

## Essay Contest 2016/17

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### A Great Mind

#### Charles Best

Ah, Canada, land in the north, home to the majestic beaver and the elegant moose. World's largest producer of maple syrup and winner of 26 ice-hockey world cups. Who could've thought that it also was residence to some of the brightest heads in history, brilliant minds, that came from abroad to flourish in this land? Like Sandford Fleming or Alexander Graham Bell, but I don't want to write about them today – today I want to write about Charles Best, who helped to invent and optimise the production of insulin.



First I will talk about his life and why he moved to Canada. Then I'll tell you how he got into working with insulin and how the discovery of insulin changed the world.

Charles Best was born on 27<sup>th</sup> February 1899 in the small town of West Pembroke, Maine, to his proud parents Luella Fisher and Herbert Huestis Best. He went to the C. H. Best West Elementary School in Burlington, Ontario, and later married Margaret Hooper Mahon in 1924. (1) (The Famous People n.d.) His first son, Henry Best grew up to become a well-regarded historian and later even became president of the Laurentian University in Sudbury. His second son, Charles Alexander Best, became a geneticist and politician. During his career as a scientist. (2) (Best, Henry B.M. Margaret and Charley 2003) Charles Best was awarded 18 honorary degrees from universities around the world and was elected a member of the Royal Netherlands Academy of Arts and Sciences as one of the few foreign members. In 1994 he was inducted into the Canadian medical hall of fame, and in 2004 in the National inventor's hall of fame. (3) (The Famous People, n.d.)

But how did his career start? Well, it all began with Frederick Banting, an unknown former frontline surgeon who wanted to change the way they treated patients suffering from

diabetes. One day he stumbled upon a tiny article in his local newspaper and this little event should change the world forever. (4) (Charles Wassermann, Insulin, 1991) Banting read about scientists, who experimented with the pancreases of dogs. They had discovered that dogs would produce the same kind of insulin as humans if their pancreas was stimulated the right way. As a consequence, Frederick Banting thought that maybe if he could remove the pancreases from hundreds of dogs and distill the insulin inside, he could save the lives of thousands of patients who were suffering from diabetes. (5) (Planet Wissen, Christiane Tovar 2013)

Banting wasn't very educated in chemistry and surgery, so he contacted John Mcleod, a world-renowned physiologist. From their very first meeting, Frederick and Mcleod weren't very copasetic. John Mcleod was a senior professor, very learned, Frederick Banting was a young guy who knew almost nothing about the things he wanted to talk about; but he knew how to convince McLeod to let him work with his students. (6) (Charles Wassermann, Insulin, 1991)

(Among ?) Mcleod's students were Clark Noble and Charles Best. Both wanted to work with Frederick Banting and so they tossed a coin; Charles won and years of studying and refining the methods of extracting insulin began. It was the year 1920, Best was 21 at that time, young, ambitious and looking forward to working with Banting. In 1921, Best came up with the idea of isolating the pancreas from the rest of the digestive system, so it would only produce pure insulin. The work was promising but there was a problem: They were quickly running out of dogs, and if they ran out of dogs, the research would stop. (7) (The Discovery of Insulin, Professor Michael Bliss, 2007)

Best had put all his savings in this project; if it failed, he'd have nothing left for his future life, so this had to work. Banting and Best were so desperate for animals that they even resorted to catching stray dogs on the streets. However, this makeshift solution went long enough for Best to come up with a new plan. (8) (The Discovery of Insulin, Professor Michael Bliss, 2007) They had to face that their original idea was too complicated. But they discovered that they could use removed pancreases from the slaughterhouse to extract the valuable insulin. The trouble was that it was maddeningly inconsistent; sometimes the extracts would have the blood sugar drop and sometimes nothing would happen at all. By Christmas of 1921, Best's

results were so inconsistent that they both knew they had to get help from others. (9) (The Discovery of Insulin, Professor Michael Bliss, 2007)

One of the challenges was giving the extract enough alcohol so that it was pure enough but still non-toxic for human consumption. So Mcleods hired another scientist, James Collip, who had a PhD in biochemistry and was all in all better suited for working with this fine chemical. Mcleods instructed him to not share his results with Best and Banton so that it would be a race who'd refine the extract faster for practical use in human trials. (10) (The Discovery of Insulin, McLellan & Stewart 1982.) But then, one day, when Charles Best had been working all day in his laboratory, failing again and again to produce a usable extract, working overtime as usual, he had just adjusted his microscope when he noticed that the substance he had produced (?) was clearer and somehow crisper than usual. He had made the world's first, pure, medical insulin extract. (11) (Doku. The Story of Insulin: Dr. Charles Best Discusses his Diabetes Discovery (London, UK 1959) minute 2:00) In the end, though, Charles Best was never credited for his work and had to watch Frederick Banting receive the Nobel price and knighthood. Best died on 31<sup>st</sup> March 1978, uncredited and nearly forgotten.(12) (Planet Wissen, Christiane Tovar 2013)

I chose to write about Charles Best because I think he was a great mind and achieved fantastic things in cooperation with his colleagues. Before the discovery of insulin, the usual treatment for patients who were suffering from diabetes was to feed them only about 400kcal per day in the form of soup, so they were literally starved to death. Best's discovery has changed the lives of thousands of diabetes patients forever and I feel terribly sorry that Charles Best's major role in this event was forgotten. He was a brilliant mind and I thank him for his work.

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