

BOOK REVIEWS

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The Ellipse : A Historical and Mathematical Journey by Arthur Mazer
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Arthur Mazer started his career at Utah State University as an assistant professor and then transferred to the energy industry. He currently works in industry as a manager of the Quantitative Analytics Department at Southern California Edison. He has written three books : a manuscript on power planning, and two mathematical history books that came out roughly at the same time. The first is the subject of this book review and the second is titled *Quest to understand the motion of the universe*. In the preface, we see Mazer's motivation :

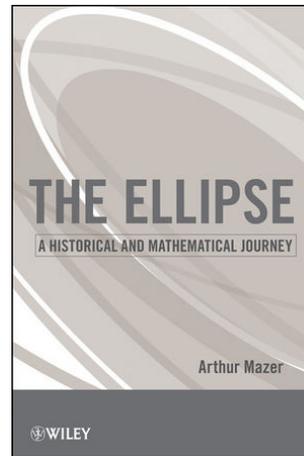
There is of course the opposite argument [...] that is, mathematics and science are the drivers of historical evolution and in Darwinian fashion, philosophies and political entities that promote scientific excellence flourish, while those that do not fade away. This latter argument provides the perspective for this book.

This book seemed to be a bit of a paradox to me. In fact, that is what attracted me to it. The title implies that the book is specialized ; yet, it is published by Wiley as a general interest book. After reading the book, it becomes clear that the book is not about the ellipse. Rather, it uses the ellipse as its main thread to explore the world of mathematics. The chapters are organized roughly in chronological order as the author explores the evolution of thought in society and the interactions between the society and mathematical ideas. Mazer gives witty titles to his chapters, such as “Chapter 6 : The Slayer Calculus” or “Chapter 7 : Eight minutes that changed history”.

The first two chapters focus mainly on history with a bit of a primer on numbers and modular arithmetic that is explored through cycles on graphs. The following five chapters start off with a short introduction, which is then followed by about 50 pages of math. Each of these chapters is an exploration of small math morsels that range in complexity and subject. The link to the ellipse is not always clear at the beginning, but all the threads are neatly tied together into a tapestry about the ellipse by the end of the book.

It may make for some intense reading. I will not go into detail for each chapter, but to give an idea, I will provide a synopsis of “Chapter 4 : The language Algebra”. We start off with Cartesian coordinates, then continue to translations, polynomials, conics and the quadratic formula, the circle and the four dimensional sphere, Cavalieri's theorem, Pyramids, higher dimensions, areas and volumes of spheres, finite series, induction, linear algebra, transformations, determinants, and the ellipse. No spoilers !

The book is well written. It is abundantly illustrated and, to the author's credit, not superfluously. With the hustle and bustle of teaching and the mass of information presented, I am pretty sure I missed a thing or two and a second re-read is a must. A minus for me was that the knowledge about the ellipse exposed in the book ends around the 18th century without any mention of more recent results. It makes it a side project for me to look into in the coming months, unless a *Crua* reader sends me useful references to more recent results and more technical manuscripts about the ellipse. As an avid *Crua* reader, I also hoped the book would make me a better problem solver, but there are no posed problems to be found.



The range of mathematics presented in the book is far-reaching, but at an introductory level. It passes through some number theory, classical geometry, stereometry, calculus, combinatorics, analysis, differential geometry, projective geometry, vector calculus, etc. It could serve as a great run through or “transversal” review of a student’s mathematical studies. If teacher colleges across the country have taken the same path as Quebec’s, this book should be a mandatory read for all new secondary level teachers as it would widen their mathematical horizons greatly, yet at a manageable pace. It could be used in a high school honours math class or for a math camp. If you have read a lot of general interest math books, it depends more on you and what you are looking for in a book. Personally, I am happy to have it on my bookshelf as a reference book and I will definitely try to find the time to re-read it when I am less pressed for time. Happy reading!

