

RETRO REPORT

Scientists Can Design ‘Better’ Babies. Should They?

By Clyde Haberman

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For nine frustrating years, Lesley and John Brown tried to conceive a child but failed because of her blocked fallopian tubes. Then in late 1977, this English couple put their hopes in the hands of two men of science. Thus began their leap into the unknown, and into history.

On July 25, 1978, the Browns got what they had long wished for with the arrival of a daughter, Louise, a baby like no other the world had seen. She came into being through a process of in vitro fertilization developed by Robert G. Edwards and Patrick Steptoe. Her father’s sperm was mixed with her mother’s egg in a petri dish, and the resulting embryo was then implanted into the womb for normal development.

Louise was widely, glibly and incorrectly called a “test-tube baby.” The label was enough to throw millions of people into a moral panic, for it filled them with visions of Dr. Frankenstein playing God and throwing the natural order of the universe out of kilter. The reality proved far more benign, maybe best captured by Grace MacDonald, a Scottish woman who in January 1979 gave birth to the second in vitro baby, a boy named Alastair. Nothing unethical was at work, she told the BBC in 2003. “It’s just nature being given a helping hand.”

In this installment of its video documentaries, Retro Report explores how major news stories of the past shape current events by harking back to Louise Brown’s birth. If anything, more modern developments in genetics have raised the moral, ethical and political stakes. But the fundamental questions are essentially what they were in the 1970s with the advent of in vitro fertilization:

Are these welcome advances that can only benefit civilization? Or are they incursions into an unholy realm, one of “designer babies,” with potentially frightening consequences?

In vitro fertilization, or I.V.F., is by now broadly accepted, though it still has objectors, including the Roman Catholic Church. Worldwide, the procedure has produced an estimated six million babies, and is believed to account for 3 percent of all live births in some

developed countries. Designer-baby fears have proved in the main to be “overblown,” said Dr. Paula Amato, a professor of obstetrics and gynecology at Oregon Health & Science University in Portland. “We have not seen it with I.V.F. in general,” she told Retro Report. “We have not seen it with P.G.D.”

P.G.D. is shorthand for pre-implantation genetic diagnosis, developed more than two decades ago and an offshoot of in vitro fertilization. Couples with family histories of serious diseases — cystic fibrosis, Tay-Sachs and Down syndrome are among the more common — can have their lab-created embryos tested for the probability of passing the flaws to their offspring. Technology in effect gives them a measure of control over their genetic fate. An embryo that looks O.K. under a microscope can be implanted in the mother’s uterus for normal development. (Typically, the others are discarded, itself a morally fraught practice for some people).

But what if the issue isn’t averting a dreadful disease? What if would-be parents, rather than leaving the matter to an old-fashioned roll of the genetic dice, resort to embryonic selection to guarantee the child is of a particular sex? It can be done with pre-implantation genetic diagnosis. Dr. Jeffrey Steinberg, director of The Fertility Institutes in New York, does it as matter of course.

“The technology was out there — it was being applied only to diseases,” Dr. Steinberg told Retro Report. He continued: “I’ve decided to open the door and expand it and say, ‘Listen, this is something that people are interested in, causes no harm, makes people happy. Let’s expand it.’” Though many doctors are strongly skeptical, he also offers P.G.D. to improve the odds that a baby will have a desired eye color, practically casting himself as the Benjamin Moore of the laboratory with his “choice of 30 shades of blue eyes.”

Still other gene-altering techniques are now in play. Mitochondrial transfer, for one, is intended for a woman whose genetic makeup makes it likely she will bear a child with a severe birth defect. DNA is removed from her egg and implanted in an egg from another woman that contains healthy energy-generating components known as mitochondria. This has given rise to the discomfiting term “three-parent baby.”

Then there is a gene-editing method called Crispr, the acronym for a mouthful of a procedure: Clustered Regularly Interspaced Short Palindromic Repeats. A team led by Shoukhrat Mitalipov, an American reproductive biologist, announced last year that it had applied the technique to change a human genome. With an enzyme called Cas9 acting as a scalpel, Crispr snipped away a mutated gene that can lead to thickened heart muscles and cause sudden death in young athletes.

In theory, it meant that if this embryo were implanted in a womb — it wasn't in this team's research — the child eventually born would not carry the mutation, and nor would any grandchildren. In short, that family's germ line, the genetic material governing cellular lineage from one generation to the next, would have been permanently altered.

As Louise Brown prepares for her 40th birthday next month, moral debates over the new capabilities echo those that swirled around her parents, both now dead.

Some ethicists see only good in the prospect of eliminating diseases that condemn families to misery. After all, don't childhood vaccinations amount to using technology for that very same purpose? Yet few people regard measles or polio shots as unacceptable fiddling with the natural world.

In a different camp are those who invoke slippery slopes, fearing unpredictable genes that may be unleashed. What, they ask, is to prevent gene editing from being used someday not to combat disease but, rather, to design people who are stronger or smarter than everyone else, able themselves to produce children programmed genetically for SAT scores of 1,600 or LeBron James point totals?

Then again, selecting genes to produce, say, a star basketball player is hardly a snap; height alone is influenced by tens of thousands of genetic variations. On the other hand (there is almost always another hand) the sheer expense of the procedures threatens to widen an already substantial gap between the wealthy and everyone else.

In 2017, an advisory group formed by the National Academy of Sciences and the National Academy of Medicine endorsed gene editing in principle, but with a proviso that it be used only to deal with "serious diseases and disability" and only when no "reasonable alternative" exists.

Some scientists say it is unwise to be paralyzed by fear of the unknown. But Marcy Darnovsky, executive director of the Center for Genetics and Society in Berkeley, Calif., is more skeptical. "We have to ask where is the stopping point," Ms. Darnovsky said, and she suggested that policy discussions include "a much broader range of voices" than just scientists.

Perhaps Shakespeare can enter the conversation. He bequeathed words often invoked to encapsulate both hope for and dread of human capability. They're from "The Tempest": "O brave new world, that has such people in't."

The video with this article is part of a documentary series presented by The New York Times. The video project was started with a grant from Christopher Buck. Retro Report, led by Kyra Darnton, is a nonprofit media organization examining the history and context behind today's news. To watch more, subscribe to the Retro Report newsletter, and follow Retro Report on YouTube and Twitter.

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