

Albert William Liley (1929-1983) ^[1]

By: O'Connor, Kathleen Keywords: [Biography](#) ^[2] [Fetus](#) ^[3] [Medical procedures](#) ^[4]

Albert William Liley advanced the science of fetal physiology and the techniques of life-saving *in utero* blood transfusions for fetuses with [Rh incompatibility](#) ^[5], also known as hemolytic disease. Due to his advances, fetuses too young to survive premature delivery, and likely to die *in utero* if their Rh incompatibilities were left untreated, were successfully transfused and carried to term. Liley was as passionate as a clinician and researcher as he was about his views on the rights of the unborn.

Liley was born in 1929. His mother was Zilla Jean Cook and his father was Albert Harvey Liley, a painter. He studied at and in his senior year Liley won the New Zealand National Scholarship. Liley loved forestry as much as science, and though some accounts indicate that Liley studied forestry for a period of time, he ultimately studied pre-medicine at [Auckland University](#) ^[6] College, University of New Zealand, starting in 1948. He earned his undergraduate degree in 1951. He then studied medicine on the South Island of New Zealand at the [University of Otago](#) ^[7] in Dunedin. During his required research year at medical school, Liley worked with Australian Nobelist [John Eccles](#) ^[8], the Chair of Physiology at . Their research focused on the successful measurement of mammalian neuromuscular transmissions.

In 1953 Liley married [Helen Margaret Irwin Hunt](#) ^[9], a classmate at who later became an obstetrician and pediatrician. Liley and his wife shared strong views on the rights and care of the [fetus](#) ^[10] and those views blended between their personal and public lives. In their years together they had three daughters, two sons, and adopted a daughter with Down's syndrome. Liley and his wife shared their love of the outdoors with their family at their 88 hector property, which was 250 kilometers south of . On that property, Liley experimented on forestry improvements, influenced forestry development in , and inspired his eldest son, Bill Liley Jr., into career in forestry.

Liley graduated from The [University of Otago](#) ^[7] in 1954 with his medical degree, but he did not enter an internship or residency program. Instead, he accepted a two year research scholarship at [Australian National University](#) ^[11] (ANU) in . Eccles had returned to to become a Professor of Physiology at that same university. Liley earned a PhD from ANU with Eccles as his advisor in 1956. By then Liley had published four papers on neuromuscular cell physiology. Liley and his wife returned to where Liley had a two year Sandoz research fellowship at the [Auckland Postgraduate School of Obstetrics and Gynecology](#) ^[12] with [Harvey M. Carey](#) ^[13]. Liley earned his diploma in Obstetrics in 1962.

In 1965, Liley took sabbatical leave to research at the Department of Obstetrics and Gynecology at [Columbia University](#) ^[14] College of Physicians and Surgeons, . He worked with [Vincent Freda](#) ^[15] and [Karliss Adamsons](#) ^[16], both obstetricians and researchers in reproductive and fetal medicine. The three men, with their combined knowledge of physiology, [neurology](#) ^[17], obstetrics, fetal medicine, and surgical techniques, collaborated on interventions

for medically compromised fetuses.

The collaboration continued when Liley returned in 1966 to The National Women's Hospital in where he was the New Zealand [Medical Research Council](#) [18] Senior Research Fellow in Obstetrics until 1969. The hospital and its affiliated postgraduate school provided care to women with high risk pregnancies from all over and the South Pacific. It was at that Liley and a team of fellow researchers focused on the prevention and eradication of [Rh incompatibility](#) [5]. Others involved in the research were [Florence Fraser](#) [19], an obstetrician, [Ross Howie](#) [20], a pediatrician, [Graham Liggins](#) [21], an obstetrician with expertise in fetal physiology, [Sally Kinnock](#) [22], a researcher, [Herb Green](#) [23], a clinical researcher and [Neal Patterson](#) [24], another obstetrician.

The [Rhesus factor](#) [25], shortened to Rh, is named after the rhesus monkeys on which the original Rh research was done. The factor is a protein which provides a thin chemical coating surrounding the red blood cell. About eighty-five percent of people have that protein, and are called Rh-positive. People with partial or no Rh protein on their red blood cells are called Rh-negative. People with Rh-negative blood cannot tolerate exposure to Rh-positive blood. If a pregnant woman is Rh-negative and her [fetus](#) [10] is Rh-positive, the woman's immune system creates antibodies against the fetus's blood. The antibodies filter across the [placenta](#) [26] to the [fetus](#) [10] and destroy the fetus's red blood cells. The fetal blood cells then produce at an accelerated rate to replace the blood cells destroyed by the maternal antibodies, but the cells only partially form due to their rapid production. Those partially formed cells are called erythroblasts to differentiate them from normal or fully formed red blood cells, called erythrocytes. The production of erythroblasts leads to [anemia](#) [27], [jaundice](#) [28], erythroblastosis, and often the death of the [fetus](#) [10] or newborn.

Prior to World War II, if an Rh-negative woman produced antibodies in response to Rh-incompatibility in one [pregnancy](#) [29], she carried the antibodies for the rest of her life. For all of her later pregnancies, if the fetuses were Rh-positive, they were at risk for [anemia](#) [27] due to [Rh incompatibility](#) [5]. Prevention and treatment of [Rh incompatibility](#) [5] in fetuses required an understanding of the mechanisms of immunology.

Liley began his research on [Rh incompatibility](#) [5] in the early 1960s by becoming proficient in the technique of amniocentesis. He believed that testing the amniotic fluid was actually testing the [fetus](#) [10] and its environment. Liley was sure that amniocentesis was the most accurate way to assess the course of the hemolytic disease in Rh-impaired fetuses. Repeated tests of the amniotic fluid, along with other with other measurements, indicated whether the condition was stationary or whether [anemia](#) [27] was worsening, and if so, if doctors had to induce labor.

A geneticist visiting the National Women's Hospital in the early 1960s told Liley and the research team that when she put normal blood cells into the abdomens (peritoneums) of neonates and infants who were homozygous for sickle cell, the neonates rapidly absorbed the cells in large quantities. Normal cells were then in the peritoneums, inspiring Liley and team to do the same with blood transfusions to fetuses with [Rh incompatibility](#) [5].

In 1963 Liley aided the [fetus](#) [10] of a woman reported as Mrs. E. McLeod. Her first [pregnancy](#) [29] had been successful, but her second ended in intrauterine death and the third resulted in stillborn twins. She was on her fourth [pregnancy](#) [29]. The [fetus](#) [10] had hemolytic disease and would likely die within a week. Liley had attempted, and failed, three previous fetal transfusions on fetuses from different mothers. With the knowledge he had gained from those

attempts, he realized that McLeod's [fetus](#) [10] might need multiple transfusions before birth, as well as a transfusion after birth, to survive. For McLeod's [fetus](#) [10], Liley gave it a transfusion *in utero* and post birth. This time the fetal transfusion was a success.

At the time, fetal transfusions were novel. *The New Zealand Herald* ran headlines such as "Pre-birth Transfusion Saves Baby Boy?", and "Baby Makes Headlines Over World?", which brought people from all over the world, patients and physicians alike, to inquire and request Liley's expertise in [Rh incompatibility](#) [5] and the new treatment.

The range of success of the transfusion treatment in the first few years was only about 39 percent. That range reflected the experimental status of the treatment. Needle penetration of the [uterus](#) [30] was a precarious procedure, even under x-rays and hands-on examinations. The [fetus](#) [10] shifted, as did the woman, for different reasons, and when the needle missed the fetal peritoneal cavity, the risk of puncturing a fetus' body part or rupturing the [amniotic sac](#) [31] was high. In some of Liley's surgeries, he had to insert needles two, three, or four times, especially with young fetuses where it was more difficult to perform the procedure accurately. Gradually, more fetal surgeons became involved with transfusion surgeries and the success rates increased.

Liley received international recognition for his work in fetal research and application of his bench science to the patient. He was elected a fellow of the Royal Society of New Zealand in 1965, and he obtained a chair in the Postgraduate School of Obstetrics and Gynecology at the [Auckland University](#) [6] Medical School in 1968. In 1971 he became a fellow of the Royal College of Obstetricians and Gynecologists and in 1978 [Pope Paul VI](#) [32] recognized Liley for his pro-life work. Though Liley was not a Catholic, the Pope made him a member of the [Pontifical Academy of Sciences](#) [33]. Liley was recognized as a Companion of the Order of St. Michael and St. George, received a British [knighthood](#) [34] in 1967, and in 1973 he received the title Knight Commander (of the Order) of St. Michael and St. George.

Liley's work focused on the [fetus](#) [10] and its life, improving the possibility of birth to fetuses with precarious beginnings. He believed that the [fetus](#) [10] was a person, whose impact on the [uterus](#) [30] was one where the [fetus](#) [10] was dominant, that the [fetus](#) [10] had rights over the mother, and that the [fetus](#) [10] deserved the same respect and consideration as adults

Both Liley and his wife were active anti-[abortion](#) [35] activists. He gradually became distressed that amniocentesis, which sometimes offers information about possible handicaps, became a tool for some parents to decide to abort. He also disliked that some doctors used the needle procedure he had pioneered for life-saving transfusions to administer saline for abortions. Liley, never quiet about his beliefs, formed the [Society for the Protection of the Unborn Child](#) [36] in 1970 in response to the creation of the pro-choice Abortion Law Reform Association. Liley addressed the US Supreme Court in 1974 for a case to determine whether [abortion](#) [35] infringed upon the constitutional rights of the unborn children. He also testified to the Royal Commission on Contraception, Sterilization and Abortion, New Zealand in 1977.

The public did not always respond well to the activist Liley, and the strain of his dual roles may have partly caused him to end his life on 15 June 1983, at age 54. At his funeral, officiated by both the Roman Catholic and the Anglican churches' highest leaders in New Zealand, at Auckland's Holy Trinity Cathedral, Liley was recognized for his great contribution to saving the lives of the unborn sick with new techniques, while living his life to protect all potential new lives.

Sources

1. ?Albert William Liley.? *New Zealand Medical Journal*. 96 (1983): 631-32.
2. ?Baby Makes Headlines Over World.? *The New Zealand Herald*, September 27, 1963, Front Page.
3. Casper, Monica J. ?*The Making of the Unborn Patient. A Social Anatomy of Fetal Surgery*.?London: Rutgers University Press, 1998
4. Hawgood, Barbara J. ?Professor Sir William Liley (1929?83): New Zealand Perinatal Physiologist,? *Journal of Medical Biography* 13 (2005): 82?8.
5. Harmon, Christopher R., ed. *Invasive Fetal Testing and Treatment*. Boston: Blackwell Scientific, 1995.
6. Liley, Albert William. ?Intrauterine Transfusion of Foetus in Haemolytic Disease.? *British Medical Journal* 5365 (1963): 1107-1109.
<http://www.bmj.com/content/2/5365/1107.full.pdf> ^[37] (Accessed May 3, 2011)
7. Liley, Albert William. ?The Technique of Foetal Transfusion in the Treatment of Severe Haemolytic Disease,? *Australia and New Zealand Obstetrics and Gynecology* 4 (1964):145-148.
8. ?Pre-birth Transfusion Saves Baby Boy.? *The New Zealand Herald*, September 24, 1963, Front page.
9. Rothschild, Joan. *The Dream of the Perfect Child*. Bloomington: [Indiana University](#) ^[38] Press, 2005.
10. ?Sir William Liley.? *British Medical Journal*. 287 (1983): 297.
<http://www.bmj.com/content/287/6387/297.full.pdf> ^[39] (Accessed May 3, 2011)

Albert William Liley advanced the science of fetal physiology and the techniques of life-saving in utero blood transfusions for fetuses with Rh incompatibility, also known as hemolytic disease. Due to his advances, fetuses too young to survive premature delivery, and likely to die in utero if their Rh incompatibilities were left untreated, were successfully transfused and carried to term. Liley was as passionate as a clinician and researcher as he was about his views on the rights of the unborn.

Subject

[Liley, Albert William](#) ^[40]

Topic

[People](#) ^[41] [Reproduction](#) ^[42]

Publisher

Arizona State University. School of Life Sciences. Center for Biology and Society. Embryo Project Encyclopedia.

Rights

© Arizona Board of Regents Licensed as Creative Commons Attribution-NonCommercial-Share Alike 3.0 Unported (CC BY-NC-SA 3.0) <http://creativecommons.org/licenses/by-nc-sa/3.0/>

Format

[Articles](#) ^[43]

Last Modified

Wednesday, September 25, 2013 - 15:53

DC Date Accessioned

Friday, May 25, 2012 - 15:45

DC Date Available

Friday, May 25, 2012 - 15:45

DC Date Created

2011-05-11

DC Date Issued

Friday, May 25, 2012

DC Date Created Standard

Wednesday, May 11, 2011 - 07:00

- [Contact Us](#)

© 2018 Arizona Board of Regents

- The Embryo Project at Arizona State University, 1711 South Rural Road, Tempe
Arizona 85287, United States
- 480.965.8927

Source URL: <http://embryo.asu.edu/pages/albert-william-liley-1929-1983>

Links:

- [1] <http://embryo.asu.edu/pages/albert-william-liley-1929-1983>
- [2] <http://embryo.asu.edu/keywords/biography>
- [3] <http://embryo.asu.edu/keywords/fetus>
- [4] <http://embryo.asu.edu/keywords/medical-procedures>
- [5] <http://embryo.asu.edu/search?text=Rh%20incompatibility>
- [6] <http://embryo.asu.edu/search?text=Auckland%20University>
- [7] <http://embryo.asu.edu/search?text=University%20of%20Otago>
- [8] <http://embryo.asu.edu/search?text=John%20Eccles>
- [9] <http://embryo.asu.edu/search?text=Helen%20Margaret%20Irwin%20Hunt>
- [10] <http://embryo.asu.edu/search?text=fetus>
- [11] <http://embryo.asu.edu/search?text=Australian%20National%20University>
- [12] <http://embryo.asu.edu/search?text=Auckland%20Postgraduate%20School%20of%20Obstetrics%20and%20Gynecology>
- [13] <http://embryo.asu.edu/search?text=Harvey%20M.%20Carey>
- [14] <http://embryo.asu.edu/search?text=Columbia%20University>
- [15] <http://embryo.asu.edu/search?text=Vincent%20Freda>
- [16] <http://embryo.asu.edu/search?text=Karliss%20Adamsons>
- [17] <http://embryo.asu.edu/search?text=neurology>
- [18] <http://embryo.asu.edu/search?text=Medical%20Research%20Council>
- [19] <http://embryo.asu.edu/search?text=Florence%20Fraser>
- [20] <http://embryo.asu.edu/search?text=Ross%20Howie>
- [21] <http://embryo.asu.edu/search?text=Graham%20Liggins>
- [22] <http://embryo.asu.edu/search?text=Sally%20Kinnock>
- [23] <http://embryo.asu.edu/search?text=Herb%20Green>
- [24] <http://embryo.asu.edu/search?text=Neal%20Patterson>
- [25] <http://embryo.asu.edu/search?text=Rhesus%20factor>
- [26] <http://embryo.asu.edu/search?text=placenta>
- [27] <http://embryo.asu.edu/search?text=anemia>
- [28] <http://embryo.asu.edu/search?text=jaundice>
- [29] <http://embryo.asu.edu/search?text=pregnancy>
- [30] <http://embryo.asu.edu/search?text=uterus>
- [31] <http://embryo.asu.edu/search?text=amniotic%20sac>
- [32] <http://embryo.asu.edu/search?text=Pope%20Paul%20VI>
- [33] <http://embryo.asu.edu/search?text=Pontifical%20Academy%20of%20Sciences>
- [34] <http://embryo.asu.edu/search?text=knighthood>
- [35] <http://embryo.asu.edu/search?text=abortion>
- [36] <http://embryo.asu.edu/search?text=Society%20for%20the%20Protection%20of%20the%20Unborn%20Child>
- [37] <http://www.bmj.com/content/2/5365/1107.full.pdf>
- [38] <http://embryo.asu.edu/search?text=Indiana%20University>
- [39] <http://www.bmj.com/content/287/6387/297.full.pdf%20>
- [40] <http://embryo.asu.edu/library-congress-subject-headings/liley-albert-william>
- [41] <http://embryo.asu.edu/topics/people>
- [42] <http://embryo.asu.edu/topics/reproduction>
- [43] <http://embryo.asu.edu/formats/articles>