

## BOOK REVIEW

John Grant McLoughlin

*King of Infinite Space—Donald Coxeter, the Man Who Saved Geometry*

By Siobhan Roberts, House of Anansi Press, Toronto, 2006

ISBN 0-88784-201-1, hardcover, 480 pages, CDN\$36.95.

Reviewed by **Andy Liu**, University of Alberta, Edmonton, AB

This book is more than just a biography of the late Professor Coxeter. It is a veritable encyclopedia of geometry for the layman. I must state immediately and emphatically that the phrase “for the layman” is not intended to be derogatory, but high praise. Although I, as a professional mathematician, learned a lot by reading this book, the mathematical details are so well handled (sometimes in the Appendices) that I think the book could be read, absorbingly, by the general public. I welcome this book whole-heartedly as a fine, and all-too-rare, example of how to communicate mathematics effectively.

The subtitle of the book, “*the Man Who Saved Geometry*”, is rather bewildering to many people, as illustrated by an amusing incident related by the author in the Acknowledgement. The author sets the scene in the Introduction with a painstaking description of the decline of geometry in the 20<sup>th</sup> century. The battle cry, “Down with Euclid! Death to Triangles”, had been sounded loud and clear by the Bourbakists, a most influential group of French mathematicians. One of them, Jean Dieudonné, is cast in the role of Professor Coxeter’s antagonist—though I must hastily add that he is treated with all due respect, representing a different set of values with its own justifications.

Professor Coxeter’s field of research was definitely unfashionable and set him back in worldly advancements at first. However, he was determined to hold his course (a recurrent theme of the book). In one of the Appendices, the author quotes extensively from a paper by the renowned physicist, Freeman Dyson of Princeton’s Institute of Advanced Studies, on “Unfashionable Pursuits”. Dyson once sent a copy to Professor Coxeter, who most certainly appreciated it very much.

The first chapter deals with the last conference Professor Coxeter attended, in Budapest, Hungary. He was accompanied at the conference by family and colleagues, and by the author, who must have been in the process of getting to know the great man. Many first-hand experiences are recorded, with colourful details. Professor Coxeter must have reflected on his illustrious career and discussed with the author his love of geometry. We learn about the accomplishments of the icons of ancient Greece—Pythagoras, Plato, and Euclid—as well as the lives of Hungarian giants of the more recent past, János Bolyai and Paul Erdős.

The remaining seven chapters of Part I relate events in Professor Coxeter's life in chronological order, starting with his childhood in England. For me, the highlight was his adoption of Canada as his home in 1936 shortly after his marriage. Professor Coxeter lived enough of his long life in this country that Canadians can claim him as a national hero.

The list of people who came into contact with Professor Coxeter and had an influence on him reads like a "Who's Who" in mathematics. At Cambridge, he was rubbing shoulders with J. E. Littlewood, H. F. Baker and G. H. Hardy. In 1932, he went to Princeton as a Rockefeller Fellow. There he studied under Solomon Lefschetz, Oswald Veblen, John von Neumann, Paul Wigner, and George Pólya. The next year, he returned with another fellowship and was in contact with Albert Einstein and Emmy Noether, and worked closely with Herman Weyl.

I mention all this to give the reader an idea of the richness between the covers of this book. There is a lot more in Part I, and Part II is another treasure trove. The last Appendix is a list of the publications of Professor Coxeter. There are also an amazing 74 pages of Endnotes, detailing the meticulous research which went into this book. Although the author must have been in Professor Coxeter's hair for a considerable period, she is conspicuously absent from her own book.

Having said that, let me indulge in a bit of self-reference of my own. My only meeting with Professor Coxeter was at the International Congress of Mathematics Education in Quebec City in August, 1992. During a lunch cruise on the St. Lawrence River, I sat at the same table as Professor Coxeter and his wife. During the meal, a violinist came and played romantic music. It was the Coxeters' fifty-sixth wedding anniversary! I was playing with a geometric puzzle. Professor Coxeter found it intriguing too, and I was pleased to present him with an impromptu anniversary present.

I also met the author, Siobhan Roberts, once, in connection with another of her literary projects. Having had some first-hand knowledge of her work and a little glimpse of how she works, I have awaited the arrival of my review copy with great excitement, and it has exceeded all my expectations. In the Acknowledgement, she lets slip that she is very good in mathematics too, but that alone cannot explain this wonderful piece of work. I will most certainly buy any of her books, on any subject.

The author remarks that the Hungarian mathematician János Bolyai, at the time of his death, in 1860, had received no recognition for his discovery of non-Euclidean geometry. I am happy to say that we have made sufficient progress to have Professor Coxeter take his rightful place in the history of mathematics in his own lifetime.