

dial infarction to repair ischemic tissue. Hopefully this part will expand in future editions, because the regenerative potential of stem cells could be expanded to the repair of other tissues.

The book also contains interesting sociopoliticoeconomic considerations throughout. In particular, the varying adaptation of tyrosine kinase inhibitors for treatment of chronic myeloid leukemia instead of stem cell transplantation varies around the world, according to the economic status of each country. In countries with low economic status, stem cell transplantation remains the treatment of choice—even though oral tyrosine kinase inhibitors are available, their high cost and long-term use makes them prohibitively expensive in poorer countries compared with stem cell transplantation. In contrast, in countries with high economic status, the use of tyrosine kinase inhibitors is preferred to stem cell transplantation because of lower toxicity, easier administration, and avoidance of transplantation complications.

Hematopoietic Stem Cell Transplantation is a worthwhile and valuable reference text appropriate for clinicians and researchers alike, since it represents the most up-to-date and concise information in the field.

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THE DISCOVERY OF INSULIN: TWENTY-FIFTH ANNIVERSARY EDITION

By Michael Bliss
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EVERY SCHOOLCHILD IN CANADA—PARTICULARLY IN THE Toronto in which I grew up—knows that Banting and Best discovered insulin. Together at the University of Toronto, with very few resources and against terrific odds, they made a singularly great discovery that has saved the lives of millions over the years. But Michael Bliss, a renowned medical historian at this same university and biographer of both Osler and Cushing, debunks this myth and tells the true story in a most engaging manner. In fact, the book is so interesting and entertaining that it reads like a cross between a sober Greek tragedy and a riveting detective story.

Early on, Bliss explains that his work, as well as that of others, has exposed “the foolishness of believing that insulin was discovered by Banting and Best” (p 8). Pretty shocking stuff for someone brought up on the tales of these heroic Canucks. By the late 1970s, Bliss had gained access to Banting’s newly released papers. Furthermore, with the 1978



Frederick G. Banting, recipient of the Nobel Prize for the discovery of insulin. Photographer and date unknown. Reproduced courtesy of the National Library of Medicine, National Institutes of Health.

death of Best, the last surviving member of the team that discovered insulin, Bliss was free to describe the myriad complexities and nuances of this rather unique story. In Bliss’ opinion, while the Dominion of Canada’s dynamic duo were necessary to the process of discovery, they were definitely not sufficient. He explains that “Their work was part of the discovery of insulin. It was not the whole discovery. Banting and Best began the process that led directly and without significant interruption to success at Toronto. But it was a multi-stage or multi-step process, to which [their collaborators] Collip [and] Macleod, and perhaps others made vital contributions” (p 209).

This story provides an excellent case history of the twists and turns science (and scientists) so often take on the road to discovery and of how much ego, chance, accidents, wrong ideas, and wrong-headed behavior can influence the process—for better or for worse. For example, Banting’s original “great idea” that set him on the road to the discovery and isolation of insulin had to do with the concept of the results of pancreatic ligation. It was already known in the 1920s that a dog with its pancreas removed would quickly develop diabetes and die soon thereafter. But it was also known that the pancreas comprised 2 kinds of cells, those dealing with the exocrine function of digestion and those

that somehow regulated carbohydrate metabolism. Banting (and his student collaborator Charles Best, who won the job on a coin toss—a kind of endocrinological Ringo Starr to the Pete Best who lost) thought that by ligating the pancreatic ducts, the rest of the organ would atrophy but that the islet cells would not die. Furthermore, they thought that this mushed-up pancreatic increment (appropriately prepared and purified), when injected into the dogs, would “cure” their iatrogenic diabetes. This wonderful idea and much of the experimentation that followed turned out to be only partly correct. Bliss explains that only with the guidance and support of J. M. Macleod, professor of physiology at the university and director of the laboratory in which he invited Banting to work, as well as due to the collaboration of J. P. Collip, a talented biochemist on sabbatical at the time in Toronto, was it possible to get the work right. The tale recounts the arguments, the paranoia, the occasional bouts of alcoholism, the long-suffering patience on the part of Macleod, and even the occasional near fistfight in the old physiology building where I took some of my medical school classes.

Once again, proving the old adage that the best way to make an enemy is to do a neurotic a favor, Macleod’s support (real and essential, albeit never all that generous) helped the young physician develop a deep sense of hatred toward the older professor for the rest of his life. For example, when Banting was informed of the good news that he had won the Nobel Prize but also of the bad news that it was to be shared with Macleod, Banting at first actually wanted to renounce the honor. Bliss describes how an elderly woman who had witnessed the scene put it: “‘He was furious, oh he was furious,’ she repeated, clenching her fists. ‘He could have torn the whole building down. . . . Oh he was yelling and damning.’” It goes without saying that this kind of behavior in those days and in that place by a member of the establishment was not exactly first class.

Bliss writes well and with a terrific sense of humor. Reading this book brought many smiles and indeed several laugh-out-loud moments. For example, in describing Macleod’s relations with Banting, the author offers readers a perspective that could only have come from the True North, Strong and Free: “Professors usually have to bend a good deal in their relations with students, but even in these latter days of student power and teaching evaluations, there are limits. Some students are simply impossible to deal with. Macleod could have done better, perhaps, but only a superman could have led the untutored, insecure, bull-headed Banting through to insulin without major troubles. It would have been like going through a whole Canadian hockey season without allowing a single fist-fight” (p 211).

As alluded to above, this book was first published back in 1982. Why review it now? The publishers in their wisdom have decided to put out a 25th anniversary edition in which Bliss offers a new preface and a rewritten last chapter to bring the reader up to date with the ongoing tale of insulin. He also explains that writing the book and then revising it after having finished his magisterial works on Osler and Cushing, the crown princes of modern physick, had helped him “square the circle.” Unusually self-disclosing for an academic historian, Bliss points out that of all the books he has authored, this history is his favorite. For my part, I have read (and reviewed in these pages) the 2 fascinating biographies alluded to above. They were both terrific reads, but *The Discovery of Insulin* is to my mind the very Banting and Best of them all.

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