

to give a seminar there. Pauling brilliantly assimilated the pattern of results acquired by WL and his acolytes, and realized, before WL did, that  $\text{Si}^{4+}$  ions were almost invariably surrounded by four  $\text{O}^{2-}$  ions at the vertices of a tetrahedron.

This led Pauling, after his return to the California Institute of Technology, to enunciate the famous “Pauling Rules” concerning bonding in complex oxide structures. Although WL later applauded these rules, he never forgot the disappointment that befell him when he realized that Pauling’s insight had occurred in his laboratory. This was a source of rivalry between these two great giants, and it accounts, in part, for the inexpressible glee that overtook WL when his colleagues at Cambridge (James Watson and Francis Crick) solved the structure of DNA in a race that involved Pauling.

Both Braggs greatly respected, and

did everything within their power to preserve and consolidate, the traditions of the Royal Institution and the DFRL, and the exciting aura that pervaded the two. Their exceptional gifts for popular exposition, their strong feelings for the technician in the workshop, their reverence for Faraday and the unique qualities of the Royal Institution were exuded in their every action. This emerges strongly from this fine book and is corroborated by the people I knew who worked with them: Cox and Lonsdale in the case of WH; and Max Perutz, John Kendrew and David Phillips, as well as Louise Johnson, Uli Arndt, Jack Dunitz, Michael Rossman, Bill Coates and George Porter in the case of WL.

All these individuals, as well as many others (including the occasionally hypercritical Crick), have expressed admiration for the two Braggs. It

was WL’s perspective and vision as Cavendish Professor that encouraged Martin Ryle and Tony Hewish to pursue their Nobel-prize-winning work in radio astronomy, and Perutz and Kendrew to set up the Medical Research Council Laboratory of Molecular Biology in Cambridge. They were also, in the old-fashioned sense of the word, “gentlemen”: not without fault and even, very occasionally, guilty of some forgivable vanity. After I completed reading Jenkin’s masterly exposition, I was overtaken by the same sentiment that Perutz expressed when he reviewed Gwendoline Caroe’s biography of her father WH Bragg: “the great can also be good”.

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## Between the lines



**Not just cricket**  
Puzzling statistical conundrums abound in Julian Havil’s new book *Impossible?*.

### Confound your intuition

“Statistics are like bikinis. What they reveal is suggestive, but what they conceal is vital.” Julian Havil uses this quote from Aaron Levenstein to open the second chapter of his new book *Impossible?* and it neatly sums up the baffling statistical conundrums that follow. Readers are invited to consider, for example, two cricketers Steve and Mark who play in two consecutive series. Steve has the better batting average in each series, but Mark has the better average overall. Impossible? Not so, as Havil goes on to demonstrate. This book is filled with similar problems that sound simple but that have surprising counterintuitive solutions. In many cases Havil, as well as providing detailed proofs, also describes the history and personalities associated with each problem. *Impossible?* will test the mind of even the most astute logician and requires a basic knowledge of calculus, but the rewards of figuring out these baffling conundrums are well worth the effort.

● 2008 Princeton University Press  
£16.95/\$27.95hb 264pp

### Guessing games

Have you ever tried to calculate the surface area of a typical bath towel taking into account each individual

fibre? Or perhaps puzzled over the length of all the DNA in your body?

*Guesstimation*, by physicist Lawrence Weinstein and mathematician John Adam, can help you work out the answers, as this book aims to teach readers to quickly estimate virtually anything by taking them through a diverse set of approximation problems. Along the way the authors also include plenty of interesting physics, chemistry and biology, not to mention the odd anecdote.

Enrico Fermi, for example, is said to have dropped a few scraps of paper during one of the first atomic bomb tests and was then able to estimate the strength of the blast from the way that they fell. The authors claim that such estimation skills are invaluable, as they enable people to better understand the world around them as well as to recognize scientific and political nonsense. Indeed, estimation questions are increasingly being used in job interviews. But whether it is read for business or pleasure, this book should prove both invaluable and highly entertaining. As for the two questions posed earlier, the answers are approximately  $80 \text{ m}^2$  and  $10^{14} \text{ m}$ , respectively.

● 2008 Princeton University Press  
£11.95/\$19.95pb 320pp

### The cost of going nuclear

The nuclear industry is currently going through a turbulent period. Just when nuclear power looked to be in terminal decline, climate change became a huge political issue and going nuclear became a serious option again. Indeed, in January the UK government published a White Paper in which it opened the door to a new generation of privately funded nuclear power stations. The timing for a new book examining the economics of the UK’s nuclear industry could not, therefore, be better. *Nukenomics*, by nuclear consultant Ian Jackson, analyses the major trends and market forces that are shaping the industry today. It also provides an insight into the nuclear industry’s past and predicts how it is likely to develop in the future. Jackson does this by focusing on five major themes: the decommissioning market; selling nuclear real estate; nuclear-waste repositories; reprocessing and the market for MOX; and reactor economics in the context of climate change. The result is a clear and thoughtful book that will be of use to both the layperson and the nuclear professional alike.

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