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Born Out of Love... And A Test Tube

For thousands of years, human beings were all conceived in the exact same way. A little bit of this, a little bit of that, and one lucky sperm met one lucky egg. They honeymooned in the uterine wall and 9 months later out came a miracle—a baby. Without sex, there would be no Queen Elizabeth, no Sir Isaac Newton, no human race! For many couples, a biological baby was out of the question. Infertility crushed the dreams of a child, while single women and same sex couples were forced to accept it wasn't in the cards. But that's the thing about the status quo, it changes, even for the basics of human life. Who could believe that human life could be made in a test tube?! Well... a few did: Dr. Patrick Steptoe, Dr. Robert Edwards, and a loving couple from Bristol, England, John and Lesley Brown. In 1978, the birth of their test tube baby, Louise Joy Brown, would change the world forever.

A young John and Lesley Brown met on the docks by the sea, and six years later they were married. While the two cared for a child from John's previous marriage, they longed to have a baby of their own. Lesley was eventually diagnosed with blocked fallopian tubes, a leading cause of infertility, where a fluid obstruction prevents the egg and sperm from meeting³. Lesley underwent surgery to repair her fallopian tubes, as microsurgical procedures were becoming more common during the 1970s⁴. Unfortunately for the Browns, the surgery was not successful. After more than a decade of trying, the couple was left distraught and drained...until a glimmer of hope appeared in a referral to Dr. Patrick Steptoe— nearly 200 miles away in Oldham, England ².

Dr. Patrick Steptoe is considered a hero in the field of obstetrics, but prior to his IVF fame he was also a war hero. During the onset of WWII, "he joined the Royal Navy Volunteer Reserve as a Surgeon."⁵ He was taken as a prisoner of war in Italy and put into solitary confinement after helping fellow prisoners escape. Once the war was over he returned to England and wasted no time specializing in obstetrics and gynecology. Before choosing medicine, Steptoe considered becoming a musician, but lucky for us he waved goodbye to that dream ⁵. His specialty become laparoscopic gynecology— minimally invasive surgical procedures that require small incisions, and insertion of a long tube, with a camera on the end⁷.

² Dow, K. (2018). 'Now she's just an ordinary baby': The birth of IVF in the British press. *Sociology*, 53(2), 314–329. <https://doi.org/10.1177/0038038518757953>

³ Ambildhuke, K., Pajai, S., Chimegave, A., Mundhada, R., & Kabra, P. (2022). A Review of Tubal Factors Affecting Fertility and its Management. *Cureus*, 14(11), e30990. <https://doi.org/10.7759/cureus.30990>

⁴ Sotrel G. (2009). Is surgical repair of the fallopian tubes ever appropriate?. *Reviews in obstetrics & gynecology*, 2(3), 176–185.

⁵ Brinsden, Peter. (2009). Thirty years of IVF: The legacy of Patrick Steptoe and Robert Edwards. *Human fertility* (Cambridge, England). 12. 137-43. 10.1080/14647270903176773.

⁷ *Laparoscopic gynecological Surgery*. (n.d.). Baylor College of Medicine. <https://www.bcm.edu/healthcare/specialties/obstetrics-and-gynecology/ob-gyn-procedures/laparoscopic-gynecological-surgery>

According to various reports, his colleagues thought it would never “catch on”⁵. Well, the joke’s on them. Laparoscopic surgery was a game changer for female reproductive procedures, and full hysterectomies can now be done through just four small incisions ⁶. Dr. Steptoe became particularly interested in oocyte identification. Oocytes are female germ cells that can eventually mature into an egg cell; choosing oocytes is essential for successful IVF treatment. Dr. Robert Edwards, his future partner, also had an interest in oocyte retrieval. Edwards, also a veteran, was highly interested *in vitro* fertilization ⁵. The literal translation of *in vitro* is “in glass”, or in a test tube—a fitting image for groundbreaking scientific discovery. After Edwards attended a laparoscopy lecture by Steptoe, he reached out to him suggesting collaboration—a partnership that would go down in history ⁵.

Infertility was not just a battle for the Browns, but for Steptoe and Edwards. They continuously improved their skills, performing oocyte recovery, studying the sperm, and developing a deeper understanding of the requirements for a successful fertilization. They also worked alongside Jean Purdy, a female scientist often forgotten for her important contributions to the success of IVF. She was the first to see an embryo divide outside of the body, which had proven unsuccessful until then. Their first human embryo transfers began in 1972, and none of their first 40 patients became pregnant ⁵. The truth is, the innate way in which humans come to be is not simple at all—it requires near perfect conditions, and many of these things were misunderstood before Edwards and Steptoe. In 1976, a breakthrough, when their first patient tested positive for pregnancy following preimplantation of the fertilized embryo. This first success came after a single blastocyst transfer; a blastocyst is the small cluster of cells a couple of days after successful fertilization and in this case only one was transferred back into the uterus. This is not always favored due to low pregnancy rate, but reduces the risks of twins, triplets, quadruplets (ouch) etc. ⁸. Unfortunately, despite this new success, it was an ectopic pregnancy, when a fertilized egg implants itself outside of the uterus. Setbacks plagued the gynecological duo and a determined Lesley and John Brown continued to seek new avenues. It was later in 1976 that the Browns made their journey to see Dr. Steptoe.

Lesley Brown was a very ordinary woman, who was about to take part in one of the most extraordinary accomplishments in medical history. She would be the first of millions of women to give birth to a healthy baby, who was created in a test tube and wanted so fiercely. But before that, real trials had to be overcome. A shy Lesley was known for being introverted, caring, and determined ~~nature~~²—one simply had to be to undergo 102 failed embryo transfers ⁵. There was no injection of hormones to induce the growth of oocytes, so selection was crucial. Today a hormone called human menopausal gonadotropin (hMG) is injected prior to egg retrieval. It led

² Dow, K. (2018).

⁵ Brinsden, Peter. (2009).

⁶ *Common Gynecologic Procedures* | Boston Medical Center. (n.d.). Boston Medical Center. <https://www.bmc.org/gynecology/common-procedures>

⁸ David K Gardner, Eric Surrey, Debra Minjarez, Annette Leitz, John Stevens, William B Schoolcraft, Single blastocyst transfer: a prospective randomized trial, *Fertility and Sterility*, Volume 81, Issue 3, 2004, Pages 551-555, ISSN 0015-0282, <https://doi.org/10.1016/j.fertnstert.2003.07.023>.

to greater oocyte retrieval, and IVF pregnancy rates of 30% by 1983¹⁴. On November 10th, 1977 an oocyte was laparoscopically recovered, and this was one lucky egg. The retrieval process is the most invasive part of the procedure, and was done under general anesthesia. The egg was then transferred to a petri dish, where it was incubated with sperm at 37°C, and a culture media composed of sugars, amino acids, water, saline and most likely a serum composed of human fallopian tube fluid¹⁰. After 2 and a half days, and 3 cell divisions, the 8 cell blastocyst was re-implanted in Lesley Brown's uterus⁹. This was done using a catheter, and is a similar experience to getting a pap smear— not totally awful, but I certainly wouldn't want to do that 102 times! Overjoyed, the team had successfully gotten Lesley Brown pregnant. While a difficult pregnancy awaited, the Browns were thrust into the media spotlight.

Their story was covered in dozens of newspapers both inside and outside of the United Kingdom, but a private agreement allowed the *Daily Mail* access to the main sources². The portrayal of the Browns was not to be taken lightly; the attitudes surrounding IVF relied on generating sympathy towards family struggles like infertility. At the time the *Daily Mail* had a more conservative viewership, focused on traditional family values². The Browns were an ordinary working class couple, deemed worthy by the public and the press to undergo this groundbreaking experiment. The depiction of Lesley as an introverted loving housewife and mother was true, but deflated the quiet quest for autonomy that her journey highlights. Her courage was truly unmatched. However there was much to be said about how this approach normalized IVF as something powerful not something evil. Among intense media attention, there were growing concerns about the safety of Lesley and the fetus. This created great stakes for not just the Browns, but Edwards and Steptoe. Dr. Steptoe hid Lesley in his car and drove to his mother's house, where Lesley stayed for a period of time safe from the press¹¹.

Getting pregnant was only the first hurdle, but each small victory was one step closer to a medical revolution. During week 16 of her pregnancy, the doctors performed an amniocentesis. This procedure, in which amniotic fluid is removed from the amniotic sac for testing, found that the fetus had no chromosome abnormalities, and normal protein levels⁹. Thanks to IVF, modern parents don't always have to wait till 15 weeks for this test— fatal and dangerous abnormalities can be detected when the embryo is just 6 to 10 cells¹⁴. Lesley's ultrasounds showed that after week thirty, Louise's growth began to slow, and placenta and blood testing showed lower than

² Dow, K. (2018).

⁹ P.C. Steptoe, R.G. Edwards, BIRTH AFTER THE REIMPLANTATION OF A HUMAN EMBRYO, *The Lancet*, Volume 312, Issue 8085, 1978, Page 366, ISSN 0140-6736, [https://doi.org/10.1016/S0140-6736\(78\)92957-4](https://doi.org/10.1016/S0140-6736(78)92957-4).

¹⁰ Eskew, A. M., & Jungheim, E. S. (2017). A History of Developments to Improve *in vitro* Fertilization. *Missouri medicine*, 114(3), 156–159.

¹¹ BBC News. (2012, June 20). *First test tube baby mother Lesley Brown dies*. <https://www.bbc.com/news/uk-england-bristol-18524232>

¹⁴ Wang, J., & Sauer, M. V. (2006). In vitro fertilization (IVF): a review of 3 decades of clinical innovation and technological advancement. *Therapeutics and clinical risk management*, 2(4), 355–364.

normal levels. This last trimester was critical stage and Lesley was diagnosed with preeclampsia⁹. Preeclampsia is a disorder associated with hypertension and swelling, and can affect both mother and baby¹². Luckily, this could be managed with medication and scheduled cesarean section. Like her mother, Louise exhibited determination during the end of the pregnancy, growing significantly in the last 10 days. Continued commotion from the press surrounded Oldham General Hospital; Lesley recounted fake bomb threats¹¹ and fake cleaners, in order to gain access to her room. As if being pregnant isn't stressful enough! A long and chaotic 38 weeks and 5 days after implantation⁹, the day finally came.

"Happy Birthday Louise!" could be heard around the world on July 25th 1978. Blonde, plump, beautiful, and most of all.. healthy. After initial examinations, everyone could breath a great and exasperated sigh of relief. Just six weeks after she was born, a documentary aired on the only commercial television channel in the UK, titled "To Mrs. Brown...A Daughter"¹³. The producer of the film, Peter Williams, came into their home and documented some of the first moments of Louise's life. Scenes of Louise lying on a mat, being cradled by her mother, and naked swaddled in a blanket told the public exactly what they wanted: that she was *normal*. And rather adorable at that. Birthday cards, prayers, and messages flooded in as the Browns returned to their home life, ordinary and filled with love.

The pregnancy and delivery were incredibly well documented— this was not just a matter of personal joy but rigorous medical research. Steptoe and Edwards had to prove without a doubt that Louise was conceived in a "test tube". The birth was filmed and many of the laparoscopic images from before and during pregnancy were shared in the documentary. Many doctors offered skepticism, citing that if Mrs. Brown's fallopian tubes were in tact, they could not be 100% sure in their feat⁵. Lesley's fallopian tubes were barely in tact when she was referred to Dr. Steptoe, and he removed them, once again laparoscopically, to gain better access to her ovaries. After the birth and certification, the duo was able to comment on their success for the first time. It marked a huge turning point for assisted reproductive technologies (ART), and a demystification of the female reproductive system. One documentary critic from the Guardian commented, "the TV pictures through a medical telescope into the womb are new and fascinating"¹³.

Life continued for the Browns, and through continued compassionate representation of their family's experience with infertility, they sought to give Louise as normal a life as normal could be. Edwards and Steptoe were not always granted this same compassion. As the understanding of IVF grew, so did the ethical conversations surrounding the controversial

² Dow, K. (2018).

⁵ Brinsden, Peter. (2009).

⁹ P.C. Steptoe, R.G. Edwards

¹¹ BBC News. (2012, June 20).

¹² Time. (1978, August 7). Medicine: Test-Tube Baby: It's a girl. *TIME*. <https://time.com/archive/6881341/medicine-test-tube-baby-its-a-girl/>

¹³ Dow K. (2019). Looking into the Test Tube: The Birth of IVF on British Television. *Medical history*, 63(2), 189–208. <https://doi.org/10.1017/mdh.2019.6>

procedure. Although in Louise's case only one egg was fertilized, in many cases there are multiple. This brought up a huge pro-life argument for the Catholic Church, and skepticism under a growing conservative movement. While the Browns were supported by the whole of England, the conservative media, and by Margaret Thatcher herself², the scientists were subjected to criticism. Dr. James Watson, famous for stealing the DNA discoveries of coworker Rosalind Franklin, called their work "dabbling with infanticide"⁵. After the birth of the second IVF baby, Alastair Macdonald, Steptoe and Edwards lost funding sources for their research and to set up an IVF clinic⁵. They managed to do this privately, and established Bourn Hall Clinic in Cambridge with the help of their collaborator Jean Purdy; thousands of healthy children were born out of this clinic's work.

Meanwhile, the Brown's continued life with their two daughters, speckled with media appearances around the globe. At four months old Louise and her parents were whisked to Canada, Japan, and Florida for IVF related appearances, followed by years in Paris, the United States and Brazil¹³. In 1979 a book was published chronicling Louise's story, titled "Our Miracle Called Louise". In 1982, Lesley had a second daughter through IVF named Natalie, who became the first person born through IVF to have children of their own¹. The Browns remained involved with the Bourn Hall Clinic, who celebrated milestones alongside the family. Patrick Steptoe died in 1988, almost 10 years after Louise's miracle birth¹⁹. In his obituary, written by friend and colleague Robert Edwards, he describes his steadfast determination and feminist upbringing¹⁹. Mrs. Steptoe's advocacy for women's rights most certainly rubbed off on her son, who enhanced reproductive freedoms for women around the globe.

Now 46, Louise Brown lives with her husband in Bristol, where her parents raised her. She has two naturally conceived sons; a testament to IVF's truest success. Cameron and Aiden Patrick Robert (named after Steptoe and Edwards)²⁰ are two of Lesley Brown's five grandchildren. Louise continues to advocate for access to IVF around the world, and in 2015 a book in Louise's voice was released, titled "Louise Brown: My Life as the World's First Test Tube Baby"². She has dozens of interviews detailing her childhood experience, and honoring her brave parents, John and Lesley, who died in 2005 and 2012 respectively. Many have asked Louise if she was bullied, ridiculed, or singled out for her special origins, but she always felt like an ordinary child, who just happened to come from an extraordinary embryo. Louise said, "People born through IVF are just like everyone else – some are nice, some are not; some are clever, some not so clever."² When Louise was in her first sex education class, she opened up the text book to a picture of herself, a blue eyed baby with her name in a caption below²⁰.

¹ *Papers of Lesley Brown, the first mother to conceive by IVF*. (n.d.). Bristol Archives Online Catalogue. <https://archives.bristol.gov.uk/records/45827>

² Dow, K. (2018).

⁵ Brinsden, Peter. (2009).

¹³ Dow K. (2019).

¹⁹ Edwards Robert Geoffrey 1996 Patrick Christopher Steptoe, C. B. E., 9 June 1913 - 22 March 1988 Biogr. Mem. Fell. R. Soc. 42:433–452

²⁰ CBS Sunday Morning. (2018, September 15). *Louise Brown on growing up the first test tube baby* [Video]. YouTube. <https://www.youtube.com/watch?v=YeQeNoKlcfc>

Every new chapter in Louise's life accompanied a new chapter in assisted reproductive technologies around the world.

More improvements have turned Louise's single page in a textbook into entire libraries. The ability to cryopreserve eggs, embryos, and sperm has allowed for many women to conceive later in life, on their own timeline. IVF has allowed for families to conceive without fear of dangerous hereditary genes and opened up a new line of research with embryonic stem cells. With greater improvements, ethical and religious debate has not subsided, but the opinions of the general public remain overwhelmingly positive. Today, over 12 million people have been born from in vitro fertilization technologies ¹⁷. That's millions of parents, whose dream to have a child was granted through a scientific miracle. Infertility has affected so many people, and for Lesley Brown, the yearning for a child caused a deep depression: "You don't feel normal. You feel you're not a real woman ." ² Still, her faith was relentless, "You ought to accept what they [doctors] say but something inside me all the time was telling me they were wrong." ² Lesley and John's determination emphasizes the importance of pushing science forward. Through a mother's love, a powerful partnership, exhaustive research, and a little bit of luck...the Browns, Edwards, and Steptoe tackled infertility giving birth to a whole new status quo. Louise Joy Brown is aptly named, as the name Louise means "warrior" ²¹— the success of her birth led the battle against infertility and delivered *joy* to millions of families across the world.

² Dow, K. (2018).

¹⁷ ClinicalMedicine (2023). The current status of IVF: are we putting the needs of the individual first?. *EClinicalMedicine*, 65, 102343. <https://doi.org/10.1016/j.eclinm.2023.102343>

²¹ Whelehan, A. (2025, March 7). *Louise*. Baby Name Meaning, Origin and Popularity. <https://www.thebump.com/b/louise-baby-name>