

Mushroom, by Nicholas P. Money, Oxford University Press, Oxford and New York, 2011, 201pp, b/w photos and diagrams, 15 col pls, page notes, index, Hbk £14.99. ISBN Hbk 978-0-19-973256-2.

The author, who is Professor of Botany at Miami University, points out that fungi, relative to other natural groups, have been little studied scientifically. Of course, as fungi are not plants, one could ask if a botanist is really qualified to write on the subject! Even so, the author maintains that mushrooms are ‘the most wondrous inventions of the last billion years of evolutionary history on earth’ so, clearly, he feels that he has a compelling story to put forward. Certainly he champions fungi and marvels at the speed with which mushrooms appear in a meadow; he describes how their growth is ‘pneumatic, with the inflation of preformed cells from a button, extending the stem, pushing earth aside.’

The book has eight chapters, which can be read as separate essays; the writing is never dull, such is the enthusiasm given to the subject, while each chapter has a few page notes, relating to research papers or items of historical or literary interest. The index is useful, but it must be remembered that several of the fungi mentioned are American species. But fungi have similar and often surprising properties in whatever continent they may be found; thus, a single mushroom gill can shred 30,000 spores in one second and one spore might even spawn one of the largest organisms on earth, even up to 35,000 tons in weight. I do hope that Professor Money has done his sums correctly! Perhaps as expected, the author is fascinated by a variety of fungal structures to be found, ranging across resupinates, cages, brackets, puff-balls, agarics, cups or jellies, several with suitable illustrations of historical interest. The illustrations were largely obtained from the Lloyds Library in Cincinnati; the well chosen plates are taken from British, Danish, French, Japanese, and American sources, so confirming the international interest in fungi and their artistic value.

In the first chapter, circumstances necessary for the germination of a fungal spore are discussed, concluding that exact conditions for success are very limited. The spore might pitch where necessary nutrients are lacking, the spore might be eaten by a slug, amoeba, or springtail or it might be poisoned by competing fungal species. In nature, these problems are balanced by the vast number of spores produced by fungal fruiting bodies; indeed, some puff-balls produce trillions of spores yet fields never get covered entirely with puff-balls. Some fungal spores evidently need association with yeasts or other agents, or even passage through a mammal’s alimentary tract, before germination is possible; apparently, the spores of many fungal species have never been germinated successfully in the laboratory. In the same chapter, I enjoyed the author’s historical survey of discoveries of fungal structure, leading to the modern idea of the nature of fungi as group. At present, fungi are considered to be a sister group to animals, with both related only distantly to plants. Surprisingly to me, tribute is paid to Beatrice Potter, author of children’s books, as an expert mushroom artist, and also as a pioneer mycologist; her research work, involving microscopy, was dismissed at the time by botanists at Kew and the London Natural History Museum as being of little value. Professor Money, however, feels that Beatrice was badly treated; at that time, few women were thought capable of scientific work!

Importantly, spore development is considered in relation to the latest scientific research, leading to thoughts on the development of a complete agaric. Then regarding the function of hyphae, an expert scanning electron micrograph of hyphal tips illustrates the feeding structures of fungi; without doubt, structure is always related to function in nature. Growth of an agaric is further discussed with the aid of computer simulation; doubtless this line of research will be of increasing importance in the future. The author’s treatment of this complex subject is laced with humour; for him, mycology is clearly an obsession.

The diversity of form amongst fungi seems remarkable, when thinking of gills, spines and tubes as spore-producing structures, but spores are also formed by brackets, stinkhorns, earth-stars and bird's nests. The evolutionary details and processes involved are quite 'breathtaking' according to the author. These days, diversity is studied using DNA sequences; the author feels that this work is drudgery, but I think he does concede its value! As expected, the importance of fungal association with certain trees and plants for optimal growth is stressed, but what factors stimulate good fungal growth? This is obviously a very complex subject; however, I was surprised to read that Japanese researchers are using high-voltage bursts of electricity to try to boost growth in certain mushroom crops. What about lightning strikes?

I liked the chapter on mushroom poisons. I had not heard previously that the yellow knight agaric, of Europe and America, can cause destruction of muscle tissue, coma and heart failure. Yet this fungus, common in France, has been listed as a good edible species but, if eaten in quantity and over a few days, symptoms may set in; at Bordeaux in the 1990s several people required hospital admission. Apparently, there were three deaths, all with evidence of muscle breakdown. The toxin was not identified. Poisoning by webcaps, of which there have been several well-documented cases, must be caused by a different toxin which affects kidney tubules and the liver while the deadly toxin of the death-cap, a cyclopeptide chemically, attacks the liver.

The question is why have some fungi evolved to produce such specific and powerful toxins? I suggest that you read this entertainingly written book for a useful discussion on the issue. Although the author works in North America, his childhood was spent in England, which may account for his several references to British mycologists and rural fungal lore. It is stated that the number of described mushrooms is now some 16,000, so if anyone has an idea of becoming an expert mycologist, the prospect is rather daunting!

PHILIP RADFORD

Climate and Weather, by John Kington, Harper Collins, New Naturalist Series, 2010, 484 pp, numerous maps, charts, b/w and col pls, £30 Pbk, £50 Hbk. ISBN Hbk 978-0-00-718501-6, Pbk 978-0-00-718502.

The state of the weather determines whether plants are able to grow and thrive, and it influences all animal behaviour, including that of man; Gilbert White obviously understood this, maintaining that the weather of an area was part of its natural history. A previous book on weather in the New Naturalist Series was published in 1952; this was Gordon Manley's *Climate and the British Scene*, which ran into several impressions. However, with increasing knowledge of meteorology and the problems of climate change, it was thought that a new book on the subject would be welcomed. The author, John Kington, has worked as a meteorologist at the Meteorological Office, and latterly has been researching historical climatology at the University of East Anglia.

The book is divided into two parts: the first describes scientific methods in the study of climate and weather, while the second gives a historical account of the climate, sometimes year by year, since the 1st century BC up to AD 2000. Anyway, it seems that the British climate shows such variation that it has been said that the British Isles have no climate, but merely weather! Still, people love to talk about the weather and, as Samuel Johnson remarked, when men meet they tell each other what they know already, 'that it is hot or cold, bright or cloudy, windy or calm'. As expected, the author defines basic aspects of climatology, including barometric pressure, temperature, humidity, wind and precipitation;

also, there are clear accounts of topics such as frost and frost hollows, the growing season, freezing fog and rime, and heat islands.

I found the chapter on the atmosphere and its circulation helpful, while conditions leading to the onset of hail, snow, fog, rainbows and electrical storms are well described. Then, several impressive weather facts are stated: for example, it appears that a lightning flash may heat the surrounding air to as much as 15,000 degrees C. As I had expected, there are plenty of weather charts and maps to consider but, even for the general reader, they are fairly easy to understand. The significance and importance of westerly winds over the British Isles is stressed, illustrated by histograms linking frequency and year, showing a decline in incidence since 1950; moreover, the effects of volcanic eruptions and dust production on current and subsequent weather are usefully discussed. Of course, Pliny the younger recorded these effects back in AD 79. Further, I was pleased to see a list of notable weather observers from the 14th to the 19th centuries; these include Samuel Pepys, John Evelyn, James Woodforde and Thomas Pennant.

One chapter is devoted to cloud studies, accompanied by colour photographs which show the ten basic cloud types. Moreover, in the 19th century John Constable and JMW. Turner, as landscape painters, portrayed clouds as important features of their pictures. Another chapter is concerned with phenology which, in particular, will please botanists; phenology deals with the opening of flowers by date, but is also concerned with the appearance and disappearance of insects and animal and bird migration. Obviously, phenology must depend on climatic conditions, which affect the whole of the natural world.

Over 200 pages are devoted to climatic history, and it is interesting to read of the sources used. Thus, in the 1st century BC Julius Caesar had to abandon his first attempt at invading England when an August storm wrecked several of his ships off Dover. In the following summer, Caesar had to wait 25 days because of strong westerly winds before he could make a July landing, but soon he had to retreat once more because of another storm, and the loss of 40 vessels. However, in AD 43, the Romans under Plautius successfully invaded Britain, although severe weather conditions were noted on several occasions. In AD 69 there were heavy thunderstorms and London was partly destroyed by lightning strikes and, as recorded in *Carolingian Annals*, year 783 had so hot a summer that men died of the heat. *The Anglo-Saxon Chronicle* records that 1097 was 'over grievous from the tempests' so, clearly, adverse weather conditions are nothing new; indeed, Holinshed reported that in 1202 ale was frozen in houses and sold by weight! Centuries later, Evelyn frequently referred to weather: 1695 was said to have been a year without a summer and the winter was 'the very sharpest I have ever passed'. Probably 1695 was unusual because of a volcanic dust-veil effect. A similar effect was seen in 1815, when London saw memorable sunsets, and heavy thundery rain influenced the course of the Battle of Waterloo.

A glossary is included, for which I was grateful: could you define 'albedo', 'orographic' or 'radiosonde'? There is also a full bibliography and a serviceable index. The book is well-written and researched; climate is a subject which cannot be ignored. I recommend the work.

PHILIP RADFORD

The Status of Birds in Britain and Ireland, by David Parkin and Alan Knox, Christopher Helm, 2009, 440 pp., numerous col. pls., £50. ISBN 978-1-4081-2500-7.

This book was written to bring the last full checklist of the British Ornithologists' Union, published in 1971, up-to-date. Clearly this was necessary as there have been many recent

changes in the number of certain bird species, while there have been records of pioneer colonisers. Each author has been one time chairman of the British Ornithologists' Records Committee and both have been a long serving member of the BOU Taxonomic Subcommittee; it is difficult to think of more fitting credentials with which to carry out the difficult task of writing this book. David Parkin is Emeritus Professor of Genetics at Nottingham University, with an emphasis on avian genetics. Alan Knox is a zoologist and taxonomist and is now head of Historic Collections at Aberdeen University; he is an authority on the taxonomy of redpolls and crossbills, particularly the Scottish Crossbill. It must be realised that bird classification and species recognition is undergoing many changes at present, due to the expanding science of DNA sequencing and also the analysis of bird calls and song. Detailed studies of bird sounds have resulted in several species being reclassified as full species. Still, I was amazed to read that, as one example, more than 35 subspecies of Crested Lark have been described!

Thirty-two pages of the book are given over to colour photographs, which greatly enhance its appeal. The photographs, with good colour reproduction, illustrate several aspects of ornithology today, both academic and amateur. One rarity shown is the Aquatic Warbler, which is declining in Europe generally, but is discovered regularly on migration in southern England; then, I was glad to see a photograph of a Yellow-nosed Albatross from the Southern hemisphere and a first for England. That individual had local interest as, after capture, it was released into the wild at Brean Down. Other photographs show some declining or extinct British birds, including Willow Tit, Red-backed Shrike and Marsh Tit. The habitat photographs are well chosen, especially those which show the industrialisation of Britain's farmland; certain habitats are, of course, unique, with ancient Scots Pine forest and the bogs of the Scottish flow country as examples. Up-to-date equipment in bird identification work, as with transmitting devices and sound-recording and playback apparatus, is also shown. In addition, with regard to bird races and subspecies, there are helpful photographs of both the Shetland Wren and the Fair Isle Wren and, perhaps more commonplace, the British races of Pied Wagtail and Long-tailed Tit.

Clearly, much literature-searching went into the preparation of this work, with well over 1000 references. I found a full and useful index, while other sections include those on Britain's climate, geography and vegetation. Further, bird organisations, societies and publications are reviewed and there are discussions on the topics of bird migration, rarities and vagrants, not forgetting conservation.

The bulk of the book is taken up with accounts of all British bird species, listing taxonomy, distribution and present status. Understandably, considering time factors in preparation, some species accounts are out-of-date. As an example, for the Eurasian Bittern there is no mention of the successful nesting and spread of the bird on the Somerset Levels in the past few years; however, as the last reference for the species was in 2006, this is not surprising. Because of the time delay, there is obviously no mention of the recent introduction of Common Cranes to Somerset. Some species accounts make gloomy reading, with significant falls in the breeding populations of migrants such as Spotted Flycatchers, Tree Pipits, Willow Warblers and Turtle Doves. Population changes are certainly not always due to local conditions or to climate change, as faults may be in wintering areas or on migration routes.

An appendix lists all the bird species and subspecies as recorded in Great Britain, the Republic of Ireland and Northern Ireland, and the Isle of Man. Each species is given a category, indicating the bird's status, including introduced species and escapes from captivity. The volume contains a vast amount of information but, necessarily, this cannot always be fully up-to-date. Birds fly about and species numbers must vary from season to season, while breeding success varies with weather conditions as well as habitat changes: one

can never predict the future with accuracy for bird populations. Even so, this is a scholarly and important publication, and deserves a place in all natural history libraries.

PHILIP RADFORD

A Field Guide to Monitoring Nests, by James Ferguson-Lees, Richard Castell and Dave Leech, British Trust for Ornithology, 2011, 272 pp, numerous col. photographs, 10 information boxes, Pbk. £24.99. ISBN 978-1-906204-79-2.

The hobby of collecting eggs, traditionally carried out by schoolboys and often over many generations, was banned by the 1954 Protection of Birds Act. With so many birds reduced in numbers, and with increasingly mechanised farming practices, there is no doubt that eggging had to be stopped; nevertheless, in the past, many boys (and a few girls) developed a love of birds, and of watching them, through collecting the eggs of common birds. Without doubt, field skills in finding nests has declined; the book was written to give guidance to those with an interest in the subject, and who wish to monitor nests. I know that there are some who assert that no attempt should be made to find a bird's nest, but that means that no records can be kept. Rightly, it is illegal to damage or destroy the nest of any wild bird while it is in use, or being built, while scarce species are scheduled and receive special protection. The nest of a Schedule 1 species cannot be visited unless a licence has been obtained from the BTO's Licensing Officer. When visiting a nest, it is basically essential to keep observation time to a minimum and to take every care while searching. No tracks should be left, and cover should be re-positioned. It is important that no sitting bird should ever be startled; the safety of the bird, and of the nest, must be a priority. Originally, this book was written to help those who wish to become involved in the BTO's nest monitoring scheme.

As expected, the three authors are all expert nest-finders. James Ferguson-Lees has written extensively on the subject, especially in collaboration with the late Bruce Campbell. Richard Castell is fortunate in having received nesting and photographic tuition from his expert father, Peter, while Dave Leech knows all about the BTO's nest record scheme and its history; furthermore, Dave is adept in the use of endoscopes for looking at nests in burrows, holes in trees, or in crevices between stones. I found a useful section on search methods, including the importance of watching back; one stratagem mentioned for close-sitting ground-nesting birds, in open areas, is for two people to walk while trailing a rope between them. Close-sitting birds will be flushed, but great vigilance is necessary in marking the exact nest location! At the nest, egg shape and colours should be noted, as well as making nestling descriptions where relevant. There is a useful information box detailing chick gape colours and markings, all of help in identification.

Necessarily, most of the book is concerned with bird species accounts. Detailed information is given for each of the 146 species covered, while there are also short group accounts. Each species is allocated a time-chart, indicating the month when eggs or young are likely to be in the nest. Then, habitat, nest-site, nest structure and egg details are clearly stated, together with the lengths of incubation and nestling development periods.

Each species has a small British distribution map; in addition, there are photographs of the bird, the nest with eggs, nest with young and also a museum photograph of a typical egg. The quality of the colour photographs is excellent but, unfortunately, the dimensions are very small. Most of the illustrations are just 3cm square, so I found it helpful to have a magnifying glass to hand when reading the text. Of course, the book is a field guide, and intended to be carried in the pocket, but it is well worth reading carefully at home; I feel that it is too time-consuming, and certainly dangerous, to linger and read a book when near a nest.

Anyway, the volume is well-bound and will not readily fall apart, but intending users should not forget their reading spectacles. Clearly, the work is fully authoritative and can be recommended for use by any interested person, provided that they are prepared to examine nests in a responsible way. I expect there are some who will maintain that the book should not have been published, on the grounds that it will encourage illegal egg-collecting. However, I think that such individuals will probably want to collect eggs from the 100 or so scarce and scheduled species, and for which monitoring licences are required; reassuringly, no detailed information is given in the book for these birds. The volume itself has a very attractive front cover photograph; this shows four Skylark nestlings in down, with their gapes showing tongue spots, spurs and palate barbs: surely, this is natural design and symmetry at its best, as well as being highly artistic. Yes, I liked the book, although it is not cheap at £24.99. Even so, the text and the colour photographs are first-class, providing that elderly users have access to a good hand-lens.

PHILIP RADFORD