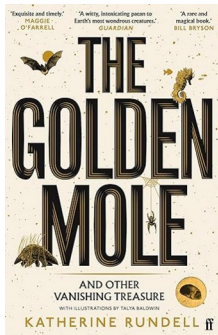


## The Golden Mole and Other Vanishing Treasure

Katherine Rundell  
London: Faber and Faber, 2023  
197 pp. £10.99  
ISBN 978 0 571 36250 9



This is a book about the wonders of the natural world. Beautifully written, it aims to expose the reader to awe-inspiring

animals and their amazing feats, while also questioning what else might be out there to be discovered in a world where the variety of species is diminishing because of often-irresponsible human actions.

Each of the carefully chosen selection of 21 animals (22 if you include the final section about humans) gets its own short 'essay'. These tell the story of each endangered species as a series of anecdotes, ranging from weird and wonderful facts to how they have been viewed, used and treated in history, right through to examples of their appearance in classical myths and folklore. Quotes from literature, lines of poetry and many stories (whether fiction or reality) are woven around the underlying impassioned plea for us to protect our natural world before it is too late. Choosing just 21 animals was no mean feat: as the author points out, using the criteria of choosing endangered species or those with an endangered subspecies, there are relatively few that don't make the list!

Initially, the book felt rather disjointed but very rapidly the common themes of longevity,

of uniqueness and of man's changing relationship with these species were carefully set against the backdrop of the threats of extinction if nothing changes. The reader learns about trafficking of pangolins, 'extinction speculation' of tuna, 'over-exploitative, non-selective' fishing endangering seahorses, and how mining is causing the loss of habitat for the rare golden mole.

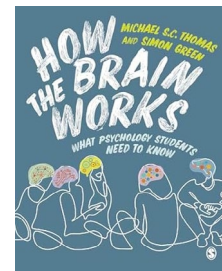
Interestingly, having wrestled with whether this book was classified as science or natural history, I discovered that its Dewey Decimal Classification places it under social sciences (biosphere and biospheric resources). While it is clearly much more than the classification would suggest, it is quirky and would not appeal to everyone. Some will find the lack of continuity a barrier, while others will almost certainly want more scientific facts. This wide-ranging approach also makes it difficult to know where to suggest that it sits in a school science department and who might read it. There are undoubtedly some fascinating facts and anecdotes that can be used in teaching; the endangered species angle will potentially be of interest to pupils of all ages and the crossover between the arts, humanities and science could be harnessed to inform an exciting cross-curricula project. What this book is not, is a core science book for a gifted science student to get their teeth into, but it would be a worthy addition to a school library collection.

**Janet Mitchell**

*Recently retired chemistry teacher  
from Surrey*

## How the Brain Works: What Psychology Students Need to Know

Michael S.C. Thomas and  
Simon Green  
London: Sage, 2023  
281 pp. £18.99  
ISBN 978 1 5297 4194 0



As teachers we are in the business of literally changing the connections in the brains of our students.

However, many of us only have a rudimentary knowledge of how the brain actually works. This book provides a comprehensive and authoritative guide to the most complex of organs and I would strongly recommend that those involved in education, not just psychology students, read it.

The chapter sequence creates a coherent narrative, starting with the evolutionary perspective about why the brain is like it is and how it functions, and moving to why it can be considered to be like a computer, but is in fact not at all like one. The second half focuses on specific topics including learning and development, sleep, language, consciousness and decision-making. Alongside the detailed descriptions of the structure and function of the brain, there is honesty and humility when laying out what neuroscientists know about the brain and what puzzles they are yet to solve. For example, where is the information stored when it passes through the hippocampus?

The most pertinent chapter for teachers is Chapter 7 on development and learning. It provides further context for

the complexity of the brain – ‘neurons are generated at a rate of 250 000 per minute during prenatal development’ (p. 114) – and developmental behaviour – ‘children are active explorers, they probe and query the world’ (p. 118). In addition, some key myths around learning, development and the brain are carefully unpicked and clear explanations are given for these misconceptions.

By necessity, some sections of the book are a challenging read, but the authors use several strategies to help ease the reader into the recently explored depths of neuroscience. The chapter titles and subheadings are concise and to the point and, where they take the form of questions, they are particularly effective at stimulating thinking. I enjoyed the etymology of terms that allowed me to visualise the structures and their positions in the brain, such as the almond-shaped amygdala. The gentle humour adds lightness to what could easily be a heavy-going topic, full of dense biological terms and complex concepts. There is a good range of diagrams, most of which are excellent and informative. However, I found a few to be superfluous, adding little apart from breaking up the text.

It can be argued that teachers only need to know the impact of different pedagogical strategies on student attainment, for example if I do x, it will increase their knowledge of y. This book gives some insight into the reasons behind x leading to y, and provides the knowledge underpinning the particular strategy, thus allowing us, as teachers, to be able to transfer and adapt these ideas to further the impact of our pedagogy.

**Helen Darlington**

Faculty Progress Leader for Science,  
South Wirral High School

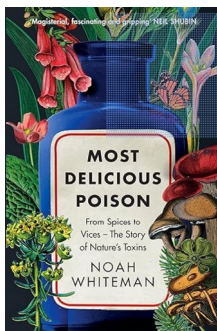
## Most Delicious Poison: From Spices to Vices – The Story of Nature’s Toxins

Noah Whiteman

London: Oneworld Publications, 2023

304 pp. £17.59

ISBN 978 0 86154451 6



*Most Delicious Poison: From Spices to Vices* is a journey through the dangers of everyday substances

as well as a story of addiction to some of these substances. Noah Whiteman, as a Professor at the University of California and a world-leading evolutionary biologist, knows what he is talking about. He has appeared alongside Stephen Hawking and featured in some of the biggest scientific publications, including *Nature* and *Science*.

The chapters each discuss a category of toxins, such as opioids in ‘Opioid overlords’ and those that affect hormones in ‘Hijacked hormones’, meaning you can read the book page by page or focus on a particular interest. Each chapter takes you on a journey of stories, anecdotes and life events that all act to inform you about the dangers of various natural toxins. Intertwined through the book is the story of addiction and its impact. So, although the book is very much an informative guide jam-packed with nuggets of information in biology and chemistry, it is also a personal story.

I found this book very interesting, enjoying the new and more obscure knowledge that it provides abundantly. In the classroom it could be used to really engage students on topics such as plants, disease

and natural selection. There is a lot of scientific terminology in the book that a layperson may struggle with, but anyone with an interest or background in science would be comfortable with it. The book also contains some very beautiful illustrations, which are a lovely added touch. Overall, this is a very enjoyable read and I will certainly be using some of the stories in my classroom!

**Colette Christian**

Science teacher, Parrenthorn High School, Manchester

## What’s Hidden Inside Planets?

Sabine Stanley with John Wenz

Baltimore: Johns Hopkins University Press, 2024. 246 pp. £13.34

ISBN 978 1 4214 4816 9



This excellent and very readable book is part of the Johns Hopkins ‘Wavelengths’ series that brings readers the

inside stories and research of the Bloomberg Distinguished Professors of Johns Hopkins University, USA. Sabine Stanley, leader of the Magnetism and Planetary Interiors (MagPi) research group in the Department of Earth and Planetary Sciences at the university, and her team, employ a combination of spacecraft data and computer simulations to gain insights into the interiors of planets, moons, asteroids and exoplanets.

The first five chapters cover topics such as what causes the Earth’s magnetic field, the limited success of projects drilling into the Earth’s crust, exoplanets, the role of meteorites in telling us about the solar system and its origins, what can be learned from gravitational

and electromagnetic fields, and the associated challenges of using magnetometers and seismometers.

My favourite sections are the final two chapters, when we are told about curious elements such as helium-3, and about the development of telescopes and imminent space missions. The potential information from the much higher resolution of the James Webb infrared telescope (launched in 2021) and the Extremely Large Telescope (currently under construction on top of a Chilean mountain) should be considerable. NASA and ESA are currently working on missions to the asteroid belt, Venus, Mars and Jupiter. No mention is given to any other space agencies.

There are very detailed further reading sections in each chapter, as well as helpful notes contained in the body of the text. I would have found these sections easier to follow had they been contained in text boxes. The whole book makes very interesting and enjoyable reading and, while probably of more interest to A-level students to see how their physical sciences knowledge is applied, it would be perfectly accessible to an interested GCSE student or amateur enthusiast. Mathematics is kept to a minimum: the author uses far more cooking analogies than she does mathematics equations. Her interesting personal story might inspire female physical science students in particular to follow her career path. Given the extremely long time schedules from concept to realisation for the planned space missions and projects, there will be enough data to keep current and future planetary researchers in business for the whole of their working lives.

**Gordon Miller**

Retired physics schoolmaster and university adviser

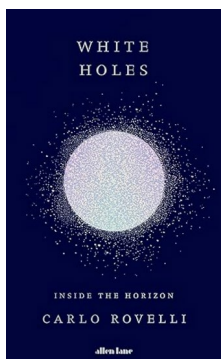
## White Holes: Inside the Horizon

Carlo Rovelli

London: Allen Lane, 2023

147 pp. £14.99

ISBN 978 0 241 62897 3



*White Holes* is the latest and shortest of Carlo Rovelli's books. Originally written in Italian, it has been translated into English

by Simon Carnell, who has done well to convey the narrative in an engagingly conversational style.

Rovelli's central idea is that black holes can 'rebound' to become white holes because the appropriate equations do not change when time is reversed. 'I have two readers in mind when I write', the author reveals, 'One knows nothing about physics ... the other knows everything. I imagine that those who know nothing ... would find details useless and burdensome. The experts, on the other hand, know the details already ... they want a novel perspective.' This is an astute observation that serves the book well.

That said, it is regrettable that the text's diversionary reflections are marked by a total lack of capitalisation as this significantly hinders readability. I also dislike the frequent references to classical literature (specifically, Dante) that smacks slightly of self-indulgence. But if these things are put to one side, *White Holes* is an excellent read.

Rovelli nicely explains the issue of viewpoint when a spacecraft approaches a black hole's event horizon: distant observers think the spacecraft's clock runs slow but to those inside, the clocks are all performing normally.

There is a great analogy about postal services that become increasingly sluggish despite daily deposits into the collection boxes. Another useful model compares small marbles and large balls when considering the difference between energy and information.

Although the book has only a few diagrams, those that appear are very helpful, especially when explaining the geometry of black holes. Rovelli describes the interior as being 'a very long funnel ... [that] lengthens and narrows with the passage of time'. Eventually the funnel will be infinitely long, but at a finite time the matter will be compressed to a Planck star and quantum effects will allow matter to tunnel into the immediate future, thus avoiding the singularity itself. 'The leap of spacetime is not a phenomenon that takes place in space and time ... It is an instantaneous quantum transition from one configuration of space to another.'

This is loop quantum gravity, and once the change has occurred the usual equations come back into play, except that the deepening black hole is now a white hole that is becoming shallower and wider within its event horizon. If that sounds vaguely familiar, Rovelli throws an acknowledgement in the direction of a rebounding universe in which the Big Bang is preceded by a Big Crunch.

To an external observer, a white hole is no different from a black hole. This is surprising but can be justified, not least because reversing time means opposite velocities but the same attractive force (think of reversing the film of a tossed ball rising and falling). The conclusion is certainly convenient since there is observational evidence only



for black holes – which may, therefore, actually be white. This is a gem of a book that should be accessible to students aged from 16 years upwards and is brief enough to appeal to the keenest readers who are a little younger.

**Jon Tarrant**

*Semi-retired A-level physics teacher and author/photographer based in Jersey, who blogs at [physbang.com](http://physbang.com)*

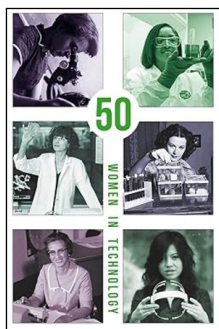
## 50 Women in Technology

Cheryl Robson

Supernova Books, 2023

253 pp. £19.99

ISBN 978 1 913641 32 0



Every school, library and educational institution globally should own this book. There is a pressing need for more

young people to enter STEM careers to solve our 21st century problems but, despite numerous programmes to even out the gender divide in STEM, there are still proportionally more males in STEM careers than females. Numerous pieces of research have indicated that this is partly because many young girls feel that they don't belong in STEM; this book helps them understand that they do belong, with both older and more contemporary examples of women who have made a name for themselves with their STEM careers.

*50 Women in Technology* consists of two distinct halves. The first half details the notable contributions women in the past two centuries have made to the advancement of the human race through their STEM careers, while the second half consists of interviews with women who have achieved notable success with their STEM careers in the last decade. These two halves complement each other well. The first half, detailing women pioneers in STEM, paints a bleak picture: these women in STEM were rarely taken seriously during their prime and only received accolades and recognition either decades later or posthumously. The unfortunate reality of these women pioneers could send a bleak message to the many young girls who want to engage with STEM education, but the latter half of the book is its true strength.

The second half of the book consists of interviews with women who have made a name for themselves in their STEM careers over the last decade, and makes sure that every girl can see themselves in these interviews. The STEM fields of these successful women range from medicine to game design, entrepreneurship to robotics, with women of all ages and ethnicities being featured. These sections initially focus more on successful women from English-speaking countries (notably England and America) but they then showcase the lived experiences of women across

Africa, Asia, Latin America and Oceania. Interviews with these modern women in STEM not only detail how they got into STEM and the issues they faced entering a male-dominated industry, but provide interesting stories on the technical level of their work and career paths.

It is this latter half that separates *50 Women in Technology* from other similar books. It does not exclusively present the standard, now-famous women in technology from the past, but the modern, contemporary women with whom young girls of today can engage and interact, whether it is at events or virtually. This tangibility to modern-day women in technology shows young girls that this is what they can be today. This book is a good read not just for young girls who want to get into a STEM career but for anyone who ever wanted to get into a STEM career but felt they didn't belong. It should be immediately available anywhere where people, young or old, rich or poor, male or female, want to enrich their lives and fulfil their dreams.

**Francis Jones**

*Experienced chemistry teacher and founder of STEM@Home Ltd*

**Maria Kettle**, Book Reviews Editor, worked as a physics teacher in sixth-form settings for 18 years, then 11½ years as Outreach Officer, Department of Engineering, University of Cambridge.

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