BOOK REVIEWS
John McLoughlin

*Towing Icebergs, Falling Dominoes and Other Adventures in Applied Mathematics*

*Slicing Pizzas, Racing Turtles and Further Adventures in Applied Mathematics*

Both books are by Robert B. Banks, published by Princeton University Press, Princeton, New Jersey.

Reviewed by Ben Newling, Department of Physics, University of New Brunswick, Fredericton, NB.

I very much enjoyed reading Professor Banks’ books, but at the end of the “Adventures” wasn’t exactly certain with whom I should share the enjoyment.

These two titles have been reissued (chronologically backwards and interestingly differently priced) as part of the Princeton Puzzlers series, the strapline of which is “paradoxes, perplexities and mathematical conundrums for the serious head scratcher”. This description is misleading at first blush and I expected some kind of puzzle book with solutions or, at least, maddening hints. What the two volumes represent instead is Professor Banks’ personal collection of interesting worked examples in applied mathematics. Banks was a professor of engineering who had carefully assembled a very individual hoard of interesting problems. For the most part, each chapter or pair of chapters is a self-contained treatment of a single topic, such as the feasibility of towing the titular icebergs to the US from Antarctica as a supply of fresh water. Professor Banks gives plenty of background information about icebergs and carries out calculations on every aspect of the project, including the optimal route, the journey time, the power expended by the imagined fleet of towing vessels and the best ways to melt an iceberg in California.

My personal favourite chapter concerned the propagation of shock waves in traffic jams, but other topics include discussions of meteors, musings on the trajectories of golf balls and models of population dynamics with 23 or so disparate topics in each volume. Each chapter has a very specific title (“Big Things Falling From the Sky”, “Hooks and Slices, Holes in One”, “How Many People Have Ever Lived?”, to name a few), but each manages to touch upon a range of situations in which similar math might apply and to incorporate some fascinating diversions, to boot. I was pleased to learn the population of Pitcairn and to be enthusiastically introduced to
the Scottish mathematician, Peter Tait (1831-1901), for example. Canadian trivia included NRC research into wind turbines, the Petitcodiac river bore and even a Stephen Leacock reference. Throughout, Professor Banks’ understated enthusiasm is evident. He clearly enjoyed collecting the calculations and delighted in sharing them. There is occasional very dry humour and enough breadth that any reader can find some topic that has personal relevance, whether for instance, football, jump ropes, gross domestic product, or staying dry in the rain.

So these are not puzzle books, but neither are they math education books. Professor Banks does not explain any of the mathematics or attempt to teach any mathematical techniques; he expects his readers to be familiar with exponential functions, hyperbolic sines, differential and integral calculus, for example. The mathematics is neither explained nor discussed for its own sake in the first volume, although there is one chapter about irrational numbers and another about number series in Slicing Pizzas. Banks does not show every step in every calculation by any manner of means, but instead highlights the key results in each application. I do not think that the reader will “understand more about mathematics”, as Professor Banks hoped in the preface, at least not solely by reading these books. Active readers, however, will be implicitly challenged to investigate things for themselves and it is entertaining to work through Banks’ calculations, question his assumptions and follow up with the wealth of references to others’ studies of similar situations. The reader will certainly be impressed and entertained by the range of application.

As a teacher, I found the comprehensive bibliography an exciting resource and I was also intrigued to discover whole chapters that might be interesting to use in class or as starting points for further research. Professor Banks also suggests further calculations and projects centred around the theme of each chapter, which I always find a valuable resource when seeking inspiration.

I should mention some niggles. These books are certainly reprints rather than new editions. There are mistakes in the mathematics and in the text, which could easily have been corrected in a new edition. I might even take issue with some of the physics, such as the use of terminology surrounding momentum in the chapter about domino toppling. Some of the examples are naturally dated. Socioeconomic measures are “predicted” for the year 2000, for example and discussion of natural disasters are missing more recent examples. However, updating, comparing or extrapolating suggest natural projects for the interested reader. Most socioeconomic figures are from the US or compared to the US, but that again suggests the possibility of parallel calculations for other nations. The self-contained structure of each chapter leads to some repetition; the drag coefficient is introduced three
times in almost identical fashion in the first volume. All these are minor annoy-
ances, however. I did find myself swept along by the enthusiasm of the writing
style and the eclecticism of the collection and I think, in the end, the two volumes
might be enjoyably dipped into by any math, science or engineering educator and
might be recommended in turn to interested students. The books could be read
for pleasure or used as a teaching resource. Despite the title of the series, these are
not books for someone seeking mathematical puzzles, but they are worth picking
up, nevertheless, for someone interested in the application of mathematics.

Notice to Crux Readers

On behalf of CMS, I would like to take this opportunity to thank our Crux
subscribers for your ongoing patience, understanding and loyalty to Crux as we
continue to address the production delays. The new Editor-in-Chief, Kseniya
Garaschuk and the Crux Editorial Board are currently working on the remaining
2013 issues (September to December 2013), assembling 2014 volume materials,
and developing new content. If you have not yet renewed your subscription for
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The CMS apologizes for the ongoing production delays and can assure subscribers
that everyone is working as best they can to resolve this challenging situation.

Johan Rudnick, Managing Editor

Avis aux lecteurs Crux

Au nom de la SMC, j’aimerais remercier nos abonnés du Crux de leur grande
patience, de leur compréhension et de leur fidélité à la revue suite au retard
de production que nous connaissons. La nouvelle rédactrice en chef, Kseniya
Garaschuk, et le conseil de rédaction de la revue s’affairent en ce moment aux
derniers numéros de 2013 (de septembre à décembre), à rassembler le matériel
pour le volume 2014 et à créer du nouveau contenu. Si vous n’avez pas encore
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La SMC s’excuse de ce retard et assure ses abonnés que chacun fait de son mieux
pour résoudre cette situation difficile.

Johan Rudnick, Réacteur-gérant