

# Book Review

## Oxford Figures: 800 Years of the Mathematical Sciences

Edited by John Fauvel, Raymond Flood,  
and Robin Wilson

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When mathematicians think about English universities, the first name that usually comes to mind is Cambridge. *Oxford Figures* strives to change that.

While fanciful legends connect Oxford University with Brute the Trojan, reputed to be the grandson of Aeneas, it seems safer to say that the famous institution was founded later in the 12<sup>th</sup> century. When historian, Gerald of Wales, reported on scholarship at that soggy point of the English Midlands in 1188, he had no idea that, 800 years later, Oxford's executives would mark the event with a major fund-raising appeal. *Oxford Figures* is an attempt to map Oxford's mathematical landscape during the eight intervening centuries.

The first chapter shows the reader what a complicated landscape it is. Chapter One, "800 Years of Mathematical Traditions," provides us with a panoramic view. Medieval Oxford pursued mathematics, believing it to be a peek at God's master plan.. Franciscan friar Roger Bacon expressed the belief in this way:

*He who knows not mathematics cannot know the  
other sciences nor the things of this world. And,*

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*what is worse, those who have no knowledge of mathematics do not perceive their own ignorance and so do not look for a cure.*

Unfortunately, the friars had no cure for bubonic plague. More than one third of England's population succumbed to the dreadful disease in the mid 14th century. A variety of social and political ills compounded the misery. It would take more than 300 years for Oxford to recover.

Wide enthusiasm for mathematics would require a longer convalescence. Nobles and gentlemen of the Renaissance saw little reason to have their sons study theoretical arithmetic and geometry. These would not supply them with the sophistication and grace that they valued. Moreover, the newer focus of mathematics seemed intended for tradesmen. Oxford humanist, Juan Luis Vives, a fellow of Corpus Christi College, offered discouraging advice:

*The mathematical sciences are particularly disciplinary to flighty and restless intellects which are inclined to slackness...Often those students who have no bent for the more agreeable branches of knowledge are most apt in these severe and crabbed mathematical studies...anxious inquiry into such mathematical problems leads away from the things of life, and estranges men from a perception of what conduces to the common weal.*

Ironically, it was during these bleak years that Oxford produced its greatest mathematician, Thomas Harriot. Shortly after receiving his Bachelor of Arts degree in 1580, Harriot was employed by Walter Raleigh to help prepare for the colonization of what would later be called Virginia. During his long life (he lived until the age of 101), Harriot made discoveries in navigation, optics, mechanics and astronomy.

At roughly this time, Sir Henry Savile endowed two chairs, one in geometry and the other in astronomy. These chairs profoundly encouraged mathematics research and teaching at Oxford. Savile was both well-read and well-traveled. His lecture notes on Ptolemy's *Almagest* are preserved in Oxford's Bodleian Library. Savile was often critical – some would have said arrogant – reserving special disdain for superficially clever students. “If I would look for witts, I would go to Newgate [prison],” Savile once declared. “There be the witts..”

It was also at this time that Oxford's tutorial system began. Endowed colleges formed, and within them influential tutors advised students on matters both academic and personal. Such a

system could be injurious to the health of mathematics, as J.J. Sylvester would discover 300 years later.

By now the reader might wonder aloud if the celebration of mathematics that *Oxford Figures* promised is mostly stale peanuts and flat Coke. While illustrious guests such as Christopher Wren, Robert Boyle and Edmund Halley are yet to arrive, we read that they often sought their mathematical company beyond the gates of Oxford's colleges. As late as 1885, when Sylvester was lured from Johns Hopkins University by the offer of the Savilian Chair of Geometry, Oxford's mathematical ambitions were centered primarily on getting students to pass their examinations, not on research. Sylvester wrote:

*Here in Oxford I am fortunate if I get an auditory of 6 persons. The Tutors Combination (carried to a great extent and now including all the principal colleges) practically reducing the Professors lectures to a Nullity ... I begin to feel therefore very like a stalled Ox.*

The future of mathematics at Oxford seemed dim to Sylvester, who predicted that "...Mathematical science here is doomed and must eventually fall off like a withered branch from a tree which derives no nutriment from its roots." Fortunately, fertilizer would arrive.

G.H. Hardy came to Oxford in 1920, lured from Cambridge by the promise of the Savilian Chair of Geometry. Enthusiastic and energetic, Hardy became the sun of a mathematical solar system that included E.C. Titchmarsh, Mary Cartwright, L.S. Bosanquet and others. "Mathematicians are reasonably cheap, but they cannot be had for nothing," Hardy proclaimed as he lobbied for new appointments and, above all, a mathematics institute.

Hardy's campaign was not very successful. Between the years of 1930 and 1939 the number of college Fellows rose from eight to a mere ten. A mathematics institute was established, but it occupied only part of a wing in Radcliffe Science Library. In the meantime, Hardy had left Oxford for Cambridge, where he assumed the Sadleirian Chair of Pure Mathematics. Despite the disappointments, Hardy had given Oxford's mathematical community a peek at the Promised Land. Thirty-six years later, the personable Charles Coulson, Rouse Ball Professor of Mathematics, would lead Oxford mathematicians from their cramped and dingy building at Parks Road to the more spacious institute at St. Giles which it occupies today.

*Oxford Figures* is similar in form to two previous Oxford University Press books also edited by Fauvel, Flood and Wilson: *Let Newton Be!* (with fourth editor Michael Shortland) as well as *Möbius and his Band*. It is not a book to be read from cover to cover. As its fifteen chapters are the collective efforts of ten contributors, occasional redundancies appear, and complex themes have no time to develop. However, *Oxford Figures* is filled with history, anecdotes and fascinating illustrations that reward even the casual reader.

**In Brief:** *The Annotated Flatland* Introduction and notes by Ian Stewart. Perseus Publishing, 2002, 239 pp., \ \$30.00.

Many have heard about Edwin Abbott's *Flatland*, but far fewer have read it. Abbott wrote his fantasy in 1884, hoping to popularize the new idea of four spatial dimensions. However, for modern readers *Flatland* is a minefield of subtle Victorian references and satire. We can all step more safely thanks to Ian Stewart.

Ian Stewart, Professor of Mathematics at University of Warwick and author of more than 60 books such as *Nature's Numbers*, has done for *Flatland* what Martin Gardner did for Lewis Carroll's *Alice in Wonderland* more than forty years ago. The margin notes contain concise lessons in physics and mathematics as well as history. (The introduction even provides maps and photographs that enable you to visit Abbott's grave in Hampstead Cemetery during your next holiday abroad.) If you have already read *Flatland*, then this annotated edition will answer the questions that you have undoubtedly had. If you have never read *Flatland*, then Ian Stewart's book will help you acquire a new dimension.

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