John Chassar Moir (1900–1977) [1]

By: Haskett, Dorothy Ciardullo, Patsy Keywords: fistulas [2]

John Chassar Moir lived in the UK during the twentieth century and helped develop techniques to improve the health of pregnant women. Moir helped to discover compounds that doctors could administer to women after childbirth to prevent life-threatening blood loss. Those compounds included the ergot alkaloid called ergometrine, also called ergonovine, and d-lysergic acid beta-propanolamide. Moir tested ergometrine in postpartum patients and documented that it helped prevent or lessen postpartum hemorrhage in women. Moir also developed methods to treat tears between the bladder and the vagina [3], called vesico-vaginal fistulas, that occur due to complications of childbirth, and that cause urinary incontinence in women who have them.

Moir was born in the county of Angus, Scotland, on 21 March 1900, the fourth and youngest child to Isabella Pirie and John Moir. In Angus, the younger Moir grew up in the coastal town of Montrose. His father was a wine merchant who owned a grocery store called William Moir and Sons. Moir studied science and German language during his education at the Montrose Academy in Angus. Moir studied medicine and received his Bachelor of Medicine (MBBS) and Bachelor of Surgery (MBChB) in 1922 from the University of Edinburgh [4] in Edinburgh, Scotland.

After receiving his degrees, he studied abroad in Vienna, Austria, and in Berlin, Germany, where he continued his study of German, and at the Johns Hopkins Hospital [5] in the United States. Moir became a Fellow of the Royal College of Surgeons of Edinburgh in 1926, and he received his MD in 1930 from University of Edinburgh [4] for his thesis "Internal Rotation." He married Grace Hilda Bailey in 1933 and they had four children, two boys, and two girls.

Moir began to study obstetrics while at the John Hopkins Hospital in Baltimore, Maryland. He studied fistulas and met professionals at Johns Hopkins Hospital [5] who adhered to the principles of a mid-nineteenth century US surgeon, James Marion Sims [6]. Fistulas are a complication often of childbirth. A fistula is a hole that develops between the vagina [3] and the bladder or the vagina [3] and the rectum of the mother, causing waste fluids to leak into the vagina [3]. Fistulas sometimes occur after several childbirths or after a traumatic childbirth. Sims had developed a surgical technique for the repair of vesico-vaginal fistula in Alabama and in New York during the 1880s. Moir later credited Guy LeRoy Hunner and Stephen Cullen, professors at Johns Hopkins Hospital [5], with showing him how to perform Sims's techniques during the 1920s and early 1930s.

In the early 1930s, Moir at theUniversity College [7] Hospital in London, England, developed medical treatments for preventing postpartum bleeding in women who had just given birth. Since at least the sixteenth century, some midwives had used small doses of ergot of rye (*Claviceps purpurea* [8]), a poisonous dark purple fungus that affects the grain in rye plants, to produce strong uterine contractions. In the early nineteenth century physicians in the US had observed that fresh powdered ergot produced contractions of the uterus [9].

In 1904, pharmaceutical manufacturer Henry Wellcome in England and his team had aimed to describe the chemical composition of ergot fungus. Wellcome hired Henry Dale, who in 1936 received the Nobel Prize in Physiology or Medicine for his work on neurotransmitters, and Harold Dudley for the task. Later in 1906, Dale recruited George Barger, and the team isolated a crystalline solid from an extract of ergot. They assumed that it was a pure alkaloid and they called it ergotoxine. In 1917 Sandoz Pharmaceuticals in Basel, Switzerland, started to research ergot alkaloids. Sandoz hired Arthur Stoll, and in 1918 he isolated and patented the alkaloid called ergotamine from ergot extract.

As Moir worked in obstetrics, he could conduct clinical research on ergot compounds because the hospital already administered ergotamine, the Sandoz drug, to women who experienced excessive hemorrhaging after giving birth. Moir conducted experiments in the early 1930s at the University College [7] Hospital in London. He measured the pressure within uteruses with an apparatus he designed, and he documented the effects of drugs on contractions of women's uteruses one week after they gave birth.

Moir's equipment included a water-filled rubber balloon placed in the uterus [9] of a seven-day postpartum woman. It also included a water manometer, which recorded the amount of water in the balloon. He conducted his tests and kept the equipment in a small room adjacent to the maternity ward. For his first experiments Moir tested ergotoxine and ergotamine on uterine contractions. Compared to crude liquid of ergot, both ergotoxine and ergotamine were much slower to induce contractions. Moir's results demonstrated that neither drug was as effective in stopping post-birth hemorrhaging in women as the crude liquid form of ergot.

In 1932, Moir contacted Dale, who studied ergot of rye, and worked closely with him and Dudley to discover the active ingredient in powdered ergot that caused uterine reactions. In 1935, Dudley and Moir isolated a closely related substance, which they called ergometrine. Based on Moir's observations and experiments on post-partum women, it was the active alkaloid of ergot.

Dale's earlier claims that ergotoxine was a pure alkaloid were later disconfirmed by the findings of Author Stoll and Albert Hofmann at Sandoz Pharmaceutical, who in 1943 proved that ergotoxine was not a pure alkaloid but a mixture of three closely related alkaloids: ergocristine, ergocornine, and ergocryptine.

In 1935, Moir became a reader, an academic position based on research and scholarship, in obstetrics and gynecology in the British Postgraduate Medical School in Hammersmith in West London, England. That year, Moir and Dudley published the outcome of their work and collaboration in a paper titled "The Substance Responsible for the Traditional Clinical Effect of Ergot." In the paper, they detail how the orally administered drug needed to take effect immediately.

After his research about the properties of ergometrine, Moir returned to the study of vesico-vaginal fistulas. Moir conducted fistula research after he became professor at the University of Oxford in Oxford, England, in 1937, a position he held until his retirement in 1967. In a 1940 article Moir discussed the importance of Sims's method to treat fistulas, its impact on medical practice, and suggestions for improvement. He remarked that because of the improvement in obstetrics as a field, fistulas had become a medical curiosity in developed countries. Moir criticized common practices in treatment for what had become the rare occurrence of fistulas in the western world.

Surgeons avoided implementing Sims's technique because of its time-consuming nature and difficulty of performing the procedure. Moir opposed the then common practice of transplanting the woman's incontinent ureter to the colon, because while it was an easier surgery, it did not repair the fistula. In the 1950s Moir's colleagues, Reginald and Catherine Hamlin worked in Ethiopia and confronted an overwhelming number of cases of obstetric fistulas. They contacted Moir because of his article on Sims's technique for the repair of fistulas and his experience with surgical repair of obstetric fistulas.

In 1949, Moir joined John Martin Munro Kerr as author of the fifth edition of the textbook *Operative Obstetrics*, the first edition published by Munro Kerr as *Operative Midwifery* in 1908. After Munro Kerr's death, Moir was the sole author of the 1956 sixth and 1964 seventh editions. Moir revisited the subject of the significance of ergot in a 1955 article.

Throughout his life, Moir received many awards and recognitions for his work. In 1936, he became a Fellow of the Royal College of Surgeons Edinburgh, Scotland (FRCSED) and he became Commander of the Order of the British Empire (CBE) in 1961. He died on 24 November 1977, at Oxfordshire, United Kingdom, and was buried in the ancestral grave at Sleepyhillock Cemetery in Montrose, Scotland.

Sources

1. Barger, George, and Henry Hallett Dale. "CCLXV.—4–β–Aminoethylglyoxaline (β-iminazolylethylamine) and the other Active Principles of Ergot." *Journal of the Chemical Society* Transactions 97 (1910): 2592–5.
2. Baskett, Thomas F., Andrew A. Calder, Sabaratnam Arulkumaran, and John Martin Munro Kerr. *Munro Kerr's Operative Obstetrics 12th Edition*. Philadelphia: Elsevier Saunders, 2014.
3. Chamberlain, Geoffrey. *Special Delivery: The Life of the Celebrated British Obstetrician William Nixon*. London: Royal College of Obstetricians and Gynaecologists, 2004.
4. Chamberlain, Geoffrey. *From Witchcraft to Wisdom: A History of Obstetrics and Gynaecology in the British Isles*. London: RCOG, 2007.
5. Dale, Henry H. "On Some Physiological Actions of Ergot". *The Journal of Physiology* 34 (1906): 163–206. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1465771/ [10] (Accessed December 8, 2015).
6. Dudley, Harold Ward. "Ergometrine." *Proceedings of the Royal Society of London. Series B, Biological Sciences* 118 (1935): 478–84. http://rspb.royalsocietypublishing.org/content/royprsb/118/810/478.full.pdf [11] (Accessed February 11, 2017).
7. Dudley, Harold Ward, and John Chassar Moir. "The Substance Responsible for the Traditional Clinical Effect of Ergot." *British Medical Journal* (1935): 520–3. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2459740/pdf/brmedj07561-0006.pdf [12] (Accessed February 11, 2017).
8. Dunn, Peter M. "John Chassar Moir (1900-1977) and the Discovery of Ergometrine." *Archives of Disease in Childhood - Fetal and Neonatal Edition* 87 (2002): 152–54. http://fn.bmj.com/content/87/2/F152.long [13] (Accessed December 8, 2015).
9. Hamlin, Catherine, and Gwen B. Turnbull. "The Treatment of Rectovaginal and Vesicovaginal Fistulas in Women with Childbirth Injuries in Ethiopia." *Journal of Wound, Ostomy, and Continence Nursing* 24 (1997): 187–9.
10. Hamlin, Reginald H. J., and Catherine Nicholson. "Reconstruction of Urethra Totally Destroyed in Labour." *British Medical Journal* 147 (1969): 1248–50. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1982971/ [14] (Accessed December 8, 2015).
11. Kerr, John Martin Munro. *Operative Midwifery*. New York: William Wood & Company, 1911. https://archive.org/details/operativemidwife00munr [15] (Accessed December 8, 2015).
12. Kerr, John Martin Munro and John Chassar Moir. *Operative Obstetrics: A Guide to the Difficulties and Complications of Obstetric Practice*. London: Baillière, Tindall and Cox, 1956.
13. Loudon, Irvine. "Moir, (John) Chassar (1900–1977)." *Oxford Dictionary of National Biography*. Henry Colin Gray Matthew and Brian Harrison (Eds.) Oxford: Oxford University Press, 2004. Online edition. Ed. Lawrence Goldman.
14. Lee, M. Robert. "The History of Ergot of Rye (Claviceps Purpurea) II: 1900–1940." *The Journal of the Royal College of*

Physicians of Edinburgh 39 (2009): 365–9. http://www.rcpe.ac.uk/sites/default/files/lee_2.pdf [16] (Accessed December 8, 2015).
15. Moir, John Chassar. "The Cause of Internal Rotation of the Foetus with Special Reference to the Occipito Posterior–Position." *An International Journal of Obstetrics & Gynaecology* 36 (1939): 84–97.
16. Moir, John Chassar. "J. Marion Sims and the Vesico-vaginal Fistula: Then and Now." *British Medical Journal* 2 (1940): 773–8. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2179954/ [17] (Accessed December 8, 2015).
17. Moir, John Chassar. "The History and Present-Day Use of Ergot." *Canadian Medical Journal* 75 (1955): 727–34. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1825855/ [18] (Accessed December 8, 2015).
18. Moir, John Chassar. *Munro Kerr's operative obstetrics*. London: Baillière, Tindall and Cox, 1956.
19. Moir, John Chassar. *Operative obstetrics, 7th Edition*. London: Baillière, Tindall and Cox, 1964.
20. "Papers of Professor John Chassar Moir (1922–1973)." Summary. Archives Hub. http://archiveshub.ac.uk/data/gb1538-s2 [19] (Accessed December 8, 2015).
21. Schiff, Paul. "Ergot and Its Alkaloids." *American Journal of Pharmaceutical Education* 70 (2006): 98. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1637017/pdf/ajpe98. pdf [20] (Accessed December 8, 2015).
22. Sims, James Marion. "On the Treatment of Vesico-Vaginal Fistula." *The American Journal of the Medical Sciences* 45 (1852): 59–82. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2179954/pdf/brmedj04122-0003.pdf [21] (Accessed December 8, 2015).
23. Stoll, Arthur. Sandoz Ltd., Swiss Patent 79,879 (1918).
24. Stoll, Arthur. Sandoz Ltd., German Patent 357,272 (1922).
25. Stoll, Arthur, and Hofmann Albert. "Partialsynthese von Alkaloiden vom Typus des Ergobasins (Partial Synthesis of Alkaloids of the Type of Ergobasins)." *Helvetica Chimica Acta* 43 (1943): 944–65.
26. Stoll, Arthur, and Hofmann Albert. "The Ergot Alkaloids." In Richard H. F. Manske (ed.) *Alkaloids: Chemistry and Physiology Vol. 8*, 725–83. London: Academic Press, 1965.

John Chassar Moir lived in Scotland during the twentieth century and helped develop techniques to improve the health of pregnant women. Moir helped to discover compounds that doctors could administer to women after childbirth to prevent life-threatening blood loss. Those compounds included the ergot alkaloid called ergometrine, also called ergonovine, and d-lysergic acid beta-propanolamide. Moir tested ergometrine in postpartum patients and documented that it helped prevent or manage postpartum hemorrhage in women. Moir also developed methods to treat tears between the bladder and the vagina, called vesico-vaginal fistulas, that occur due to complications of childbirth, and that cause urinary incontinence in women who have them.

Subject

Moir, John Chassar, 1900-1977 [22] Obstetrics [23] Pregnancy [24] Ergot alkaloids [25] Hemorrhage [26] Vagina [27] Fistula, Vesico-vaginal [28] Urinary incontinence [29] University of Edinburgh [30] Johns Hopkins University [31] Royal College of Surgeons of Edinburgh [32] Ergot [33] Claviceps purpurea [34] Hall, Henry Dale, 1949- [35] Sandoz Pharmaceuticals Corporation [36] University College Hospital (London, England) [37] Sims, J. Marion (James Marion), 1813-1883 [38] Obstetrics [39]

Topic

People [40] Reproduction [41] Disorders [42]

Publisher

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

Rights

Format

Articles [43]

Last Modified

Wednesday, July 4, 2018 - 04:40

DC Date Accessioned

Sunday, February 12, 2017 - 01:10

DC Date Available

Sunday, February 12, 2017 - 01:10

DC Date Created

2017-02-11

DC Date Created Standard
Saturday, February 11, 2017 - 07:00

- Contact Us

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

---

Source URL: https://embryo.asu.edu/pages/john-chassar-moir-1900-1977

Links
[1] https://embryo.asu.edu/pages/john-chassar-moir-1900-1977
[2] https://embryo.asu.edu/keywords/fistulas
[3] https://embryo.asu.edu/search?text=vagina
[4] https://embryo.asu.edu/search?text=University%20of%20Edinburgh
[5] https://embryo.asu.edu/search?text=Johns%20Hopkins%20Hospital
[6] https://embryo.asu.edu/search?text=James%20Marion%20Sims
[7] https://embryo.asu.edu/search?text=University%20College
[8] http://eol.org/pages/1029583/overview
[9] https://embryo.asu.edu/search?text=uterus
[10] http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1465771/
[11] http://rspb.royalsocietypublishing.org/content/royprsb/118/810/478.full.pdf
[12] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2459740/pdf/brmedj07561-0006.pdf
[13] http://fn.bmj.com/content/87/2/F152.long
[14] http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1982971/
[15] https://archive.org/details/operativemidwife00munr
[16] http://www.rcpe.ac.uk/sites/default/files/lee_2.pdf
[17] http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2179954/
[18] http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1825855/
[19] http://archiveshub.ac.uk/data/gb1538-s2
[20] http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1637017/pdf/ajpe98.
		pdf
[21] http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2179954/pdf/brmedj04122-0003.pdf
[22] https://embryo.asu.edu/library-congress-subject-headings/moir-john-chassar-1900-1977
[23] https://embryo.asu.edu/library-congress-subject-headings/obstetrics
[24] https://embryo.asu.edu/library-congress-subject-headings/pregnancy
[25] https://embryo.asu.edu/library-congress-subject-headings/ergot-alkaloids
[26] https://embryo.asu.edu/library-congress-subject-headings/hemorrhage
[27] https://embryo.asu.edu/library-congress-subject-headings/vagina
[28] https://embryo.asu.edu/library-congress-subject-headings/fistula-vesico-vaginal
[29] https://embryo.asu.edu/library-congress-subject-headings/urinary-incontinence
[30] https://embryo.asu.edu/library-congress-subject-headings/university-edinburgh
[31] https://embryo.asu.edu/library-congress-subject-headings/johns-hopkins-university
[32] https://embryo.asu.edu/library-congress-subject-headings/royal-college-surgeons-edinburgh
[33] https://embryo.asu.edu/library-congress-subject-headings/ergot
[34] https://embryo.asu.edu/library-congress-subject-headings/claviceps-purpurea
[35] https://embryo.asu.edu/library-congress-subject-headings/hall-henry-dale-1949
[36] https://embryo.asu.edu/library-congress-subject-headings/sandoz-pharmaceuticals-corporation
[37] https://embryo.asu.edu/library-congress-subject-headings/university-college-hospital-london-england
[38] https://embryo.asu.edu/library-congress-subject-headings/sims-j-marion-james-marion-1813-1883
[39] https://embryo.asu.edu/medical-subject-headings/obstetrics
[40] https://embryo.asu.edu/topics/people
[41] https://embryo.asu.edu/topics/reproduction
[42] https://embryo.asu.edu/topics/disorders
[43] https://embryo.asu.edu/formats/articles