though it is, throws up a few of these not quite mathematical properties. In other places, I would have liked to see connections more thoroughly explored. Tolstoy was famous for rejecting the 'great man' theory of history. In an overtly mathematical analogy, he saw history as governed by 'integrating' over all the small individual tendencies—differentials, as it were—rather than the actions of one or two people taken in isolation. Likening historical forces to the calculus is an interesting idea. But does it hold water? Well, sorry to nitpick, but the calculus as Tolstoy would have known it deployed infinitesimals, and only finitely many humans contribute to a historical event. Moreover, it's unclear whether there are any laws of history, and it's even less clear that history is a closed system, determined by humans, somehow splendidly isolated from other natural phenomena. If Tolstoy had lived on another few decades, he might have learned, through chaos theory, that a small disturbance by even a single individual can have an immense impact. History as calculus, then, is an intriguing thought, but if it genuinely forms the intellectual backbone to *War and Peace's* 100+-page Epilogue, a gentle challenge to the idea would not have been amiss.

However, to elaborate on these sorts of concerns would have changed the character of the book, probably for the worse. The book's main aim is to enhance our appreciation of mathematics and literature by exploring their connections and, as far as that goes, we can safely say that it has done its job.

And so to the final little mathematical twist. Throughout the book, especially in Part I, we are told about the various mathematical games literary authors play. They might be hidden occurrences of the number 42 in *Alice Through the Looking-Glass*; or the book might be structured in a mathematically interesting way, a prime example being Eleanor Catton's *The Luminaries*, in which each chapter is half the length of the previous one. That the number of *Once Upon A Prime's* pages is mathematically interesting should come as no surprise, then. It is 256 or 2^8.

10.1017/mag.2024.151 © The Authors, 2024
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on behalf of The Mathematical Association

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The spirit of mathematics by David Acheson, pp 186, £15.99, ISBN 978-0-19-284508-5, Oxford University Press (2023)

The author's previous books, published by OUP and with a similar format, have all been reviewed in this journal [1, 2, 3]. They share a consistency in approach, in that they all aim to display the joys of the subject in a way which neither baffles nor condescends to the likely readership. The first book covered a wide range of topics from Pythagoras' to number theory, whilst the second and third had, as befits their titles, a more limited focus. There is no doubt that David Acheson is a first-rate communicator and an ambassador for the subject which is dear to *Gazette* readers. However, the obvious question remains: why a fourth book of a similar nature to the first three?

Actually there is not a great deal of overlap. If there is a unifying theme to the narrative, it is algebra, and the author is at pains to show why this area of mathematics, which is clearly unfamiliar to most politicians who are offering 'advice' on how to teach the subject, is important and intriguing. However, I am not sure that the best way to explain to a sceptic why $- \times - = +$ is to derive it formally from the rules of algebra. My own approach would be purely arithmetical and might involve a scenario where students in a communal house are both raiding the fridge for alcoholic refreshment and occasionally topping up the supply. Here 'plus' and

'minus' can be interpreted both spatially (how much beer is available?) and also temporally (going forwards and back in time). Perhaps this is too near the knuckle to wheel out in school, but I think it is a nice analogy and you don't need to write anything down.

The familiar 'word-less' proof of Pythagoras' (which appears in a short story by Aldous Huxley) reappears, and also the 1089 trick, but on the whole the material covered is new (even if some of it will be very familiar to the readership). I also enjoyed the puzzles in Chapter 8, two of which were new to me, and they are all worth using in the classroom.

Given the author's own specialisms (mainly fluid dynamics and astrophysics), it is good to see a substantial emphasis on the use of algebra in applied mathematics. There are stimulating chapters on passing trains, crossed ladders, rollercoaster dynamics and tuning a guitar. The book ends with some paradoxes involving infinite series and the AM-GM inequality. I can recommend it thoroughly.

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10.1017/mag.2024.152
Published by Cambridge University Press
on behalf of The Mathematical Association

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Acknowledgements

The Editor wishes to thank the following for refereeing items for the *Gazette* in the last year.

Referee (Affiliation)

Stephen Abbott (Felixstowe); Ian Anderson (University of Glasgow); John Appleby (University of Newcastle); Jessica Banks (University of Liverpool); Alan Beardon (University of Cambridge); David Brannan (Bedford); Mark Cooker (University of East Anglia); David Crawford (RGS Leicester);Tony Crilly (St Albans); Stan Dolan (Charmouth); Vince Ferlini (Keene State College, USA), Michael Fox (Leamington Spa); Peter Giblin (University of Liverpool); Roger Heath-Brown (University of Oxford); Sam Hewitt (St Paul's School); David Hopkins (London); Graham Jameson (Lancaster University); Paul Levrie (Turnhout, Belgium); Barry Lewis (London); Martin Lukarevski (Skopje, North Macedonia); Des MacHale (University of Cork); John Mahony (Christchurch, NZ); Adam McBride (Edinburgh); Robin McLean (University of Liverpool); Tomas Persson (Centre for Mathematical Sciences, Lund, Sweden); Chris Pritchard (Callendar); Anthony Robin (Colchester); Chris Robson (Earswick); Tom Roper (Hipperholme); Chris Sangwin (University of Edinburgh); Peter Shiu (Sheffield); John Silvester (King's College, London); Jim Simons (Cheltenham); Alan Slomson (Leeds); David Stirzaker (St John's College, Oxford); George Stoica (New Brunswick, Canada); Zhivko Stoyanov (St Paul's School); Owen Toller (London).

10.1017/mag.2024.153

Published by Cambridge University Presson behalf of The Mathematical Association