexological tradition—chiefly associated with Havelock Ellis in British contexts—as well the emergence and development of influential medical categories of sexualities derived from psychiatry and psychoanalysis. By comprehensively considering the importance of biologists and the biological sciences in producing new, modernist concepts, rhetoric, and practices relating to sex variations, I have aimed to produce a broader and more multifaceted picture of the complex sexological landscape and creation of sexual knowledge in early-twentieth-century Britain.

By opening up such a sizeable and influential arena of sexological endeavour, this thesis has made three original contributions to science historiography, each creating further pathways for continued research. Firstly, it has shown that from their earliest elucidation, the new genetics and endocrinology of sex were amenable to competing models and interpretations of sex variations. Tensions between narratives of pathologisation and naturalisation relating to queer bodies, minds, and sexualities had not previously received concerted attention in science historiography, which had primarily focussed on how the first modern geneticists and endocrinologists often conceptualised “sex” chromosomes and internal secretions in highly gendered, dualistic terms. Building on suggestive work by Lisa Carstens and Anne Fausto-Sterling, this thesis has produced a more nuanced picture of the early development of the new sexological biology that emerged from around 1900. It has found that the

variations of sex, including intersexualities, transformations of sex, and non-reproductive sexual behaviours in human and non-human animals alike were pivotal to the new breed of sex physiologists—often the only means of studying intricate and often hidden physiological processes pertaining to sex determination, sex development, and sexualities. Long-standing theological, legal, and social strictures against sex variant bodies, minds, and behaviours meant that biologists approached sex variations in a profoundly queerphobic scientific environment. Additionally, chromosomes and internal secretions have been closely associated with prevailing notions of evolution and nature, more so than sexological precepts associated with psychiatry and psychoanalysis, and could thereby be readily considered as potentially naturalising and normalising all manner of sex variations

The first two chapters of the thesis demonstrated that sex variations, and prevailing notions of the primordial intersexuality of all higher animals (including humans), were integral to the emerging scientific disciplines of genetics and endocrinology. As British and American biologists such as William Ernest Castle, Walter Heape, and F. H. A. Marshall—the early pioneers of so-called “reproductive” physiology—sought to explain all manner of sex-related phenomena by recourse to chromosomes and internal secretions, they leaned heavily on prevailing concepts and rhetoric relating to sex. In this endeavour they drew on Charles Darwin and Darwinian biologists such as Ernst Haeckel. They also drew on leading sexological writings, especially Peter Chalmers Mitchell’s 1906 English translation of Otto Weininger’s *Sex and Character*. Such works allowed biologists to contextualise what remained for a long time puzzling biological phenomena but also brought the new biologies of sex into ever closer juxtaposition with contentious sexological authors

and texts. In turn, certain sexological writers including Ellis and Solomon Herbert adapted their texts to accommodate the new biology, especially endocrinology.

Steadily, the new sexological biology outgrew its early flirtation with the sexologists. Chapters three and four of this thesis surveyed how the new biology of sex flourished in interwar Britain. Chapter three recovered a significant body of Julian Huxley's early writings concerning the biology of sex determination, sex development, and sexual behaviour. Following the success of his studies relating to avian courtship, Huxley envisaged a more integrated approach to the study of animal behaviour, which would synthesise the perspectives of both field observations and experimental zoology. In this endeavour he considered sex-related questions the most pressing, although in practice he failed to assimilate his own ornithological observations of avian courtship with the new biology of sex determination which was developing at a rapid pace in Germany and the United States.

Huxley learned the latest theories of sex determination directly from Richard Goldschmidt and Thomas Hunt Morgan, largely siding with Goldschmidt's controversial (and ill-fated) "theory of balance" which catered for a high degree of sexual variations both in morphology and behaviour. Especially during his period as fellow of New College and senior demonstrator in the Department of Zoology and Comparative Anatomy at Oxford (1919-1925), the biology of sex constituted one of Huxley's leading interests and played a major role in establishing him as one of the twentieth century's most famous public intellectuals and popularisers of science. The chapter also examined the sexological research of F. A. E. Crew who, as the first director of the Animal Breeding Research Department (ABRD), established Edinburgh as a leading centre of sexological research, at least until the late-1920s when the Sex Physiology section of the ABRD had to be wound down for financial

reasons. Between them Crew and Huxley perpetuated Goldschmidt's theory of sex reversal in multiple contexts, arguing fervently that a complete range of sex intergrades—of which homosexuality was a mild form—and the possibility of complete sex change, existed naturally and normally across the animal kingdom, including among humans.

The advent of eugenics and associated ideologies and practices (such as sex selection) complicated the situation enormously, allowing certain biologists and their interlocutors to conceptualise sex variations as natural but to nonetheless advocate proscriptive practices aimed at their eradication. The thesis has paid close attention to the complex, often nebulous ways in which eugenicists considered queer bodies, minds, and sexualities. Ostensibly, British biologists rarely mentioned sex variations in the eugenic invectives which saturate the scientific literature of the early twentieth century. However, a close reading of certain texts, provided in chapter two, has shown that references to “sexual vice,” and other vague but suggestive rhetoric made by biologists such as William Bateson and J. Arthur Thomson, implicated non-heteronormative sexual behaviours with their eugenics by default. An analysis of Geoffrey Smith's address to the Eugenics Education Society, published in the *Eugenics Review* in April 1914 under the title “A Contribution to the Biology of Sex,” showed more clearly how the muted rhetoric and overstated apologetics of Edwardian biologists implicated the so-called “disharmonies” of sex within eugenic agendas.

Chapters three and four showed how these complex and shadowy dynamics played out more explicitly in the sexological writings of Julian Huxley. In his highly publicised address to the Royal Society of Arts on January 18, 1922, Huxley argued, still somewhat vaguely that, sex variations, including homosexuality, were natural

(“[i]t is important to note that a complete transition exists in man from very slight degrees of intersexuality, where only the sexual instincts seem to be affected”) yet he immediately suggested that such knowledge could lead to their eradication (“there is a distinct theoretical possibility that cases of sexual perversion might be cured by injection or grafting of the proper reproductive organ”). His sharply double-edged analysis was subsequently echoed by Leonard Williams in the pages of the *British Medical Journal*. Such biological theorising provided fertile intellectual ground for the influx of texts by Nazi geneticists, psychiatrists, and eugenicists in interwar Britain, discussed in chapter four, which contained even more pernicious assessments of queer bodies, minds, and sexualities.

Eugenic notions and rhetoric relating to queer people became established in interwar Britain in very haphazard ways. Their explanatory power, which became especially extensive during the homosexuality debates of the post-1945 era, held political and rhetorical weight, and highly invasive medical interventions geared towards “curing” homosexuality were prevalent in Britain at least from the early 1930s when Kenneth Walker—in collaboration with F. A. E. Crew and others—castrated a homosexual man with the express purpose of curtailing his homosexual desires (described for the first time in scholarship in chapter four).

Charting and scrutinising the development of these scrappy discourses is, however, important. The pursuit of eugenics and the concomitant development of genetic psychiatry in Britain are subjects of increasing interest to historians.¹ Hitherto, however, the subject of queer bodies and sexualities has been little discussed in this scholarship. Similarly, queer aspects of the history of eugenics in

¹ See, for example, Patrick T. Merricks, *Religion and Racial Progress in Twentieth-Century Britain: Bishop Barnes of Birmingham* (Cham: Palgrave Macmillan, 2017); Weindling, “Julian Huxley and the Continuity of Eugenics.”

Britain have been little mentioned in the broader debates that have, relatively recently, surrounded the issue of eugenic legacies in modern British academia and beyond. As this thesis was being researched, authorities at University College London (UCL) commissioned (in December 2018), investigated, and published a major report on the history of eugenics at UCL, which made a number of recommendations for improved practice.² Strikingly, ten members of the Inquiry, the MORE subgroup, felt that the report did not go far enough and produced a separate document with further recommendations.³ While the efforts of academics and staff at UCL are to be applauded, both documents evidence the prevalence of a too limited view of eugenics and its impact. While repeatedly identifying race and disability as having been impacted by eugenics, neither document makes any specific reference to how queer people were victimised by eugenicists (including queer eugenicists).

Another widely reported event that happened as this thesis was being written was the publication of a damning article that highlighted the scientific and ethical failings of one of the most famous and controversial figures in twentieth-century psychiatry, the German-born British psychologist Hans Eysenck.⁴ Again, however, Eysenck's influential assessments of queer sexualities, including his endorsement of invasive psychiatric treatments for queer people, were not mentioned. It was briefly mentioned in chapter four that Eysenck made use of a case description of homosexual twins, the Maat brothers, pulled from the 1931 English translation of Johannes Lange's *Crime as Destiny: A Study of Criminal Twins*. A more

² UCL Inquiry into the History of Eugenics, *Inquiry into the History of Eugenics at UCL – Final Report* (2020),

https://www.ucl.ac.uk/provost/sites/provost/files/ucl_history_of_eugenics_inquiry_report.pdf.

³ MORE Subgroup of Members on the Commission of Inquiry into the History of Eugenics at UCL, *Investigation into the History of Eugenics at UCL* (2020),

<https://www.ucl.ac.uk/provost/sites/provost/files/recommendations-ucl-eugenics-inquiry-more-group-university-college-london-february-2020.pdf>.

⁴ Anthony J. Pelosi, "Personality and Fatal Diseases: Revisiting a Scientific Scandal," *Journal of Health Psychology* 24, no. 4 (2019): 421-39.

comprehensive investigation of Eysenck's hugely influential writings will undoubtedly show that their failings, which are only now being publicly debated, fully extend to his derogatory treatment of queer people.⁵

Biology displaced "literary" sexology, most associated with Havelock Ellis in British contexts, as an arbiter of sexual knowledge and as the main alternative to psychological concepts of sexualities, not just in elite professional medico-scientific circles but more popularly. The second major innovation that this thesis has made to science historiography has been to examine the dynamic relationships between specialist, semi-popular (especially intellectual journals), and popular sexological texts derived from the newly emerging biological sciences. The thesis has surveyed a wide variety of texts. Two genres stand out as being relatively innovative in science historiography but were especially significant for the development of the sexuality debates that steadily emerged as the development of sexological biology began to impact on a broad cultural canvass in modern Britain.

The first of these is correspondence pages in leading professional and intellectual journals such as the *British Medical Journal* and the *Lancet*. They are invaluable for identifying key issues that were important to pertinent individuals at certain points in time. Moreover, correspondents often communicate in a more informal, candid, often belligerent authorial voice than they do in more specialist medico-scientific articles, thereby providing historians with unique behind-the-scenes insights into significant debates of the day. Letters pages also give voice to a wide variety of actors, sometimes including individuals who seemingly have little to do with the subject in hand. Most strikingly, however, published correspondence

⁵ Eysenck was in fact an early target of the early gay rights movement in Britain. See, for example, Peter Tatchell, "Aversion Therapy is 'Like A Visit To The Dentist'," [1972], https://www.petertatchell.net/lgbt_rights/psychiatry/dentist/.

provides evidence of how key concepts and rhetoric, otherwise considered separately in scholarly writing, were brought into juxtaposition with each other. With specific regard to the homosexuality debates that emerged in Britain through the interwar era, it is evident that correspondence pages provided a hugely important impetus for these debates, generating a momentum both for radical agendas, including law reform, and concerted opposition to such ideas.

The thesis has also expanded scholarship on science popularisation by charting the reporting of biologists' sex studies in Britain's newspapers. Alison Oram and Clare R. Tebbutt had, separately, previously explored the emergence and development of the "gender crossing" (Oram)/"sex change" (Tebbutt) story through the 1930s. This thesis has found that the reporting of sexological stories was significantly more extensive, identifying a variety of events and stories that were popularly disseminated, often in a sensationalised manner, in Britain's national and local newspapers and sometimes internationally. The degree to which this happened has been surprising. Even highly specialist studies, such as Geoffrey Smith's research on the parasitic castration of *Rhizocephala*, were afforded press attention as new ways of conceptualising the origins of sex in the light of Mendelian inheritance, "sex" chromosomes, and hormones received considerable space in Britain's newspapers. The first chapter of the thesis showed how the attention of the popular press came to focus on new scientific theories of sex determination early in 1898. The second chapter explored the first reporting of Mendelian and genetic theories of sex and the beginnings of newspaper reporting of biologists' studies of sex variations in birds around 1913/14, a significant innovation in reporting stories related to the science of sex. The third chapter discussed the rapid proliferation of popular news reports concerning sex variations in non-human animal subjects from 1921, largely

attributable to the popularisation endeavours of F. A. E. Crew and Julian Huxley and which forms an important precursor to the later reporting of human “sex change”/“gender crossing” stories through the 1930s discussed by Tebbutt and Oram.

Adopting an integrated approach, paying close attention to the complex dynamics of, and between, different genres of sexological writing, the thesis has shown that science communicators often used semi-popular and popular platforms to achieve ends that were not attainable in specialist texts. This is especially the case for eugenics and related subjects such as sex selection. This thesis therefore presents a new model of popular science, the *adaptationist model*, in order to better conceptualise the myriad ways in which sexological ideas, rhetoric, and practices were changed—developed, censored, politicised, criticised, gendered, eugenicised, translated, racialised, personalised, distorted, ridiculed, sensationalised, medicalised, appended, edited, queered, normalised, simplified—as they moved between different actors and texts.

The thesis has provided several examples of sexological concepts mutating as they were propagated across diverse genres of science writing. The second chapter discussed an article that appeared in *The Times* on July 2, 1914 (“Transformation of Sex: Hen Pheasants in the Plumage of Cocks: Specimens from Sandringham”) in which Arthur Keith’s exhibit of the king’s sex-transformative pheasants was utilised to promote the sexological endeavours of British biologists precisely at the moment when the primary locus of the new “reproductive” physiology was shifting from Britain to the United States. Patriotic posturing, and the promotion of scientific modernity as an ideal of British biologists, is discernible in other popular and semi-popular texts discussed in this thesis.

The second chapter also discussed an article titled “Intermediate Sexual Types” that appeared in *New Freewoman* (October 1, 1913) in which the naturalist and humanitarian E. Bertram Lloyd looked to Magnus Hirschfeld’s contributions to the seventeenth meeting of the International Congress of Medicine in London in order to criticise the law relating to gay sex and urge its reform. Arguments for homosexual law reform founded on arguments derived from genetics and endocrinology have been identified elsewhere in the thesis, these invariably appearing in popular texts, such as Kenneth Walker’s sexological books, and in semi-popular platforms, such as the *British Medical Journal* where Leonard Williams urged law reform in response to a lecture given by Julian Huxley.

The third chapter discussed in detail how Huxley, and F. A. E. Crew used Britain’s national and local newspapers to promote sexological biology in particular ways which also allowed them to promote themselves as leading British scientists and their eugenic agendas. Even more so than the three preceding chapters, the fourth chapter demonstrated how the popularisation of sexological precepts assumed its own transformative momentum and dynamics, charting how genetic and endocrinological concepts of homosexuality were adapted to different ends across a variety of popular and semi-popular texts in interwar Britain with little credible grounding in academic science at all.

Greater recognition and understanding of the popularisation of biologists’ studies of sex through the early twentieth century also helps explain how and why biologists’ models of sex differences and sexual behaviours—especially intersexualities, transformations of sex, and non-heteronormative sexual behaviours—rapidly superseded those derived from sex reformers such as Edward Carpenter and Havelock Ellis and which never achieved the level of popular

dissemination afforded to the sexological activities of elite scientists such as Crew and Huxley. The newspaper reporting of sexological stories requires further, concerted attention. Focussed as it has been on biology, and on biologists and their influence, this thesis has not aimed for a comprehensive survey of sexological reporting. However, the research conducted for this thesis yielded other examples, especially relating to psychoanalysis, that could potentially contribute to such a survey (for example, on December 4, 1920 the *Daily Mail* ran a story headlined “Sex Side of New ‘Science’: A Psycho-Analysis Danger” suggesting that newspapers might provide a rich new area of inquiry for studies on the dissemination of psychanalysis in Britain).⁶

This thesis has not examined how shifting concepts and practices relating to sexualities derived from the biological sciences were echoed in literary and artistic contexts in the way that Havelock Ellis’s sexological studies are known to have been (not least in the writings of Radclyffe Hall). There is some indication that they were. In an enlightening article, Catriona Livingstone has highlighted various published and unpublished writings by Virginia Woolf, most notably her 1938 book *Three Guineas* and posthumously-published 1941 novel *Between the Acts*, which show the influence of Julian Huxley’s popular sexological texts including *The Science of Life* and *Essays in Popular Science*, not least his narratives of the mutability of sex characteristics.⁷ Greater awareness of the prominence of sexological biology in early- and mid-twentieth-century Britain may cast further light on other literary and artistic creations of the period.

⁶ “Sex Side of New ‘Science’: A Psycho-Analysis Danger,” *Daily Mail*, December 4, 1920, 8.

⁷ Catriona Livingstone, “‘How Can We Alter the Crest and the Spur of the Fighting Cock?’: Julian Huxley, Popular Biology, and the Feminist Pacifism of Virginia Woolf,” *Women: A Cultural Review* 31, no. 3 (2020): 315-34.

The thesis' third main contribution to science historiography concerns the importance of sexualities and sexual prejudices in the lives of scientists to their science and the production of sexological knowledge. This has evolved from Luis Campos's pioneering, intriguing 2010 study of Hugo de Vries and other queer geneticists, outlined in the introduction. This thesis would undoubtedly have paid more attention to the issue had further primary sources relating to the private lives of its main protagonists come to light, but this has not been the case which itself highlights a problem with attempts to use sexuality as a methodological tool in science historiography. It is unfortunate that not all biologists' closeted archives are as fruitful as de Vries's, queerly or otherwise. Notwithstanding, Julian Huxley has provided one interesting case, but in seeking to pursue a methodological approach akin to Campos's for Huxley, the thesis, or at least chapter three, has necessarily complicated Campos's approach. Frank remarks in Huxley's memoir about his "unresolved conflicts about sex", and my discovery of some delightful archived homoerotic poems and doodles, dating from his Eton schooldays, have only added to the already established view that his emotional and sexual life were complex—a situation that can readily be extended to many other scientists, at least in principle, as much as it can to any other group of people. In this endeavour, Huxley has, therefore, proven useful to the endeavour of developing Campos's study. By setting Huxley's eclectic sexological writings alongside that which is known about his conflicted sex life, a strong concordance is discernible. Huxley's sex-related studies were highly conflicted, a situation that is especially apparent in his inability to rectify his field studies of avian courtship and mating with the laboratory studies of sex determination and sex development.

Although the issue of sources remains acute, Campos's queer methodological approach to science historiography deserves further development. Greater, queerer attention to archival sources will hopefully yield more pertinent material. In some cases, existing biographical scholarship can also be brought to bear on the matter. For example, the pioneering English ecologist G. Evelyn Hutchinson showed great interest in the subject of homosexuality (although he was English, Hutchinson spent most of his professional life at Yale University). Writing in *American Scientist* in 1957, and again in 1959, he proffered an innovative genetic explanation of non-reproductive sexual behaviours founded on the principle of balanced polymorphism, suggesting in his first paper on the subject that "[i]t is [...] quite possible that rather obscure aspects of the phenomenon of choice of a mate may be slowly operating and have evolutionary significance."⁸

In common with Julian Huxley, Hutchinson's enduring interest in the subject of homosexuality, and his willingness to discuss it so openly when so many of his contemporaries would not, may have been rooted in his early personal experiences. As an adult Hutchinson was married three times but as youths both he and his younger brother Leslie Hutchinson attended Gresham's School, a public school in Holt in Norfolk. Candid reminiscences by their sister Dorothea Hutchinson, reproduced in Nancy G. Slack's 2010 biography of Evelyn Hutchinson, describe how the potential for sexual relations between boys was explicitly prohibited at Gresham, a situation that undoubtedly worked to maintain the possibility of such relations at the forefront of the daily experiences and mentalities of many of the boys and masters. She stated that Evelyn thought that both the headmaster and housemaster

⁸ G. Evelyn Hutchinson, "Marginalia," *American Scientist* 45, no. 1 (1957): 88-96, 95. See also G. Evelyn Hutchinson, "A Speculative Consideration of Certain Possible Forms of Sexual Selection in Man," *American Naturalist* 93, no. 869 (1959): 81-91; Alex Comfort, "Sexual Selection in Man – A Comment," *American Naturalist* 93, no. 873 (1959): 389-91.

“had homosexual tendencies”.⁹ She further commented that Leslie was quite unaware of the situation, adding suggestively that, in contrast, “I think Evelyn was a bit too aware.”¹⁰

As Evelyn Hutchinson’s innovative appraisal of the sexuality debates of the postwar era perhaps suggests, 1939 and the beginning of the Second World War is a relatively good place to conclude this thesis, although the core lessons it contains will prove invaluable for a further study of the postwar period. Aside from the emergence of new, post-modern synthesis evolutionary models of homosexuality, the post-1945 era saw the rapid proliferation of debates about homosexuality which culminated in the momentous 1957 Report of the Home Office’s Departmental Committee on Homosexual Offences and Prostitution, commonly known as the Wolfenden Report after the Committee’s chairperson John Wolfenden.

The Wolfenden Report is an extraordinary document, often referred to as a landmark in British post-1945 social, legal, and sexual history but little read. It is well known that the Report recommended the partial legalisation of male homosexual acts in private as well as the establishing of an age of consent for males in law as already existed for females, recommendations that were eventually enacted in England and Wales by the Sexual Offences Act 1967. Less well known is that the Report explicitly rejected the notion that homosexuality was, in and of itself, a disease. This conclusion is surprising given that (1) the Committee was conceived amid repeated calls from diverse authorities to provide homosexuals with medical treatment; (2) the Report, focussed as it was on considering the legal status of homosexual acts and the treatment of individuals convicted of such acts,

⁹ Nancy G. Slack, *G. Evelyn Hutchinson and the Invention of Modern Ecology* (New Haven: Yale University Press, 2010), 31.

¹⁰ Ibid.

acknowledged that it was not within its remit to deliberate on the nature or aetiology of homosexuality; and (3) the vigour with which certain psychiatrists and other medical experts tried to convince Wolfenden and his Committee that homosexuality was a serious pathological condition. The Report, however, was categorical in rejecting the notion, asserting that “[w]e do not consider ourselves qualified to pronounce on controversial and scientific problems of this kind, but we feel bound to say that the evidence put before us has not established to our satisfaction the proposition that homosexuality is a disease.”¹¹

Some insight into the Report’s position can perhaps be gleaned from certain of the many expert testimonials submitted to Wolfenden’s Committee during its lengthy deliberations, an edited collection of which is presented in Brian Lewis’s *Wolfenden’s Witnesses: Homosexuality in Postwar Britain*.¹² Many of these—well over a third in fact—were written by professionals from diverse medical backgrounds and promulgate various pathological models of homosexuality, largely derived from psychiatry and psychoanalysis, and a number of supposed therapies, that were prevalent in Britain through the middle decades of the twentieth century. A small number of testimonials submitted by leading biologists of the era are very different in content and tone. They include a transcript of an interview with the prominent American biologist Alfred Kinsey, professor of zoology at Indiana University and at the height of his considerable fame at the time of the interview following the publication of his influential studies *Sexual Behavior in the Human Male* (1948) and *Sexual Behavior in the Human Female* (1953), together known as the Kinsey Report. Others were written by leading British zoologists and

¹¹ Home Office / Scottish Home Department, *Report of the Committee on Homosexual Offences and Prostitution* (London: Her Majesty’s Stationery Office, 1957), 15.

¹² Brian Lewis, *Wolfenden’s Witnesses: Homosexuality in Postwar Britain* (Basingstoke: Palgrave Macmillan, 2016).

evolutionary biologists. These include a memorandum submitted by the Institute of Biology (est. 1950, now Royal Society of Biology) and another co-signed by three of Britain's most eminent biologists, C. D. Darlington, Ronald Fisher, and Julian Huxley. These memoranda make unprecedented arguments for the naturalisation and legalisation of homosexual acts drawn from genetics, endocrinology, ethology, and anthropology and go a long way towards explaining the position adopted by the Wolfenden Committee on the nature of homosexuality. Their significance can only be truly appreciated against the backdrop provided by the present thesis.

Highlighting another important development in postwar Britain, Chris Waters has examined the growing professional and public interest in the social world of the homosexual through the period, a significant shift from the earlier focus on case studies of the "atomized and anatomized", usually pathologised, individual homosexual, whose alleged biological, psychological, and familial shortcomings had occupied medical works for almost a century.¹³ For the first time, certain British physicians, psychiatrists, sexologists, sociologists, and social commentators recognised homosexuals as a social entity or "problem," amenable to social scientific analysis, social solutions, and elite (or establishment) social control. Waters situates this important change squarely in the rapid expansion of the human sciences which, despite being established much earlier in the century and notwithstanding some formative landmark works of social investigation, had largely failed to assert themselves as a formidable and visible methodological force in academic and popular contexts prior to the Second World War. Only with the symbiotic development of the postwar welfare state and the more formal pursuit of social scientific investigation, Waters argues, did the social world of the male homosexual

¹³ Chris Waters, "The Homosexual as a Social Being in Britain, 1945-1968," *Journal of British Studies* 51, no. 3 (2012): 685-710, 686.

emerge as a visible object of scrutiny alongside other social “problems” such as demographic decline, family breakdown, racism and anti-Semitism, and juvenile delinquency.

Unarguably, the expanding influence of the human sciences is important in promulgating a “social turn” in assessments of homosexuals and homosexuality in postwar Britain, but the lessons from this thesis suggest that they might not necessarily constitute the whole story. The new breed of social psychologists, sociologists, and their interlocutors (including certain physicians, psychiatrists, and social commentators) did not, and still do not, hold a monopoly on the scientific study of the social realm—of homosexuals or indeed anyone else—nor its popular understanding. The postwar period also saw the rapid development and continued popularisation of the biological sciences which had long sought to describe the complex social and sexual worlds both of humans and non-human species, as they were perceived by observing biologists at the time, in evolutionary and other biological frameworks. For example, Kenneth Walker—discussed in chapter four of this thesis—maintained a prominent presence in the fraught homosexuality debates of the postwar era, making some striking appraisals of the “social problem” of homosexuals. He broached the subject in a chapter on “Sexual Deviations” in his popular book *The Physiology of Sex and Its Social Implications* (1940; 2nd ed. 1954), asserting that “[s]exual inversion provides a social problem of the first magnitude, because of its tendency to occur in members of the community who are above the average in intellect and character.”¹⁴

Walker’s commentary demonstrates that a new awareness of social aspects of homosexuality, albeit often construed collectively as a “social problem,” did not

¹⁴ Kenneth M. Walker, *The Physiology of Sex and Its Social Implications* (Harmondsworth: Allen Lane, 1940), 133.

preclude biological, psychiatric, and other approaches. Walker adopted a composite approach, drawing on a variety of sources, including Havelock Ellis, in an attempt to present a multidimensional view of the homosexual “problem,” but without necessarily seeking to assimilate the disparate positions he presented. Walker maintained, as he always had, that homosexuality was “a highly abnormal form of sexuality” (“since it entirely excludes the primary end for which sex exists”), but now worked to establish its prevalence in the animal kingdom, among indigenous cultures (“uncivilized peoples”), and in ancient civilisations.¹⁵ Of the former, he wrote: “Like masturbation, homosexual practices are prevalent not only amongst human beings, but also throughout the animal kingdom.”¹⁶ Supporting this claim, he quoted from the American behavioural scientist G. V. Hamilton’s study of monkeys and baboons: “the immature male monkey typically passes through a period during which he is overtly and exclusively homosexual ... this period is terminated at sexual maturity by an abrupt turning to heterosexuality”.¹⁷

Elsewhere in his narrative Walker cautioned against homosexuals marrying (women) on eugenic grounds, claiming, without referencing any sources, that “[i]t is almost certain that there is a strong hereditary factor in inversion, and for this reason procreation is undesirable”, but he made no attempt to align this view with his reference to homosexual behaviour in monkeys and baboons. He also called explicitly for law reform, writing that “[o]n no grounds whatever can the retention of the ancient ecclesiastical enactment against homosexuality be justified.” He added: “It is as silly as it is cruel.”¹⁸ His analysis was extended in a companion book to *The Physiology of Sex and Its Social Implications* titled *Sex and Society* (1955), co-

¹⁵ Ibid., 128.

¹⁶ Ibid.

¹⁷ Ibid.

¹⁸ Ibid., 134-35.

authored with the English psychologist Peter Fletcher (pseud. Alfred Brinson Woods Fletcher), which assimilated key tenets from the Kinsey Report which, as Donna J. Drucker has usefully shown, was itself grounded in the conventions of mid-twentieth-century zoology.¹⁹

There clearly remains much more to learn about the pursuit of “queer science” in twentieth-century Britain, and elsewhere, but Walker’s multifaceted approach to sexualities—a complex amalgam of sexology, zoology, sociology, eugenics, and science popularisation—suggests that the biological sciences played significant roles in the homosexuality debates that raged so intensely at all levels of society in postwar Britain. A rigorous historiographical approach that is both expansive and integrated is required in analysing those debates. In demonstrating that sexological narratives of naturalisation and pathologisation are interrelated, by presenting a new, dynamic model of science popularisation, and by stressing the importance of sexualities as an important vector of analysis in historiography, this thesis has provided a solid foundation for just such a project.

¹⁹ Kenneth M. Walker and Peter Fletcher, *Sex and Society* (Harmondsworth: Penguin Books, 1955), ch. 11; Donna J. Drucker, *The Classification of Sex: Alfred Kinsey and the Organization of Knowledge* (Pittsburgh: University of Pittsburgh Press, 2014).

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