

Obituary

Charles Herbert Best 1899–1978

A. Marble

Joslin Diabetes Foundation, New England Deaconess Hospital, and Harvard Medical School, Boston, Massachusetts, USA



Dr. Charles H. Best at the First ADA Paramedical Postgraduate Course, April 1969, Boston, Massachusetts

Charles H. Best, co-discoverer of insulin and benefactor of mankind, died on March 31, 1978 at the Toronto General Hospital following surgery for repair of a ruptured aneurysm of the abdominal aorta. His passing was mourned throughout the world, particularly by millions of diabetic patients, their families and friends, as well as by investigators, physicians, and others interested in science and medicine. He and they were fortunate in that he was privileged to live a long and full life from the age of 22, when he and Banting did their initial work, until his death at 79. During the later decades of life, Best travelled extensively over the globe visiting friends and laboratories, giving generously of his time by participating in meetings of both professional and lay societies. He was almost invariably accompanied by his devoted and charming wife, Margaret, who had encouraged him and kept notes for him and Banting during the early days of their work. Charley and Margaret Mahon were married on September 3, 1924,

He had two sons, Charles Alexander (“Sandy”), a botanist, and Henry Bruce Macleod, an historian, and 7 grandchildren. Tragically, Sandy died at the early age of 46 of a heart attack 5 days before his father. Henry, the younger son, is President of Laurentian University in Sudbury, Ontario.

Charles Herbert Best was born on February 27, 1899 in West Pembroke, Maine, U.S.A., a village not far from the border of New Brunswick, Canada. Both parents were originally from Nova Scotia. His birthplace, a rambling clapboard house, was used not only as a home but also as an office by his father, Dr. Charles Best, who practiced general medicine in the West Pembroke area for 46 years. Under the leadership of Dr. Edwin W. Gates, the house was purchased in 1966 by friends and turned over to the American Diabetes Association. In 1978 it was proposed as a cultural resource to the U. S. National Trust for Historic Preservation. As such, it would be preserved and maintained indefinitely. Charley lived here until he finished High School, following which he entered the University of Toronto. At first he was enrolled in a general arts programme but after a war-time interlude in the Canadian Armed Forces, in 1919 he shifted to a course in physiology and biochemistry designed to prepare students for medical research and subsequently a medical degree. This, plus Best’s part-time research on diabetes in 1920, gave him special training in laboratory procedures which was invaluable in his cooperation with Frederick G. Banting in the summer of 1921 in their quest for a method of extracting a hypoglycaemic substance from the pancreas. It was fortuitous that at about that time methods were becoming available for the determination of sugar in small amounts of blood. Best often remarked that he had become interested in diabetes in large part because his father’s sister, a nurse, who had lived for some time with the Best family in West Pembroke, died in diabetic coma in 1918.

The story of the discovery of insulin has been told in detail so often that the present article will deal chiefly with items of general interest. The reader is

referred to the list of references for publications regarding his collaborators in the refinement of methods for insulin preparation, his role as Director of the Insulin Division of the Connaught Laboratories, the part played by Eli Lilly and Co., and other important matters of history.

The time it took Banting and Best to achieve their initial goal was amazingly short. They started work in the laboratories of the University of Toronto on May 17, 1921, the day after Best finished his fourth-year examinations. They began with Banting doing the surgery and Best the biochemistry but as time went on, each learned some of the other's methods and the research soon became a truly cooperative one. Despite an initial delay of six weeks due to technical difficulties, by July they had secured their first positive results. Using relatively crude extracts in totally depancreatized dogs, they achieved convincing decrease of blood sugar, clearing of sugar and ketone bodies from the urine, and much improvement in the clinical condition of the animals. On August 14 they saw, for the first time, hypoglycaemia develop in a diabetic dog following the intravenous injection of 30 cc of their extract. On November 14, 1921 they presented their results before the Physiological Journal Club at the University of Toronto and a month later at a meeting of the American Physiological Society at Yale University. Their now classical paper, "The internal secretion of the pancreas" was published in the February, 1922 issue of the *Journal of Laboratory and Clinical Medicine*. The first human diabetic patient to be treated with the new extract was Leonard Thompson, a 14-year-old boy who was given the first injection in the Toronto General Hospital on January 11, 1922. He lived thereafter for 11 years, dying then of bronchopneumonia following a motorcycle accident.

In 1925–26 Best spent about two years working in the laboratories of Dr. (later Sir) Henry Dale at the National Institute for Medical Research then at Hampstead in the north of London. Upon his return to Toronto, he was appointed Chairman of the Department of Physiological Hygiene (relinquishing this at the end of World War II) and, with the retirement of Professor J. J. R. Macleod in 1929 he was made Chairman of the Department of Physiology, a position he retained until 1965 when he became Professor Emeritus. Following Banting's death, he was made the Director of the Banting and Best Department of Medical Research. In World War II, he was Director of Medical Research for the Canadian Navy. Throughout his life, he retained an abiding interest in diabetes and insulin. However, he played a major role in the development of heparin, in the establishment of the importance of choline in nutri-

tion, and in knowledge regarding histamine. With N. B. Taylor, he wrote a widely used text book on physiology in addition to numerous scientific papers.

Charley and Margaret Best had a host of friends around the world who loved and admired them for their kindness, ease of manner, and willingness to give help when needed. Over the years he was showered with honours beginning with the telegram sent to colleagues by Banting in 1923 following the award of the Nobel Prize to him and Professor Macleod. In this he stated "... I ascribe to Best equal share in discovery. Will share with him". He was made a Companion of the Order of Canada and a Commander of the Order of the British Empire. He received honours from many countries including the King Haakon Liberty Cross and the U. S. Legion of Merit. He was awarded honorary degrees from many universities around the world. He was President of the American Diabetes Association in 1948-49 and thereafter, Honorary President. He was an Honorary President of the International Diabetes Federation since its formation and held honorary positions in many diabetes societies world-wide, including honorary life membership in the European Society for the Study of Diabetes. He was the first President of the International Union of Physiological Sciences.

The passing of Charley Best marks the end of a highly fruitful life. There are various concepts as to what constitutes immortality but certainly Best achieved such by helping to give health, happiness and longevity to millions of persons with diabetes, by his life-long activities in the education of the profession and the public, and by his genuine concern for his fellow human beings. All join in expressing sympathy to Margaret, her son Henry, and other members of the family. We, as well as they, will miss him. One is comforted, however, by the thought that his spirit lives on and will continue to stimulate investigators for many years to come.

References

1. Banting, F. G., Best, C. H.: The internal secretion of the pancreas. *J. Lab. Clin. Med.* **7**, 251–266 (1922)
2. Best, C. H.: The discovery of insulin. *Proc. Am. Diabetes Assoc.* **6**, 85–93 (1946)
3. Best, C. H.: Forty years of interest in insulin. *Br. Med. J.* **16**, 179–182 (1960)
4. Best, C. H.: Nineteen hundred twenty-one in Toronto. *Diabetes* **21** (Suppl. 2), 385–395 (1972)
5. Jackson, J. G. L.: Charles Herbert Best (Obituary). *IDF Bull.* **23**, 3–4 (1978)

A. Marble, M.D.
Joslin Diabetes Foundation Inc.
One Joslin Place
Boston, MA 02215
USA