



Nick Hopwood, Rebecca Flemming, Lauren Kassell, eds. *Reproduction: Antiquity to the Present Day*. Cambridge: Cambridge University Press, 2018. Illustrations. xxxv + 730 pp. \$125.00, cloth, ISBN 978-1-107-06802-5.

Reviewed by Marion Thomas (Université de Strasbourg, Faculté de médecine)

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Commissioned by Dominic J. Berry (London School of Economics and Political Science)

Reproduction: Antiquity to the Present Day is the outcome of a five-year Wellcome-funded project titled “From Generation to Reproduction,” which aimed at providing a long-term perspective on the history of reproduction from antiquity to the twenty-first century. This project was led by three Cambridge scholars who are the co-editors of the present book: Nick Hopwood and Lauren Kasell, professors of history of science and medicine, and Rebecca Flemming, senior lecturer in classics (ancient history).

Nearly seventy contributors, of international standing, participated in the writing of forty-four chapters that give insights into the ways people understood, tried to intervene in, thought about, and acted on human reproduction from antiquity to the present. They cover selected geographical regions, primarily the Mediterranean, Western Europe, North America, and their empires. Besides these chapters, forty “exhibits” present striking pictures of artifacts, paintings, engravings, vases, sculptures, newspaper covers, and cartoons, ranging from a photograph of an ancient Egyptian fertility figurine to the cover of the *Daily Mail* announcing the birth of the first test-tube baby in Great Britain in 1978. Each exhibit is accompanied by a one-page notice. In addition, more than 150 vivid illustrations appearing in the different chap-

ters contribute to making *Reproduction* a lavish book, akin to an art book (including a certain weight).

While the title of the book does not feature the word “generation,” which was part of the title of the research project, the book nevertheless articulates both the notions of “generation” and “reproduction” in very interesting and unexpected ways. According to the authors, “generation” can be described as a large and loose framework for discussing procreation and descent, and while it is normally associated with living beings, whether animal or plant, it has also been extended to minerals (Laurence M. V. Totelin, “Animal and Plant Generation in Classical Antiquity,” chap. 4). “Reproduction” can be defined as a “more abstract process of perpetuating species” (and restricted to them) and represents a set of ideas and practices that are specifically modern (Hopwood, Flemming, and Kassell, “Reproduction in History,” chap. 1) (p. 4).

Drawing on Michel Foucault’s *Les Mots et les choses* (1966)—translated as *The Order of Things*—and François Jacob’s *La Logique du vivant* (1970)—translated as *The Logic of Life*—which both emphasize rupture (“epistemological breaks” to use Gaston Bachelard’s terminology) in the history of life sciences, Hopwood argues that the 1740s

marked the birth of the term “reproduction” in its modern sense, when, for instance, the Swiss naturalist Abraham Trembley regenerated polyps (tiny fresh water animals) by slicing and sieving them in search of a model for reproduction in general. However, as Hopwood argues, the word caught on quite slowly and it is only in the middle of the twentieth century that it moved to center stage (Hopwood, introduction to part 3 and “The Keywords ‘Generation’ and ‘Reproduction,’” chap. 20). While the overall story of the field as it is told here highlights sudden changes or discontinuities, it also recognizes continuities. Thus, in our eyes, the historical approach adopted here fits the argument John Pickstone developed in *Ways of Knowing* (2003) that “revolutionary changes in science may *displace* previous ways of knowing but they do not wholly *replace* them.”[1]

In addition to these crucial notions of “generation” and “reproduction,” the book also explores the concept of “population.” While population emerged as an object of knowledge in the eighteenth century, notably with Thomas Malthus’s famous *Essay on the Principle of Population* (1798) and Nicolas de Condorcet *Essai pour connaître la population du royaume* (1783-88), this book argues that its roots can be traced back to antiquity. Again we see the benefits of writing a *longue durée* history of the life sciences and medicine, allowing us to retrieve both continuities and discontinuities. *Reproduction* explores how the concept of population is entangled with the ideals and realities of control in the history of contraception and abortion, pregnancy, and childbirth. Again, the authors refer to Foucault, this time using his concept of “biopolitics” to discuss forms of power exercised by nation-states, particularly the regulations that are brought to bear on the lives of individuals and populations.

The book is divided into five sections arranged chronologically, followed by a twenty-six-page bibliography and a thirty-page index. Part 1, “Inventing Generation,” spans from ancient Egypt to the

demise of the Roman Empire. According to Flemming, who coordinated this first part, the notion of seed played a pivotal role in the story of generation, which began in the ancient Mediterranean, that is, in the late fifth and fourth century BCE. Similarly, Flemming argues that the earliest surviving literature on population dates from the same period (introduction to part 2). She gives the example of Plato’s ideal *polis*, which was supposed to contain 5,040 citizen farmers, male heads of landed households, a stable population to be maintained through a range of measures. And it was not only the quantity but also the quality of the population that mattered at this time. Plato’s *Republic* contains a passage about the necessity of favoring marriages between members of the elite, while the city of Sparta is famous for having set up the practice of killing weak or sickly newborn babies by throwing them off Mount Taygetus, near Sparta, a practice later cited by evolutionists as an example of artificial selection among humans (Flemming, “States and Populations in the Classical World,” chap. 5).

Part 1 goes back before ancient Greece and recounts the ways Egyptians and people from the ancient Near East discussed the question of generation by resorting to myths and emphasized the role of the male as the main creative force of life and the cosmos (Stephanie Lynn Budin, “Phallic Fertility in the Ancient Near East and Egypt,” chap. 2). This challenges a standard narrative that equates the female with fertility and minimizes the role of the male. Although questions of generation continued to be explored in myth during the Greek period (the birth of Athena from Zeus’s head is just one example), male Greek doctors, unlike their Egyptian and Near Eastern counterparts, provided a new form of written medical discourse with a strong and explicit theoretical dimension (Helen King, “Women and Doctors in Ancient Greece,” chap. 3). While in the ancient Egyptian and Near Eastern worlds, life came from the male, Greek doctors viewed female and male as both contributing to the process of generation, albeit playing unequal

roles. For instance, in Hippocrates's writings, the role of the female was emphasized, arguing that she provides both the seed and the blood needed for the growth of the baby in her womb.

Following the approach of Hippocrates, Galen, a central figure in imperial Roman medicine, emphasized the role of the mother in generation, although he considered the female genitals to be an inverted, and thereby inferior, version of the male ones. Similarly, the female "sperma" was feeble in comparison with the male elements associated with the qualities of speed and strength. This emphasis on the maternal role in the generation should not lead us to forget that the societies under the Roman Empire were still male dominated. In ancient Greece and Rome, a respectable woman citizen could only have sex within marriage, while men could enjoy it outside the household. In Rome, the *paterfamilias* enjoyed unique power over their children and descendants. Finally, part 1 explores the debate around the "ensoulment" of the fetus, especially among Neoplatonists and Christians, and shows how this issue became linked with a different set of political and theological concerns that became entrenched during the Middle Ages (Marie-Hélène Congourdeau, "Debating the Soul in Late Antiquity," chap. 8).

Part 2, "Generation Reborn and Reformed," covers the medieval and early modern periods. This group of eleven chapters, coordinated by Kassell, demonstrates how the concept of generation was refashioned by Arabic and Byzantine scholars and religious reformers who sought to restore Christian doctrine to its true form. This part highlights the contribution of such scholars as Ibn Sina (Avicenna) and Ibn al-Nafis, who in eleventh-century central Asia and thirteenth-century Egypt respectively, reworked and expanded debates about the importance of the female seed and the formation of the fetus, both endorsing and challenging older authorities, such as Aristotle and Galen. One pressing question was that of the kind of genera-

tive matter each parent contributed to the fetus (Kassell, introduction to part 2).

Part 2 also shows how the Black Death influenced Christian theologians, making them aware of the necessity of encouraging fruitful marriages, something that clashed with their former attitude of valuing abstinence, with the following consequence of limiting offspring. This positive attitude toward marriage and sex was echoed in Arabic and Galenic texts. The church's laws now encouraged the obligations of spouses to honor each other's desire for sexual gratification. Husbands were even led to express concern about their wife's fertility as shown by seventh-century medical casebooks containing observations of changes in women's body, examination of urine, etc. However, this new configuration, which made the union between husbands and wives more sacred, was asymmetrical. Men could have sex and have children outside marriage without any particular sanction, while women would be punished for such behavior (Kassell, introduction to part 2).

The history of medieval and early modern pregnancy has generally focused on contraception, abortion, and infanticide. The story told here emphasizes the fact that medieval families in Europe were indeed more interested in promoting fertility than limiting it. This can explain why women turned to male practitioners of all sorts to enhance their fertility or, but to a lesser extent, to terminate unwanted pregnancies (Katharine Park, "Managing Childbirth and Fertility in Medieval Europe," chap. 11). Also, across this period and into later centuries, people used magical words and objects and prayed to saints to promote fertility and childbirth (Lea T. Oslan, "A Medieval Birth Girdle," exhibit 11). Patients could also consult physician-astrologers, who by looking at the position of the heavenly bodies, judged the effects of the planets, notably in the case of a desired pregnancy (Kassell, "Fruitful Bodies and Astrological Medicine," chap. 16, and "Jane Dee's Courses in John Dee's Diary," exhibit 14). More generally, part 2 shows how

knowledge on generation and the way this knowledge was communicated helps us to revise older constructions of the “Scientific Revolution” as the triumph of rationality and the Enlightenment as a disenchantment of the world (Kassell, introduction to part 2).

Part 3, “Inventing Reproduction,” coordinated by Hopwood, deals with the emergence of the concept of “reproduction,” a concept that overlaps with “generation.” Emerging in the 1740s, the term “reproduction” appeared in the writings of the French naturalist, Intendant of the Jardin du roi in Paris, Georges-Louis Leclerc, Comte de Buffon and those of the physician and economist François Quesnay in the late eighteenth century. “Reproduction” came to prominence in the nineteenth century accompanying the development of industrial capitalism. Feminist historians have argued that it is with the transfer to capitalist modes of reproduction that women lost control over their bodies, up to the point of being dehumanized and considered solely as baby-producing machines (Hopwood, introduction to part 3).

While “reproduction” did gain ground in the eighteenth century, theories of generation remained prominent in biological thinking. In the 1730s, when he fashioned his “sexual system,” the Swedish botanist Carl Linnaeus linked generation to the crucial issue of the classification of nature. If at first glance, Linnaeus seemed to have looked at the plants’ reproductive parts through fixist and gender-biased spectacles, a deeper analysis of his “sexual system” discloses a more complex and unruly world of sexual forces and desires (Staffan Müller-Wille, “Linnaeus and the Love Lives of Plants,” chap. 21). Concerns about human generation, reproduction, and descent shaped what was called the “natural history of man” and contributed to the development of racial theories in the late eighteenth and early nineteenth centuries (Renato G. Mazzoloni, “Colonialism and the Emergence of Racial Theories,” chap. 25). In his groundbreaking *Making Sex: Body and Gender from the*

Greeks to Freud (1990), Thomas Laqueur argued that the two-sex model emerged in the seventeenth century after the discovery of “eggs” and “little creatures” in the male semen. In the current volume, Florence Vienne challenges this approach by showing that the role of eggs and sperm in generation was still a topic of debate among physiologists, cytologists, and zoologists in the mid-nineteenth century. It was only in the late nineteenth century that a model of reproduction was put into place in which the two sexes played equal parts (“Egg and Sperms as Germ Cells,” chap. 28).

Part 3 also examines the rise of man-midwifery as another issue articulating the modern concept of “reproduction” with that of population. According to traditional narratives, the use of the forceps was the main factor in the emergence of man-midwifery in the late eighteenth and early nineteenth centuries. Mary E. Fissel challenges this idea by situating the shift to man-midwifery within the context of larger changes in women’s work, beyond the limits of England, where the shift was swift and accompanied by the novelty of the forceps. Fissel shows that men’s convictions about their value in the delivery of a living baby, as well as the belief among English and American obstetricians that midwives were ignorant, superstitious, and dirty, helped them to secure their place in the business of child delivery (“Man-Midwifery Revisited,” chap. 22).

Part 4, “Modern Reproduction,” coordinated by Hopwood, addresses the diffusion of the concept of “reproduction” in the context of industrialized nations that experienced rapid economic growth and urbanization starting in the late nineteenth century. The number of children per family had already begun to decline starting in the eighteenth century, and this trend continued unabated into the late nineteenth and early twentieth centuries. People in industrialized countries increasingly limited the size of their families, while governments battled against contraception and abortion, seconded by medical professionals con-

cerned to preserve their respectability. Tensions arose between Neo-Malthusians who promoted different means for reducing the birth rate—such as condoms, female contraceptive devices, abstinence, withdrawal, and even abortion—and those who defended anti-abortion laws, opposed the diffusion of contraceptive devices, and encouraged large families (Hopwood, introduction to part 4). The availability of effective means for controlling reproduction favored a disconnection of sex from reproduction, a development that upset religious objectors and nationalist pro-natalists alike, but it would become a major feature of the modern world (Lesley A. Hall, “Movements to Separate Sex and Reproduction,” chap. 29). In the 1930s, the “family planning” movement was created, while measures to enhance maternal and infant welfare were also set up. This concern for protecting the mother’s and the child’s health developed in European countries also shaped imperial politics, and colonies served as testing grounds for practices that would then be adopted at home. Reproduction thus became a significant area for state intervention both at home and in the colonies (Philippa Levine, “Imperial Encounters,” chap. 33).

The nineteenth century, of course, also witnessed a shift from concerns about the quantity of children to those about the “quality” of these births. “Eugenics” was a term coined in England in 1883 by Francis Galton to designate the new science aimed at improving the population by controlled breeding. The goal was to increase the occurrence of desirable heritable characteristics, and beyond its inspiration in Charles Darwin’s theory of natural selection, eugenics was able to mobilize the fledgling science of genetics before World War Two. The fate of eugenics varied according to the political systems in which it developed. In the United States, it was bound to racial issues and influenced the enactment of immigration laws, as well as leading to the sterilization of people considered mentally deficient or exhibiting socially disruptive behavior. In Nazi Germany, eugenics was associated not only with forced sterilization but also with

some of humanity’s darkest deeds, such as the euthanasia of feeble-minded people and the genocide of races considered to be inferior.

In the late nineteenth and early twentieth centuries, knowledge arising from laboratory research changed the understanding of reproductive physiology, from the discovery of the process of fertilization in the 1870s, to the biochemical and cellular explanations of the female menstrual cycle and the identification of sex hormones. These discoveries yielded connections between gynecological clinics, research laboratories, and pharmaceutical companies (Jean-Paul Gaudillière, “Sex Hormones, Pharmacy and the Reproductive Sciences,” chap. 35). Pregnancy tests were one of the major practical outcomes of this network and were already available to doctors starting in the late 1920s.

Part 4 deals with sex education. Human reproduction was already addressed in the education of the young in the early twentieth century, but it only entered the school curriculum in the 1960s (Hopwood, introduction to part 4). This section also provides insights into the topic of infertility, which received relatively little attention from the medical profession when compared to contraception and abortion, as seen above (Christina Benninghaus, “Modern Infertility,” chap. 31).

Part 5, “Reproduction Centre Stage,” coordinated by Hopwood, shows how childbirth and contraception were further medicalized after World War II. Childbirth entered the hospital, which came to be presented as the only appropriate place to give birth, a conception backed up by a decline in maternal mortality. In parallel, biomedical innovations were made available: not only the contraceptive pill, which was marketed in the United States in 1957, but also new intrauterine devices and technologies for assisted reproduction (Jesse Olszynko-Gryn, “Technologies of Contraception and Abortion,” chap. 36, and Hopwood, “Artificial Fertilization,” chap. 39). Since Louise Brown, the first test-tube baby born in 1978, five million ba-

bies have been born using IVF (in vitro fertilization) around the world (Hopwood, chap. 39, and “It’s a Girl,” exhibit 38).

Starting in the 1960s, as science and medicine took control of childbirth (now safer) and contraception (now respectable), feminist activists challenged medical authority and started campaigning against “battery births,” arguing that women should take back control of their own bodies. In the 1970s, feminist action took more radical forms to make medical services more sensitive to their needs and to change the doctor-patient relationship (Hopwood, introduction to part 5). A best-selling manual, *Our Bodies, Ourselves* (Wendy Kline, “*Our Bodies, Ourselves*,” exhibit 35), played a pivotal role in putting reproduction on the agenda of modern economies and societies and in challenging the reductive determinism that had naturalized women as mothers and limited their activity to child care and the domestic sphere. Criticisms of medical authority also included calls for greater choice in maternity care, even extending to an outright rejection of hospital obstetrics (Salim Al-Gailani, “Hospital Birth,” chap. 37). Struggle for abortion laws loomed large in the fight for women’s rights as demonstrated by the case of *Roe v. Wade*, a landmark 1973 decision of the US Supreme Court, which ruled that the right to privacy under the Fourteenth Amendment Due Process Clause of the US Constitution extended to a woman’s decision to have an abortion (Martin H. Johnson and Nick Hopwood, “Modern Law and Regulation,” chap. 40).

Eugenics survived into the postwar period, generally assuming new forms. For instance, eugenics journals and institutes flourished, and a new profession of genetic counseling came into existence (Hopwood, introduction to part 5). The 1960s and 1970s witnessed the development of prenatal diagnosis, radically changing the experience of pregnancy for tens of millions of women around the world. In the 1970s and 1980s, the major argument in favor of such prenatal tests was to

reduce the incidence of Down’s syndrome. Improved resolution achieved with more sensitive obstetric ultrasound favored not only the direct observation of numerous fetal anomalies but also the identification of other risk markers. Although pregnant women might no longer be anxious about putting their lives at risk in giving birth, the possibility of identifying birth defects through prenatal diagnosis seems to have generated new fears associated with pregnancy (Ilana Löwy, “Prenatal Diagnosis, Surveillance and Risk,” chap. 38).

Since World War II, biomedicine, which “combines biomedical research, medical care, industry and state regulation in a variety of feedback loops,” has expanded, participating in the globalization process (Hopwood, introduction to part 5). Surrogate motherhood is a good example of how globalized trade can have an impact on the way a baby is conceived, carried, and born. Hopwood refers to the documentary *Google Baby* (2009), which presents the case of Indian women becoming pregnant for would-be parents in America and Israel: “if in the 1960s, the introduction of the birth control pill separated sex from reproduction, today, new technologies have taken sex out of the act of ‘making babies’.” And globalization is making it affordable” (p. 641). Certainly the case of Indian surrogate mothers helps us to reflect on transnational reproduction and on the diversity of regulations for activities like surrogate pregnancy, questions that also apply to the use of donor gametes or the freezing of embryos in a globalized world.

By dealing with so many cases and histories taken from different times and places, *Reproduction* helps us to revise received (or preconceived) ideas about generation, reproduction, and population. It clearly demonstrates the diversity of perceptions of generation and reproduction over time, and points to how deeply these notions are socially embedded. It also very convincingly shows that even if people turn to science when seeking to conceive, maintain a pregnancy, or safely give birth, they can still invoke the aid of

higher powers, go to shrines, or devote themselves to different rites (Jessica Hughes and Rebecca Flemming, “The Room of Ribbons,” exhibit 40).

By looking at the history of generation and reproduction across such a large chronological scale, such a large thematic scope (from egg to population), and in such a variety of geographical spaces, *Reproduction* allows us to better understand the complexity of our current world and opens up new ways of thinking about sexuality and ways of procreating. It gives us a new map (and a beautifully illustrated one!) as well as a tool kit for thinking about reproduction in the contemporary world. It also equips us intellectually to reflect on current issues surrounding reproduction and to develop a critical attitude toward contemporary developments in this domain.

Moreover, *Reproduction* provides us with an excellent pedagogical tool, which is likely to help us to renew and refresh our teaching in the history of the life sciences and medicine. No doubt, this book constitutes a large and rich source of texts that will be relevant to teach and trigger discussions during seminar readings. Similarly, the lavish illustrations of the “exhibits” section as well as the other figures that feature in the different chapters could be used in a fruitful way in classrooms or lecture halls to incite students to reflect on the reproductive sciences and demographics of our world. It is difficult to complain about what has not been covered in this book, as the material is so dense and the analysis so thorough. Nevertheless, and considering that animals have a privileged place in the history of generation and reproduction—and the book in different places points out the importance of animal models in the understanding of human reproduction—a consideration of animals, particularly as experimental subjects in physiological and pharmaceutical laboratories, or on the farm, could add another pertinent layer to the history of reproduction. The example of Dolly the sheep, the first mammal to be cloned, comes readily to mind, but there is also a mass of other

animals—frogs, does, dogs, rabbits, monkeys—largely forgotten, but whose sacrifice contributed to our knowledge of generation and reproduction and the development of the reproductive sciences. This suggestion does not, of course, detract from the value of this book, which is an important contribution to the history of reproduction and the history of life sciences more generally. It is essential reading for specialists and nonspecialists interested in human reproduction and all the burning questions, be they scientific, ethical, or political, associated with this field.

Note

[1]. John V. Pickstone, *Ways of Knowing: A New History of Science, Technology and Medicine* (Manchester: Manchester University Press, 2003), 25.

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