Leonard Colebrook (1883–1967) [1]

By: Shaikh, Safiya Keywords: Leonard Colebrook [2]

Leonard Colebrook was a physician who researched bacteria and infections in England during the twentieth century. In 1936, Colebrook deployed the antibiotic Prontosil to treat puerperal fever, a disorder that results from bacterial infections in the uterine tracts of women after childbirth or abortions. Colebrook also advanced care for burn patients by advocating for the creation of burn units in hospitals and by using antisepsis medication for burn wound infections. Colebrook's work on treatments for puerperal fever reduced cases of puerperal fever throughout the world.

Colebrook was born in Guildford, England, on 2 March 1883 to Mary Gower and May Colebrook. He was the second youngest of thirteen children. Colebrook's father was married twice and had seven children prior to marrying Colebrook's mother. Colebrook attended grammar school in Guildford, England, from 1891 to 1896. He then continued on to Westbourne High School in Bournemouth, England. According to Zachary Cope, Colebrook's later colleague, Colebrook grew up in a traditional, Christian household, and his father was involved in social work throughout Guildford.

After high school, Colebrook attended Christ's College in Blackheath, England, in 1899. A year later, he completed his premedical studies at London Hospital [3] Medical College in London, England. Colebrook then received a scholarship to enroll at St. Mary's Hospital Medical School in London. According to Cope, a physician and teacher at St. Mary's Hospital, Colebrook was a soft-spoken and hardworking student. In 1906, Colebrook graduated with a Bachelor of Medicine and a Bachelor of Surgery from St. Mary's Hospital Medical School.

Prior to working on a treatment for puerperal fever, Colebrook worked on a variety of infectious diseases around the world. Graham Wilson, a colleague of Colebrook's in England, stated that Colebrook planned to work as a medical missionary after he completed his medical education. However, in 1907, St. Mary's Hospital selected Colebrook to serve under Almroth Wright in the Inoculation Department. From 1907 to 1912, Colebrook and Wright used vaccines to treat infectious diseases, specifically tuberculosis. Tuberculosis is an infectious disease caused by bacteria that primarily affects the lungs, but it can also attack other parts of the body. At the time, there was no treatment for tuberculosis, which often killed patients.

In 1912, Colebrook and Wright went to Johannesburg, South Africa, to work with gold miners who caught pneumonia, an inflammatory condition in the lungs. Wright developed vaccines for pneumonia that greatly reduced the death rate from pneumonia among the gold miners. Paul Fildes, a pathologist and colleague of Wright and Colebrook, described their relationship as that of a father and son.

In the years after his time in Johannesburg, Colebrook worked on the treatment of pulmonary tuberculosis at St. Mary's Hospital. Pulmonary tuberculosis, often called phthisis during the early twentieth century, is tuberculosis that affects the lungs. Tuberculosis can cause cavities in lungs, causing them to collapse. Colebrook worked to treat cases of pulmonary tuberculosis with a surgical treatment in which surgeons inserting air or nitrogen in the chest to close tuberculosis cavities that result from the bacteria.

In 1914, at the beginning of World War I [4], the Royal Army Medical Corps of the British Army appointed Colebrook as Battalion Medical Officer to the Kensington Regiment and Captain in the Royal Army Medical Corps. The year, Colebrook married Dorothy Scarlett Campbell, a social worker who worked to improve healthcare. As Medical Officer and Captain, Colebrook first worked in St. Mary's Hospital, where he worked as a part of his military duties on dysentery, an infectious disease in which the intestines become inflamed, as well as on wound infections. In 1917, Colebrook joined the Wright's laboratory at No. 13 General Hospital in Boulogne, France. There, he treated wound infections and researched the bacterial aspects of gunshot wounds. Colebrook's work in the military made him prompted him to study skin grafts and bacterial symbioses, the processes by which different species of bacteria cooperate to their mutual benefit.

After finishing his work in the military and returning to London in 1918, Colebrook's mentor Wright encouraged him to work on puerperal fever. Puerperal fever occurs as a result of any bacterial infection in the uterine tract of a women following childbirth or abortion [5]. The infection generally occurs on surface of the interior of the uterus [6] after separation of the placenta [7] following childbirth or abortion [5], but the infection can originate in any part of the uterine tract. Patients with puerperal fever display high body temperatures during the days following birth.

During the mid-1800s, Ignaz Semmelweis, a physician in Hungary, found that using antiseptic solutions to clean the hands of doctors reduced cases of puerperal fever. Antiseptic cleaners prevented the growth of microorganisms on the skin of physicians, who then cannot pass the infectious microorganisms to patients, including women delivering babies. Physicians implemented Semmelweis's techniques for years after Semmelweis's death, though puerperal fever remained common through the early 1900s.

In 1925, healthcare administrators placed everyone in London with puerperal fever into specific municipal hospitals. Concentrating puerperal fever patients to designated hospitals enabled Colebrook to study both cases of puerperal fever and the hospital conditions. After studying the isolated hospitals, Colebrook noted that many hospitals did not follow Semmelweis's antiseptic procedures. In his initial research, Colebrook found that doctors washed their hands with soap, which failed to prevent cases of puerperal fever because it did not kill the bacteria.

Colebrook began to look for a different treatment for puerperal fever. Colebrook tried to develop a vaccine to prevent puerperal fever but found that vaccines were ineffective. He began to study antibiotics, and he demonstrated that the antibiotic chloroxylenol wasn't toxic to humans [8], and that it was effective against *Streptococci* [9], the bacteria that cause puerperal fever. Colebrook campaigned for doctors to use chloroxynol to sterilize maternity wards to prevent puerperal fever.

After encouraging hospitals to follow antiseptic procedures, Colebrook worked on finding a treatment for puerperal fever. In 1928, the Medical Research Council [10], a government research agency of UK in Swindon, UK, started a research project to find the specific bacteria that caused puerperal fever and to develop a cure. Colebrook led the group, which included several other students of Wright. He researched at Queen Charlotte's Hospital in London, England. Colebrook wife secured funding for the laboratory from the Rockefeller Foundation [11] in New York City, New York. The funding enabled scientists to collaborate between the Rockefeller Institute [12] and Colebrook's research group.

At the Rockefeller Institute [12], Rebecca Lancefield was serologically typing Group A hemolytic *Streptococci* bacteria. Serological typing is a technique that uses antibody-antigen reactions, the reactions between the antibodies of the white blood cells in people and the antigens of the bacteria, to identify pathogenic bacteria. Group A *Streptococci* bacteria are a type of bacteria that cause many bacterial illnesses in humans [8]. In London, after learning of Lancefield's work with Group A *Streptococci*, Colebrook and his team observed that the most advanced cases of puerperal fever were caused by Group A *Streptococci*. According to Colebrook, the finding that Group A Streptococci caused puerperal fever helped researchers to clarify many aspects of puerperal fever.

During his time at Queen Charlotte's Hospital, Colebrook collaborated with Fred Griffith of London's Ministry of Health Laboratory to compare different samples of the streptococcal bacteria. Griffith's work enabled Colebrook's team to learn which streptococci bacteria were harmful to humans [8]. In 1930, Colebrook's youngest sister, Dora Colebrook, joined him as a part of his research team. Using Griffith's streptococcal samples, she investigated sixty-three cases of puerperal fever. She observed that in two-thirds of the cases, the infecting streptococcal type was found in the respiratory tracts of people treating and caring for the patients, while in the remaining cases the bacteria was in the respiratory tracts of the patients. Colebrook's sister also observed cases in which the infecting bacterial type was found in both the respiratory tract of the person attending to the patient and in the patient. Dora Colebrook's conclusions helped Colebrook's team show that the bacteria that caused puerperal fever traveled more often with the doctor as opposed to the patient. Colebrook concluded that the bacteria travelled from the birth attendant to the patient.

In 1935, Colebrook learned of the success of Prontosil in Germany as a cure for streptococcal infections. A research team at Bayer Laboratories in Frankfurt, Germany, developed and synthesized Prontosil. Colebrook and Maeve Kenny, a colleague of Colebrook's, began experiments on mice with the drug at Queen Charlotte's Hospital. Although the drug treated puerperal fever early in their experiment, Colebrook did not yet advocate for doctors to use Prontosil to treat puerperal fever. He next tested the drug on human patients, for which the team concluded that the drug effectively treated puerperal fever. In 1936, Colebrook and Kenny published the results of their experiments and clinical trials. With the use of Prontosil, the cases of death from puerperal fever became almost nonexistent throughout Europe and the US by the mid 1900s.

When World War II began in 1939, Colebrook returned to work for the British military. He went to France to monitor the use of sulfonamide medication, an antibacterial medication, in the war. In 1942, after the death of his wife, Colebrook directed the Medical Research Center Burn Unit at the Royal Infirmary in Glasgow, Scotland. Colebrook studied the control of infections from burns. A year later, in 1943, the Medical Research Center Burns Unit moved to Birmingham Accident Hospital in Birmingham, England. There, Colebrook established the practice of placing burn patients in sterile environments to reduce the risk of infections in burn wounds.

In 1946, after World War II ended, Colebrook, along with journalist Vera Scovell, campaigned for preventative measures to reduce burns. These measures included wearing clothing that was not flammable, as at the time many clothes in the UK were made of highly flammable fabrics. That year, Colebrook married Scovell. The two worked to garner publicity on the prevention of burns through newspaper articles and within the scientific community. In 1952, the UK Parliament in London passed the Fireguards Act. The Fireguards Act banned the sale of unguarded gas fire appliances, electric fire appliances, and oil heaters, all of which caused a large number of burn accidents. Colebrook continued to discuss the risks associated with open fires in living rooms and the harmful nature flammable clothing following the passage of the act.

In 1945 Colebrook's work earned him the title of Fellow of the Royal Society in London, a title given to select scientists and engineers in the United Kingdom. Colebrook also received the Blair Bell Medal in 1955, an award for researchers in reproductive sciences, and the Edward Jenner Medal in 1962, a distinction that the Royal Society of Medicine gives to distinguished epidemiological researchers. Colebrook died from a heart attack in Buckhamshire, England, on 27 September 1967.

Sources

1. Colebrook, Leonard. "Vaccine Therapy—its Administration, Value, and Limitations." *Proceedings of the Royal Society of Medicine* 3 (1910): 41.
2. Colebrook, Leonard. “Notes on Four Cases of Pthisis in which Artificial Pneumothorax was Induced.” *The Lancet* (1911): 150–3.
3. Colebrook, Leonard. “The Sterilization of the Hands.” *Interim Report of the Departmental Committee on Maternal Mortality and Morbidity*, 1930.
4. Colebrook, Leonard. “The Fireguards Act.” *The Lancet* (1953): 132–4.
5. Colebrook, Leonard, Gladwin A. H. Buttle, and R. A. Q. O'Meara. "The mode of action of paminobenzenesulphonamide and prontosil in haemolytic streptococcal infections." *The Lancet* (1936): 1323–6.
6. Colebrook, Leonard, and Méave Kenny. "Treatment of human puerperal infections, and of experimental infections in mice, with prontosil." *The Lancet* (1936): 1279–81.
7. Fildes, Paul. "A new medium for the growth of B. influenzae." *British Journal of Experimental Pathology* 1 (1920): 129.
8. Griffith, Fred. "Types of haemolytic streptococci in relation to scarlet fever." *Journal of Hygiene* 25 (1926): 385–97.
9. Lancefield, Rebecca C. "A serological differentiation [13] of human and other groups of hemolytic streptococci." *The Journal of experimental medicine* 57 (1933): 571–95.
10. Lowbury, Edward Jospeh. “Leonard Colebrook (1883–1967).” *British Medical Journal* 287 (1983): 1981–1983.
11. Nuland, Sherwin B. *The Doctor’s Plague: Germs, Childbed Fever, and The Strange Story of Ignaz Semmelweis*. New York: W.W Norton and Company, 2003.
12. Oakley, Cyril Leslie. “Leonard Colebrook.” *Biographical Memoirs of Fellows of the Royal Society* 17 (1971): 90–138.
13. Parker, Marler Thomas. “Pioneers in infection control: Leonard Colebrook and his family.” *Journal of Hospital Infection* 28 (1994): 81–90.
14. Semmelweis, Ignaz. "The etiology, concept, and prophylaxis of childbed fever." Buck C., Llopis A., Najera E., and Terris M. *The challenge of epidemiology. Issues and selected readings. Scientific Publication* 505 (1988): 46-59.

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Subject

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