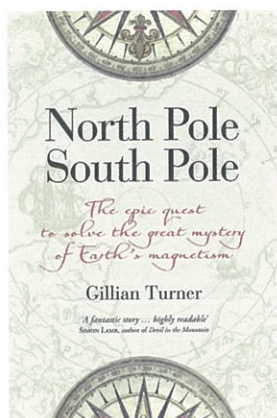


North Pole, South Pole: The epic quest to solve the great mystery of earth's magnetism

by Gillian Turner
Publisher: AWA Press, Wellington,
New Zealand, 2010, 274 pp.
RRP: \$35.00 (paperback),
ISBN: 9780958275002



Gillian Turner, the author of this book, has made a career in geophysics at the Victoria University of Wellington, New Zealand, initially upon the basis of research in paleomagnetism. Over the years she has been a frequent visitor to the paleomagnetic laboratory at Black Mountain developed in Canberra by the Australian National University, and also used extensively by Geoscience Australia and others. In terms of academic influence (very much one of the threads of the book) Turner was a research student of Roy Thompson and Ken Creer at the University of Edinburgh, Scotland. Creer in turn, earlier in the 1950s, was a student of Keith Runcorn at the University of Cambridge in England. Gillian Turner herself was an undergraduate at Cambridge; indeed in an essay she wrote there on 'our magnetic planet' one can see the genesis, decades later, of this fine book.

Gillian Turner has thus walked on paths where many of the past giants of geophysics have walked. This familiarity perhaps gives her the feeling of friendliness with them which comes through in this book. She has a great interest in, knowledge of, and gift for writing about the history of science. The depth of research and understanding in the book carries a great enthusiasm with it. It cannot help but teach the reader much about modern geophysics. It is just the book to enthuse a young person, interested in the physics of the world around them.

It is a book on geomagnetism, and indeed wider geophysics, quite like no other. It is aimed at a wide audience, and maintains a high level of academic rigour. Its purpose is to tell a remarkable story about the discoveries and observations of magnetic fields. The story can be traced back to mankind's earliest recorded history, and the story covers the full sweep of human history, and especially the development of science. There is the profound sub-plot of a phenomenon, for centuries shrouded in superstition and magic, being brought into the light of explanation by modern science.

Before the Introduction there is a list of 'Main Characters'. This feature is like the programme notes of good theatre, and sets the strong literary and artistic theme of the book. In the alphabetical order of this list, Petrus Peregrinus (13th century) is followed by Paul Roberts (born 1929), illustrating beautifully how this book seamlessly joins the past and the present.

The book then very naturally tells the story in historical order. Fifteen chapters start with the myth of Magnes, and end with a very non-mythical Chapter 15 on the geodynamo. In between, we meet a whole series of giants. They come alive so well because the author has clearly done her own research regarding them, and not relied on others' accounts.

Thus, to give examples, accounts of the contributions of Gilbert (physician to Queen Elizabeth I), Halley, Maxwell, Gauss and Faraday are just some of the mileposts which lead on to the contributions, in the last fifty years, of Bullard, Irving, Morley, Vine and Glatzmaier.

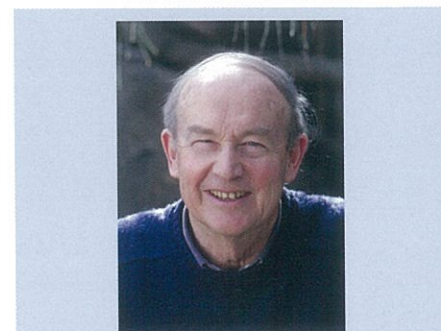
At the end of the book there is an Epilogue, a Glossary and a Short Bibliography. A beautifully selected collection of historical illustrations grace the text.

The author reflects her natural outstanding teaching abilities in the apparently informal nature of the book, and its appeal to the general reader. However behind the very friendly text, with quite complicated physics explained without equations, is the firm grip of learned research, and the great care taken in the book's production.

In summary, the book breaks new ground in grafting the remarkable developments of 20th century geophysics on to the well-established history of classical electromagnetic physics. The earlier pioneers, whose names are so well known as to be perpetuated in the names of electromagnetic units, are introduced in a very likeable and human way. Then many of the 20th century scientists, who made the discoveries of continental drift, geomagnetic reversals, sea-floor spreading, and plate tectonics, are known personally to the author. These modern-day giants pick up the story which started millennia ago with the mythical figure of Magnes, and carry it through to the satisfying culmination of the (numerical) demonstration that a dynamo in the core can produce Earth's magnetic field, and its reversals.

Most people familiar with the history of geomagnetism will have their background knowledge significantly deepened from this book. The student will gain a wonderful perspective of the development of science, by following the thread of magnetism through much of the recorded history of mankind.

This book is very timely. We are now one decade into the 21st century, and the 1900s are 'last century'. It is indeed time for the historic developments in geomagnetism, which occurred particularly in the latter half of the 20th century, to be welded-on to the established physics which last century's students knew well: the physics of Coulomb and Ampere and company. This book does this welding-on in a very learned and seamless way. The research behind the history has been painstaking.



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