(pp. 178–179). The four-dimensional analogue of the cube is the hypercube, its net was used in the art of Salvador Dali to portray the crucifixion.

The strength of the book is particularly shown where connections are built over a number of areas. The introduction is preceded by a single quote from the physicist Richard Feynman on discovery in nature where, 'each small piece of her fabric reveals the organisation of the entire tapestry' (p. vii). An example is given in the discussion of how, 'Astronomers and geographers sought ways to represent the features of a spherical globe on a flat surface' (p. 276). It was eventually found that 'a hemisphere of the globe can be projected onto a disc by using a technique known as stereographic projection' (p. 287), which also allows for the celestial sphere to be represented on an astrolabe.

Mee has created many of the diagrams shown and includes a number of his own impressive mathematical digital artworks, which brings the book up to modern times. An enjoyable, thought provoking read.

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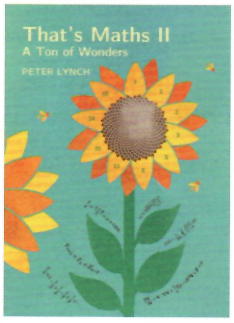
## That's Maths II: A Ton of Wonders

### Peter Lynch

LOGIC PRESS 2020, 239 PAGES
PRICE (PAPERBACK) £16.89, ISBN 978-1-71650-799-1

**This book is the second collection** of brief articles by the author on a wide range of both pure and applied mathematics, parts of which have been previously published in a column in *The Irish Times*, some taken from his blog and with a generous use of Wikipedia articles. Some 64 such chapters cover topics ranging from number theory, geometry and series; to applications in engineering, technology and astronomy and, as might be expected, we are introduced to a number of Irish mathematicians of note. It is claimed to be suitable for anyone with an interest in mathematics and science and that if a particular article is too difficult then it is suggested that this should just be skipped over as the topics are said to be in random order.




Peter Lynch was Professor of Meteorology in the School of Mathematical Sciences at University College Dublin from 2004 to 2013 and this publication is witness to his continued passion for all things mathematical. He starts by urging his readers to follow George Pólya's advice to think laterally when confronted by a mathematical problem although most of the problems considered here have corresponding solutions which we are to admire not determine. Where the author deems it appropriate the sources of the problem and its solution are listed at the end of each little chapter and this should appeal to those who wish to pursue a topic further.

As might be expected some of the 'usual suspects' of a popularising book make their appearance here such as RSA encryption and Kurt Gödel's incompleteness theorem. In addition, some of the chapters have catchy titles, perhaps to encourage the learner to keep going, so we have Squircles, Slicing Doughnuts and the Flight of the Bumblebee as examples of such, although for the most part the headings describe what follows in an accurate manner. There are also many helpful diagrams that illustrate the text.

Numbers and their connections take up a generous number of articles starting from the number zero; through the elegant surreals of John Horton Conway; the Mersenne primes; the RSA encryption system; the Riemann hypothesis and prime pairs with the Intel Pentium chip. The rationals are put in an appropriate sequence, placed on a suitable tree and then re-counted again and nicely illustrated.

Geometry also lends itself to illustrations and so we have Bertrand's paradox discussed and illustrated; Squircles and superellipses; Cassinian ovals; Leonardo's illustrations; Venn diagrams and graphs; Voronoi diagrams; knot links and logos and some remarkable spirals. Series too can be illustrated and we have random harmonic series; Taylor series and precursors so treated and he gives divergences special attention.

In terms of applications we have the search for planet nine and Johannes Kepler's attempt to model the known solar system using the five platonic solids and the music of the spheres. More down to earth is Kelvin's analogue computer used to predict tides.

Weather fronts are described and modelled simply and pictorially. Turbulence is defined and appreciated and the Navier–Stokes equation is stated as a successful descriptor of fluid behaviour.

Mention of the Irishman George Gabriel Stokes leads us to note that a number of eminent Irishmen and their achievements are encountered. Thus, we have James Joyce as the author of *Ulysses*; Ernest Shackleton as a great navigator; William Rowan Hamilton and his quaternions; Henry John Stephen Smith and the ternary set to name a few. Lastly, we learn of Robert Murphy from County Cork who although a true genius is a warning of what happens if we have a chaotic lifestyle!

Members who have enjoyed the IMA's very own cornucopia of mathematical wonders in its *50 Visions of Mathematics* [1] in which our author contributed in Chapter 31, would also enjoy the collection presented here and could go on to investigate his first volume [2].

Should one give or loan this to friends and family then, although those with only school mathematics would manage most of the articles, one would need to be on hand to explain what del and del squared, partial derivatives and PDEs and other post school concepts mean that are dropped in to the text unheralded but necessarily! But, after all, that is part of our educational task.

**Laurence E. Nicholas CMath FIMA**

REFERENCES

1 Parc, S. (ed.) (2014) *50 Visions of Mathematics*, Oxford University Press.

2 Lynch, P. (2016) *That's Maths: The Mathematical Magic of Everyday Life*, Gill.

# IMA members

The Institute records with regret the death of the following members:

**Graham Fielder** **Ruth M. Rees**