

book reviews

***Fire on Earth, An Introduction*, Andrew C. Scott, David M.J.S. Bowman, William J. Bond, Stephen J. Pyne and Martin E. Alexander (eds), Wiley-Blackwell, Oxford UK, Hoboken USA, 2014, references, term index, pp 413.**

The book has a companion website: www.wiley.com/go/scott/fireonearth

This year the renowned British publishing house Wiley-Blackwell has come out with the above, long-awaited and exceptionally valuable work, under the authorship of five scientists representing the UK, Australia, South Africa, the USA and Canada. The men in question are **Professors Andrew C. Scott, David M. J. S. Bosman, William J. Bond and Stephen J. Pyne**, as well as **Dr Martin E. Alexander**. The graphic side of this book has been prepared painstakingly and there is a wealth of documenting material; while – as the *Introduction* emphasises – the authors referred to have a wealth of knowledge, experience/expertise and publications output in fields relating to fires. Indeed, they have been working on these issues for many years at their respective institutions: the Universities of London, Tasmania and Cape Town, as well as Arizona State

University and the University of Alberta-Edmonton.

The text overall is assigned to four roughly equal parts that are by no means arbitrary in terms of either content or structure. Each part ends with its own separate references section.

Specifically, it has been the intention of the authors (as formulated in the aforementioned *Introduction*) to:

- establish the autonomy and longevity of fire on Earth;
- centre its dynamics in the living world;
- emphasise the critical presence of fire for humanity, and of humanity for pyrogeography;
- have fire's behaviour serve more as an integration of factors, and hence a summary, then as a putative foundation for everything else.

Part one of the book (of 103 pages) is entitled *Fire in the Earth System* and comprises five sub-parts entitled:

- *What is fire?* (45 pages);
- *Fire in the fossil record: recognition* (16 pages);
- *Fire in the fossil record: Earth system processes* (7 pages);
- *The geological history of fire in deep time: 420 million years to 2 million years ago* (16 pages);
- *The geological history of fire – the last two million years* (10 pages).

Part two (76 pages) entitled *Biology of Fire* is divided into a further five parts familiarising the reader with fire processes in the living world. The chapters are as follows:

- *Pyrogeography – temporal and spatial patterns of fire* (18 pages);
- *Plants and fire* (15 pages);
- *Fire and fauna* (8 pages);
- *Fire as an ecosystem process* (12 pages);
- *Fire and anthropogenic environmental change* (16 pages).

Part three (of 98 pages), entitled *Anthropogenic Fire* takes in 3 parts entitled:

- *Fire creature* (34 pages);
- *A new epoch of fire in the Anthropocene* (26 pages);
- *Fire management* (30 pages).

Finally, Part four (102 pages) on *The science and art of wildland behaviour prediction* comprises:

- *Fundamentals of wildland fire as a physical process* (42 pages);
- *Estimating free-burning wildland fire behaviour* (31 pages);
- *Fire management applications of wildland fire behaviour knowledge* (17 pages).

Those authoring the content of the different chapters offer examples of particular fires occurring in different areas of the globe, the documentation being aided by helpful and informative colour photographs and maps.

Overall, this book may be counted among the group of key monographs addressing a very wide range of issues, albeit with a common thread. To be found here is historical and palaeogeological information concerning biomass fires “registered” in carbon residues in sedi-

ments dated by reference to C_{14} carbon isotopes. Analysis of past fires is used to assess the intensity of processes degrading or damaging the biosphere, zoosphere or pedosphere. There is wide-ranging treatment of human activity, with reference made to the new era of fires that the Anthropocene represents.

Information and rapid early warning systems used in securing areas against fires are proving to be ever-more effective, though the number of natural fires, and those caused by human carelessness, remains large, especially during the (April-October) growing season in our climatic zone, and in suburban areas.

Fires are among the natural disasters capable of threatening the persistence of the biosphere, with this issue assuming particular significance when global warming and the attendant trend for greater numbers of fires covering ever-larger areas are recalled. This is happening irrespective of the fuller and fuller use being made of fire-detecting and extinguishing technologies, also taking advantage of satellite imagery of better and better quality and resolution. But the weather anomalies favouring persistent droughts give rise to more and more frequent fires, and thus to attendant losses as and when areas or objects are vulnerable to the flames. In truth, this particular strand to the overall issue does not receive too strong a presentation in the book. Rather the authors concentrate on presenting the theoretical underpinnings of fire in the fields of physics and chemistry, as well as such applied aspects as early warning. There is also very broad discussion of the consequences of fire in the biotic and abiotic environment.

The book presented is a publication offering a good approximation of our current knowledge on fires on the Earth, as it is conceptualised in terms of the contemporary scientific discipline **pyrogeography**, which somehow exists where geology, physics, atmospheric chemistry and biology all meet, to say nothing of the technical, social, economic and ecological sciences that are all completely relevant to the topic. Yet such a broad scope is essential if new policy for the sustainable development of the planet over various different temporal and spatial scales is to be pursued. This is what makes this book so important, and

of significance to the continued short- and long-term existence of our species, from small communities up to humankind as a whole. There is certainly much here to interest researchers from various professions and with a wide range of specialisations. The ecology-related subjects dealt with are likely to represent a fruitful field of research for geographers too, as are the issues concerning both technological progress and the systems by which fires can be analysed from both the temporal and spatial points of view. Hence, the value of recommending this publication to them.

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