

Bookshelf

Origins: Selected Letters of Charles Darwin 1822-185

Frederick Burkhardt, Stephen Jay Gould

ISBN: 9780521898621

£17.99, 286pp

Evolution: Selected Letters of Charles Darwin 1860-1870

Sir David Attenborough, Frederick Burkhardt, Samantha Evans and Alison Pearn

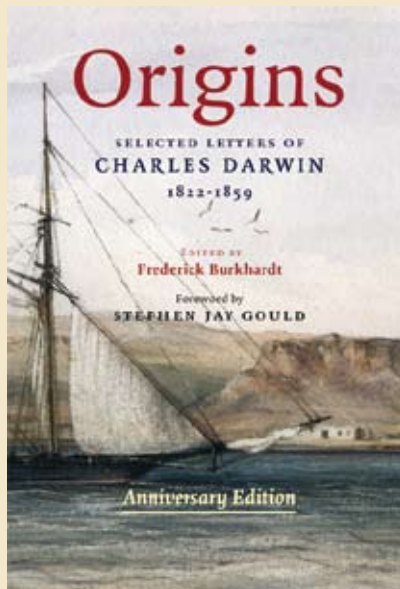
ISBN: 9780521874120

£17.99, 336pp

Both published by Cambridge University Press

Darwin is arguably the most influential scientist who ever lived. As we celebrate both the bicentenary of his birth and the 150th anniversary of the publication of *Origin of Species*, interest in his life and work is as great as ever. This is reflected in the amount of literature detailing Darwin's life and work. This incorporates a number of biographies, explanations of his (and Wallace's) theory of evolution by natural selection alongside Darwin's own writings on a number of subjects. One of the most remarkable elements of this literature is the *Correspondence of Charles Darwin*, which currently runs to fifteen volumes. Marvellous as it is, the cost and size of this collection puts it beyond the means of the ordinary reader. Hence there is strong need for a compendium and the two books reviewed here present a selection of letters from these volumes both to, and sometimes from, his many and varied correspondents.

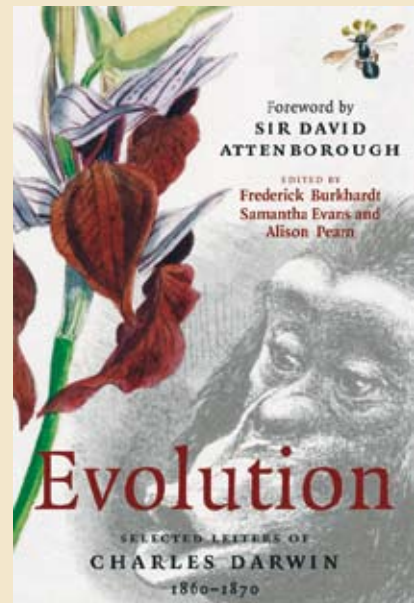
Arranged chronologically, the first volume, *Origins*, ranges from his earliest letters as a schoolboy through the Beagle voyage and the work it generated, up to the tumultuous year of 1859 with the publication of the *Origin of Species* and its immediate aftermath. The second book, *Evolution*, covers the following highly productive decade closing on the eve of the publication of the *De-*



scent of Man.

Unsurprisingly Darwin is chiefly celebrated for the *Origins of Species*. However the letters remind us of the sheer brilliance of the man, with letters relating to his pioneering work in geology, taxonomy (of barnacles), sexual selection and plant fertilisation. Darwin's understanding of the importance of experimental data also emerges alongside the need for repeat measurements before conclusions can be drawn. Also evident is Darwin's pleasure in his family and the anguish that this sometimes brings.

In a letter to J. J. Weir in 1868, Darwin commented that, "If any



man wants to gain a good opinion of his fellow men, he ought to do what I am doing, pester them with letters". The judicious choice of letters presented in these two texts reveal the truth of Darwin's statement, as his personality and trains of thought are revealed. His geniality, thoroughness and tenacity as he progressed as a scientist also shine through. Furthermore the letters offer a wider insight into the development of science at a key moment in history. They are both highly recommended.

Paul Ashton

Trees, Truffles and Beasts – How Forests Function

Chris Maser, Andrew W. Claridge
and James W. Trappe
Rutgers University Press
ISBN: 9780813542263
£19.50

280pp

This book takes an interdisciplinary approach to the study of the forest floor and the soil of forest ecosystems. It specifically covers the two contrasting regions in which the authors have had first hand experience, the Southeastern mainland of Australia and the Pacific Northwestern United States. As the importance of forests in carbon sequestration and potential carbon trading is now generally acknowledged, this book provides a valuable source of information to study the contribution of the biota of the forests.

The book covers animals and micro-organisms, with a special emphasis on mycorrhizal fungi. It is written in an interesting and engaging style with colour and black and white plates, along with some excellent schematic cartoon diagrams of how the biota can influence trees. It is not quantitative in its approach which makes it easy reading for a wide range of people at all levels. At such a reasonable price I recommend its purchase by students, policy makers and the intelligent layman.

Jim Lynch

Urban Regions: Ecology and Planning Beyond the City

Richard Forman
Cambridge University Press
ISBN: 9780521670760
£27.99

408pp

‘One of the great challenges of human history has appeared, the giant urban region’. So writes Richard Forman, co-author of the influential early book on landscape ecology (Forman & Godron, 1986), in his Preface to *Urban Regions: Ecology and Planning beyond the City*. At the heart of the book is the concept of the urban region, the 150 – 200 km diameter area in which a major city and its surroundings interact to form a functional region. Forman’s ambition is to bring the spatial context of landscape ecology to the critical problems facing city

Arctic Fox: Life at the Top of the World

Garry Hamilton
A & C Black
ISBN: 9781554073412
£16.99

232pp

‘A glorious, friendly, playful creature’ is how author Garry Hamilton acknowledges the appeal of his subject, a ‘tiny furbearer’ and icon for beauty. Indeed, the arctic fox even won the hearts of hardened early explorers, so much so that they often made them into pets.

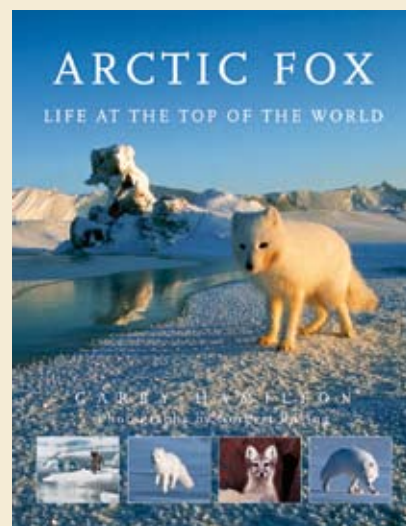
The arctic environment can be severe and extreme, so how is it that the arctic fox manages to dig a den in land locked permafrost up to 1.5km deep? How does it cash in on neighbours who are polar bears, and thrive in the harshest of conditions? *Arctic Fox: Life at the Top of the World* describes in detail just how nature’s ultimate survivor succeeds in keeping warm, dodging enemies, finding food and raising a family in 90 days or less throughout the arctic, on nearly every island as well as on the polar ice cap within miles of the North Pole.

One of the pleasures in writing about arctic foxes, the author mentions, is that biologists are always willing and eager to talk about their work. This is encouraging news! Hamilton interviewed many arctic fox researchers while compiling his

high quality book and as a result he has succeeded in portraying life from the point of view of the arctic fox. He presents us with a very readable and fascinating insight into its life and evolutionary history, complemented by beautiful and captivating colour photographs by Norbert Rosing.

Hamilton ends by pondering upon the fate of the arctic fox, now challenged by the northward invasion of the larger red fox, and asks what will happen if global warming means that there is no longer any arctic in the future.

Susan Omar



regions in the near future, what Forman refers to as the *urban tsunami* of water scarcity, species extinction and climate change. The core of the book is based on the analysis of 38 urban regions from 32 countries around the world. Landsat satellite imagery in combination with expert knowledge and ancillary data is used to generate 26 attributes (‘site types’) for each urban region. These data are analysed to discern spatial patterns relating to nature, urban food and water. This analysis provides the raw indices – number and connectivity of patches of natural habitats, land use around rivers and streams, extent, type and pattern of urban cropland etc. – from which conclusions about the sustainability and resilience of each of the selected city regions is evaluated.

This is an important contribution to the critically important debate about the future planning and

management of world cities at a time when their population will increase by 2 billion over the next 20 years. Landscape ecology has an important part to play in this debate and the book is a timely, if not always tightly structured, attempt to demonstrate the significance of a spatial and ecological context to solving the problems that lie ahead.

Geoffrey Hugh Griffiths

Exploring Animal Social Networks

Darren P Croft, Richard James, Jens Krause
Princeton University Press
ISBN: 9780691127521
£19.95

185pp

This is definitely not a book for the quantitatively faint hearted. To

the informed biologist the first four chapters are both interesting and easily assimilated, but from Chapter 4 onwards the theme is much more mathematical and requires a good insight into both the terminology and the formulae being employed. On the back cover the authors state, “no prior knowledge of network theory is assumed...” I cannot accept this statement at face value as I have no prior knowledge of this theory and yet as a professional biologist I found many aspects of the book very difficult to comprehend. From this perspective I’m drawn to criticise the quality of some of the figures, such as those on pages, 104, Figure 5.4a, 132, Figure 6.5 and 133, Figure 6.6, I can clearly

appreciate the complexity being expressed but ask the question does the Figure enhance understanding beyond the words that the network is complicated? Sometimes in publications such as this one there is a tendency for the authors to present visual data in much the way that they would in writing a scientific paper, rather than in considering the wider audience that might be attracted to reading the book and for whom a simpler representation would suit. Perhaps I am being unfair to the authors and should direct my comments to the editor and the publishers?

Overall I did not enjoy this book because I felt overwhelmed by the minutiae and thus have not learned

as much as I was hoping to about this undoubtedly fascinating topic.

Stephen Hoskins

Analysis of Evolutionary Processes: The adaptive dynamics approach and its applications

Fabio Dercole and Sergio Rinaldi

Wiley

ISBN: 97800691120065

£38.95

333pp

I started this book with high hopes, and they were realised in a good introduction, not only Darwin and Wal-

The Voyage of the Beagle – Darwin’s extraordinary adventure aboard FitzRoy’s famous survey ship

James Taylor

Conway

ISBN: 9781844860661

£20.00

185pp

Darwin wrote in his Autobiography “*The voyage of the Beagle has been by far the most important event of my life ... the first real training or education of my mind. I was led to attend closely to several branches of natural history; and thus my powers of observation were improved.*” It is so easy for us to think about ‘Darwin’s Beagle’ and to minimise the role of Vice-Admiral Robert Fitz-Roy and to forget that this was the third vessel of the Royal Navy to be named Beagle. James Taylor writes from vast experience of maritime history and Victorian paintings. He provides much information on fascinating aspects unfamiliar to most biologists. In this volume Darwin is only mentioned briefly in the first three chapters – which deal with the origin and design of the ship, Robert FitzRoy and the Officers and Crew. Then halfway through the book Darwin’s part is explained and we have an interesting account of the 1831-1836 circumnavigation with the momentous five weeks spent surveying the Galapagos islands. There are also chapters on the artists travelling with Darwin on the second of Beagle’s three survey expeditions and on the art of surveying the sea.

HMS Beagle was built at Woolwich as a 10 gun two-masted Brig at a cost of £7803 and launched in 1820 as a small multi-purpose fighting ship. However, before her first survey voyage in 1825 she was converted to a three-masted barque. FitzRoy was its second captain and he selected the ‘Philosopher’ (or Philosopher – as Darwin was known on board) as an unpaid companion – in fact Robert Darwin spent more than £1500 on his son’s expedition.

Taylor demonstrates appreciation of FitzRoy’s hydrography and presents interesting insights into Darwin’s collection of scientific information and also into his relationships with the ‘76 souls on board’.

This is a worthy addition to this year’s publication and it is a lovely book to handle – good quality paper and superb illustrations – drawings and paintings of portraits and landscapes. And at £20, it must rate as a book bargain!

Alan Cadogan

99% Ape – How evolution adds up

Jonathan Silvertown (Ed)

Natural History Museum / Open University

ISBN: 9780565092313

£14.99

224pp

A book co-published by the Natural History Museum and the Open University is bound to have considerable readership reach. In this case it will be as a textbook for the OU

short (10 week) course *Darwin and Evolution* and also as the handbook for the Museum’s bicentennial tribute to Charles Darwin. In addition it is being included in the Wellcome Trust’s *Survival Rivals* kits which are available free to all state secondary schools in the UK.

The book is a splendid collaboration by OU experts: an evolutionary ecologist, a palaeobiologist, a Planetary and Space Scientist, a Comparative Anatomist, an evolutionary biologist and the Professor of Law who has a longstanding interest in legal battles over the teaching of Darwinism in the USA. It is richly illustrated; explaining modern evolutionary theory and its relevance to current issues and it explores the genealogy of living things. Additional chapters bring Darwin’s theory up to date covering: species diversity including the classic tale of Darwin’s finches; evolutionary psychology and the human mind; the question of morality; and the problem with ‘intelligent design’. There are some details of Darwin’s own life and work throughout - as well as a number of fascinating evolutionary case histories, including plant evolution, snail banding, the development of vision, and the implications of the battle between pathogens and host organisms.

99% Ape is an excellent introduction to the discussions of the Darwin year. It will stimulate further reading on the topics touched upon – particularly, perhaps, the significance of the remaining 1%.

Alan Cadogan

lace, but also Matthews! But then the book goes off the rails completely, so far as biology is concerned. I should have got a clue from the back cover, where it says "...focuses on evolutionary processes driven by rare and small innovations." This might be fine, looking at a Neo-Darwinian biology and avoiding – post-Neo-Darwinian – the fact that we are all about 10% heterozygous and that a third of genes have variants (i.e. that many ancient mutations are still with us).

There is room for another book there, if it has something new to say. This one does, but it's nonsense biologically, and perhaps also in the other spheres it attempts to explain, such as economics and demography. The authors generate a complicated equation they call the Adaptive Dynamics Canonical Equation, which is a way of bewildering the reader about mutation rate. They then apply this equation, and its non-linear arguments, to such chapters as "Evolutionary Branching and the Origins of Diversity", "Multiple At-

tractors and Cyclic Evolutionary Regimes" (which includes a 'catalog of evolutionary scenarios' that is meant to explain economic theory) up to "Evolutionary Chaos", which includes Red Queen scenarios and a Lotka/Volterra system with three participants! So far as I can see, the Adaptive Dynamics approach can play some fine and fancy mathematical games, but their relevance to the real world, especially real-world biology, is zilch!

Jack Cohen

The Buzz about Bees: Biology of a Superorganism

Jürgen Tautz

Springer

ISBN: 9783504787273

£23.00

283pp

Scientists are for ever trying to unravel the mysteries of the honeybee

and this exposé is no exception. In its attention to detail fine works such as Maurice Maeterlinck's *The Life of the Bee* (1901) and John Free's *Bees and Mankind* come to mind. The author works at the Institute of Behavioural Physiology and Sociobiology at the University of Würzburg, Germany and this book, translated from the German, is magnificently illustrated with colour photographs on all spreads. It offers an up-to-date overview of the world of the honeybee and is probably the only book you will need to understand the current science of honeybees. It will be useful as a library reference, for project work and for higher level students including undergraduates.

One imagines how Maeterlinck's book might have been made inspirational through the addition of amazing close-up colour photographs; he told us how many hairs there were on a bee's body. This new book lets you into the secret of the honeybee's genome and provides a window, via thermographic images, into the com-

Mabberley's Plant Book - A Portable Dictionary of Plants, their Classifications, and Uses (3rd Edition)

David J. Mabberley.

Cambridge University Press

ISBN : 9780521820714

£50.00

1040pp

This new edition is a very welcome update on the 2nd edition of 1997. In the Introduction, the author describes how popular interest in plants has grown in recent years, to include exotic foods, herbal remedies, even ecotourism. People with little botanical knowledge are faced with unfamiliar and often confusing information from books, periodicals and the Internet. In addition, the world of taxonomy is not static: plants are often shunted about between Genera when new information comes to light. This is not just for the peace of mind of Taxonomists. Knowledge of the relationship between plants can be vital in agriculture, for example, breeding pest resistance in a crop.

Mabberley is quite right to assert that the growth of molecular data, especially DNA sequences, is less of a revolution in Taxonomy than might be supposed. In many cases, DNA analysis has been consistent with older classifications based on tradi-

tional morphological data. In others, however, use of molecular data has brought several small genera together into a monophyletic group, reflecting their true genealogy.

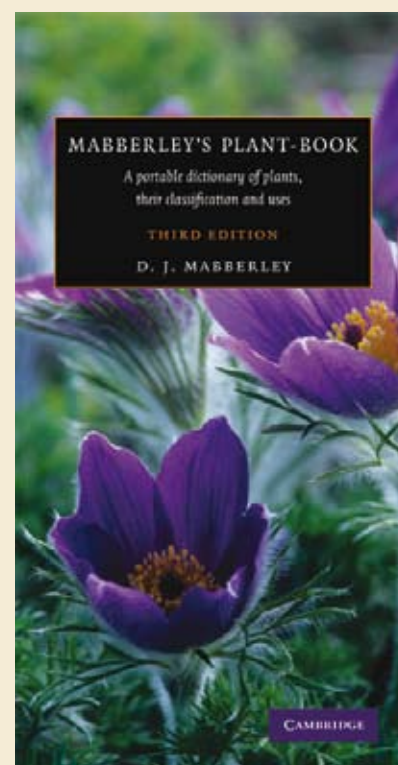
In the text, he maintains the older, more familiar names for several plant families, for example, *Gramineae* rather than *Poaceae*, and has increased the number of vernacular names, as more and more come into general use. This again reflects the global interest in plants. In addition to the 1650 new entries, almost all the original ones have been updated as data from newly published work has become available. Economically and ecologically important mosses are included for the first time as are the stoneworts (now known to be closely allied to land plants).

The Appendix lays out a modern classification system for plants. Changes from the previous edition are noted, so the reader may comprehend the greater understanding we now have of the evolutionary relationships between plants.

Mabberley has followed earlier editions in including some humour 'during the tedious preparation of

this book': there are 169 jokes hidden in the text!

Leighton Dann



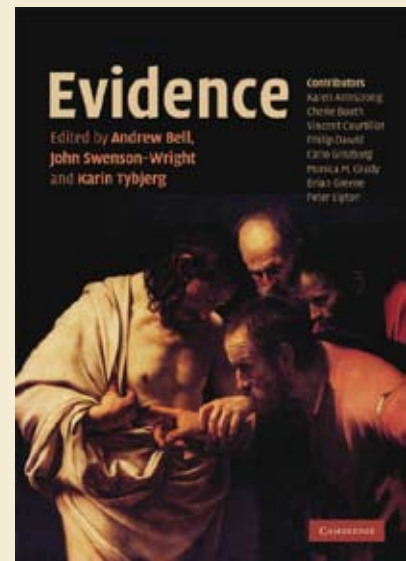
Evidence

Andrew Bell, John Swenson-Wright,
Karin Tybjerg (Eds)
Cambridge University Press
ISBN: 9780521710190
£12.99

202pp

Politicians, scientists, historians theologians, lawyers – all appeal to “evidence” with which they seek to convince the rest of us but alas, very few people know what evidence really is. Indeed, as described by these eight essays, based on public lectures at Darwin College, evidence means very different things in different contexts – and the failure to distinguish the different kinds is the source of much confusion and rancour. Thus Richard Dawkins mocks the American Christian fundamentalist Creationists, while the fundamentalists in turn seek scientific “evidence” for their beliefs by mounting expeditions to find the remains of Noah’s Ark. Nonsense

on both sides, says Karen Armstrong. Neither side has appreciated Plato’s vital distinction between *logos*, that body of ideas that lend themselves to rational analysis and empirical observations, and *mythos*, that body of insights expressing more elusive yet fundamental truths as poetry and allegory. Philosopher Peter Lipton points out that human beings instinctively strive to summarize the world around them in the form of stories (which, I suggest, is a survival tactic common to all animals), and our innate love of a good narrative tends to take over. We think in the spirit of *logos* that we are building our world view from the “facts” of the universe which we call “evidence”, but in truth, to a large extent, we tend to select only those “facts” that help to reinforce our preconceptions. This is true in science as in life in general: “objectivity” is a slippery beast.



Most enjoyable. Very thought-provoking. Important.

Colin Tudge

plex life of this superorganism. Science moves fascinatingly onwards.

John Feltwell

Animal Intelligence: from Individual to Social Cognition

Zhanna Reznikova
Cambridge University Press
ISBN: 9780521532020 (paperback)
£31.99

472pp

Reznikova’s new book costs £32 – for a paperback. Hmm. So, is it worth it?

When authors write about ‘animals’ they sometimes mean mammals, and often mean vertebrates; Reznikova embraces invertebrates too, which is good news, though she doesn’t go below the ant. No rotifers or protists here. The sweep is broad, and the approach is open and refreshing.

The only existing books on animal intelligence come from a strictly Western standpoint. The author is Russian, lives and works in Siberia, and is on the staff of the State University of Novosibirsk. The result is a grand overview, containing many items of Russian research that are rarely encountered in the West, like Firsov’s work with chimpanzees. On the other hand, some Western

work is omitted altogether, like Jürgen Lethmate’s studies at the Westfälische Wilhelms-Universität, Münster, unless that’s because handling the accents poses a problem.

There are 37 chapters in this 472-page book, with a huge bibliography covering almost 50 pages. You’d think it was a multi-authored tome, but no, it is all done by Dr Reznikova. Her descriptions of such subtleties as conditional discrimination and reversal shift, the many means of navigation used by migrant species, cognition and the use of tools is fascinating and reasonably thorough. There are adequate photographs and line illustrations, and the style is refined and easy to follow.

Quibbles would be small. I keep feeling that she embraces under the category of ‘intelligence’ too much by way of instinct and learning, which are separate subjects. But this serves to set the topic in a broader context, and the overall impression is of remarkable authority and a profound understanding by the author of how animals work. When I look at the remarkable abilities of single celled organisms I feel her looking over my shoulder. She informs one’s understanding, and reminds us that some wonderful work is being done far away from Western laboratories.

Brian J Ford

Alternative Reproductive Tactics: An Integrative Approach

Rui F. Oliveira, Michael Taborsky,
H. Jane Brockmann
Cambridge University Press
ISBN: 9780521540063

£38.00

507pp

A veritable biological soap opera involving sexual conflict, bourgeois and sneaker males, eavesdroppers, deceptive practice and dishonest signalling: even to the novice, the subject material of this book is fascinating.

Essentially dealing with the alternative reproductive behaviours adopted within a population across a variety of animal species, the authors divide up this compendium into four sections (the evolutionary origins, the physiological mechanisms, a taxonomic review and emerging perspectives of alternative reproductive tactics). Being well structured and clearly written with illustrative diagrams and excellent examples, they truly have achieved what they set out to do – namely, to provide a “reference for postgraduate courses” in animal behaviour, evolutionary theory and ecology to name but a few.

To this end, the synoptic chapter, which also reflects on what is yet unknown, finishes the book making it an invaluable source of informa-

tion, if not inspiration, for the budding PhD student. What is more, the small typescript is suited to the younger amongst us – not only as their eyes can cope better but because more information can be crammed in equating to good value!

However, this book might not necessarily be limited to that audience. The chapter on “Modeling alternative mating tactics as dynamic games”, although beyond me mathematically, proved interesting in terms of recognising the complexities of an animal’s reproductive decision making (e.g. the physiological state, environmental conditions, time constraints). Similarly, challenging the concept of an alternative reproductive tactic (Chapter 19) proved a refreshing read.

Cheryl Loughton

Carrots and Sticks – Principles of Animal Training

Paul McGreevy and Robert Boakes
Cambridge University Press
ISBN: 0521686911

£45.00

283pp

A capuchin monkey, a predator, extends her hand and offers a mouse a sweet. The book’s cover photograph is another illustration of the well-known fact that animals can be trained by humans to perform a variety of extraordinary behaviours. The authors’ stated goal is to take the mystery out of training, by describing the techniques used (including punishment and negative reinforcement as well as the more acceptable positive reinforcement). They provide step-by-step case studies of how to train companion, exotic and working animals to perform specific behaviours, but emphasize that these training practices are not models for readers to emulate, and ask that readers decide for themselves whether it is right or wrong for animals to be trained like this. Much of the text is devoted to general principles, introducing terminology with plentiful well illustrated examples. Accurate timing and mechanical consistency, combined with a thorough understanding of learning theory and the animal’s natural history (propensities and limitations), are the key principles advocated for successful training. *Carrots and Sticks* is not referenced in the text and contains a very select bibliography. But that is not to say it won’t be of great value

Charles Darwin: The ‘Beagle’ Letters

Frederick Burkhardt (Ed)
Cambridge University Press
ISBN: 9780521898386

£25.00

544pp

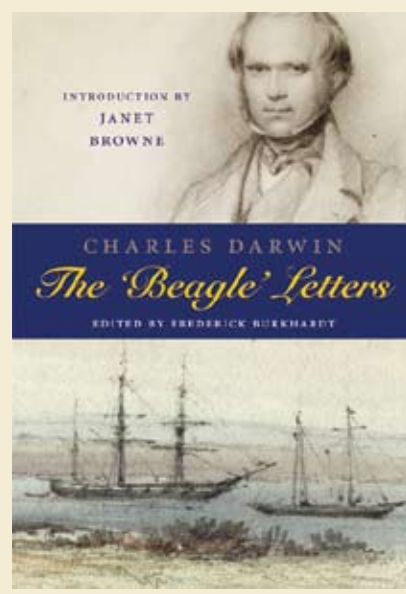
George Peacock cannot have known how true his words would prove to be when stating that ‘it would be a serious loss to the cause of natural science, if this fine opportunity [for a naturalist to join the Beagle expedition to Terra del Fuego and the East Indies] was lost.’ John Henslow, Darwin’s university professor and friend, viewed Darwin not as ‘a finished Naturalist, but as amply qualified for collecting, observing & noting any thing worthy to be noted in Natural History,’ whilst Captain FitzRoy, whose decision it ultimately was to offer or deny Darwin a place on board wanted ‘more a companion than a mere collector & would not take anyone however good a Naturalist who was not recommended to him likewise as a *gentleman*.’ How fortunate it is then, that Fate should determine Darwin to be the chosen one.

For Darwin’s 200th anniversary, a plethora of books about the great man and his works is being published, but this one is truly a gem. It conveys with great charm Darwin’s personality, his youthful enthusiasm and touching relationships with

family and friends. One experiences with him the highs and lows, the excitement, the trepidation and pure academic interest. Like a drama, one is held in suspense, wanting to know the next instalment of the story.

Complemented by many charming watercolour and pencil sketches by Conrad Martens, who travelled with Darwin on the Beagle, and thoughtfully introduced by Janet Brown, this book will certainly appeal to all.

Alice Young



to students, in addition to trainers. It is an accessible and shrewd account of animal training, providing a foundation of the need to understand instincts, biological constraints on learning, the role of early experience and individual differences in order for trainers to learn how to work effectively with predictable responses.

Hannah M. Buchanan-Smith

Birds of Trinidad and Tobago

Martyn Kenefick, Robin Restall, Floyd Hayes
Christopher Helm
ISBN: 9780713685442

£17.99

256pp

This is a comprehensive and portable field guide to all the birds of Trinidad and Tobago, it is aimed at the tourist who has a strong ornithological interest.

The opening sections cover the geography and climate of the islands

which in turn influence the diversity of the ecosystems found there and hence the great range of habitats available for birds. Advice is given to the identification of birds and their individual variation along with a glossary of terms and two very useful labelled diagrams of the external features of birds. More importantly there are 7 pages devoted to where the observer should watch the birds and which species he is likely to find at each location.

There are 107 colour plates with very good illustrations of all 470 species found on the islands including vagrants. For each species there is a concise description highlighting plumage variation, voice, status and distinctions from similar species. The birds are grouped conveniently into families with coloured headers for easy access and use. If ever I were to visit these islands then I would most certainly include this conveniently sized book in my luggage!

Jean Wilson