

BOOK REVIEW

Designing Babies: How Technology is Changing the Ways we Create Children by Robert L. Klitzman (2019) Oxford University Press, New York, 344pp., \$US20 (hardback) ISBN: 9780190054472

A common trope in futurism is that, just as the twentieth century has often been characterized as the century of physics, so the twenty-first century will probably be characterized by historians as the century of biology. The first test tube baby, created through *in vitro* fertilization, was born in 1978 in the United Kingdom. A pair of genetically engineered babies was recently born in China. Physicians specializing in helping infertile couples to have children now flourish in a multi-million dollar industry.

Robert L. Klitzman, a psychiatrist and bioethicist at Columbia University, has conducted a study of the current state of assisted reproductive technology (ART). His methodology included carrying out 37 extensive interviews. Klitzman draws heavily on these interviews in his book, using quotes to make the situations discussed emotionally real in human terms. I was struck by how many of his quotations are from rabbis and wonder if self-selection for interviewees has introduced a degree of distortion. However, the various Jewish communities have a wide variety of beliefs and attitudes towards ART.

Approximately one in ten heterosexual couples have difficulty conceiving children. This percentage is not significant on a larger scale because there are plenty of fertile people to produce the next generation; and it is even less relevant in a world struggling with excess population. But it does matter to the individuals who cannot readily make their own children. The biological and social urge to have children can make infertile people feel incomplete and inadequate, though the emotional burden of these difficulties falls primarily on women.

ART encompasses a variety of techniques, not just IVF (*in vitro* fertilization). These include traditional surrogacy (where the woman agrees to be medically inseminated by a man's sperm and her own egg is used), and gestational surrogacy (where the woman only lends her womb for IVF). The first step before resorting to expensive IVF is often intrauterine insemination (IUI), where a doctor places the sperm directly into the woman's cervix or uterine cavity when the woman's cycle is most likely to release eggs. The sperm may have been treated and concentrated to maximize its potency. The technique is pervasive in the livestock industry.

Reproductive technologies are lightly regulated in the United States, by either governments or the medical profession, and are often not covered by medical insurance. Many European countries have stronger regulation, but also cover the procedures with medical insurance. Regulation and insurance often go hand in hand. It is even legal in the United States for women to sell their eggs, though medical professionals recognize that this creates ethical problems.

Medical personnel involved in ART persistently fight certain misunderstandings and myths about reproduction. Perhaps the most pervasive is not understanding that the fertility of women drops precipitously as they approach and pass the age of 40. Even the successful use of ART follows the same harsh curve, with a woman's chances of success spiralling down the older she gets. It does not help that older celebrities often receive considerable press coverage when they have children, though the actual details, such as the use of a surrogate, are often not mentioned in press coverage.

This book is written to be accessible to a popular audience and will be useful for anyone considering the use of assisted reproductive technologies. Though ART and IVF can be difficult, expensive and disappointing, when they are successful we have happy parents and happy children. Gay couples and women who are single by choice also have the opportunity to become parents.

Preimplantation genetic diagnosis (PGD), genetically testing embryos before implantation in the womb, has become common. It is now possible to test for a variety of genetic diseases, such as cystic fibrosis, sickle-cell anaemia and spinal muscular atrophy. Testing for such diseases can

also occur *in utero*, though the answer at that point is an abortion, rather than discarding an embryo in the laboratory. PGD is not always successful as many hereditary diseases do not have obvious identifying genetic sequences.

Some parents want to test for the sex of their embryos and to discard embryos of the wrong sex. Some fertility doctors refuse to test for sex, a position articulated by one of Klitzman's sources, a Minnesota-based fertility specialist: 'Sex is not a disease!' (p.112). Other doctors are willing to select embryos based on sex where the wish is to balance the sex of the family's children. Still other doctors are content to select embryos to satisfy a range of requirements. Patients can also shop for the fertility doctor they want. The result is that sex selection has become increasingly common in the United States through ART. Sex selection through ultrasound and abortion in China, India and South Korea distorts populations by millions of excess sons. There is little research following up on the lives of babies born using ART. Such studies are expensive, difficult and require patience. There is some evidence, which usually appears only after the children enter school, that children of IVF and intracytoplasmic sperm injection have greater 'rates of intellectual disability' (p.266).

While the title of the book is accurate, the content is mostly about the current state of the ART industry. The more provocative implications of designing babies and genetic engineering of children are only lightly touched on. Klitzman mentions CRISPR (clustered regularly interspaced short palindromic repeats) multiple times, but that revolutionary technology has only been used once on live babies and a recent study has found that CRISPR is not as precise as we would like when editing the human genome. We do not know how most genes work and how most genetic traits are formed. Characteristics such as intelligence and sexuality are almost certainly the result of many genes interacting with each other in complex ways. While most of the potential for genetically designing children remains in the realm of science fiction, the possibility of important new developments in the near future is real.

Klitzman's research will be useful for bioethicists seeking better understanding of the current state of ART and PGD. Fertility doctors confront ethical quandaries and the history of ART and PGD shows that if the technology exists then someone will use it in irresponsible ways. Perhaps the most notorious case of IVF, the Octomom, was deliberately implanted with twelve embryos and successfully had eight children (Popescu, 2018). Her fertility doctor afterwards lost his state medical licence.

Stepping out of my dispassionate academic persona, I will end this review with a couple of personal reactions. The practice of traditional surrogacy, where the surrogate's egg is used, made me ask: how is this not selling children (p.141)? I also remembered a personal story. When my daughter was 16, she told her parents, 'I think that I will adopt when I have children, because we have bad genes.' My wife was rather offended and I was rather surprised. It was the first time our daughter had ever talked about having children and her concern was genuine, stemming from certain disorders that obviously run in the family. Adoption will not be the only solution: the invention of IVF, genetic engineering, and now CRISPR, have given my daughter new options. The only problem is that, while our family disorders obviously have a genetic component, we have no idea which genes might be altered. Still no grandchildren for us, but there is a future in which parents take ever greater medical control over procreation. Eugenics seems a strong possibility.

Reference

Popescu, A. (2018) 'The Octomom has proved us all wrong', *New York Times*, 15 December, available at <https://www.nytimes.com/2018/12/15/style/octomom-kids-2018.html> (accessed March 2021).

Eric G. Swedin
Department of History, Weber State University
Ogden, Utah, United States
eswedin@weber.edu