Reviews

Red Data Birds in Britain: action for rare, threatened and important species. Edited by L. A. Batten, C. J. Bibby, P. Clement, G. D. Elliott & R. F. Porter. Illustrated by Ian Willis. T. & A. D. Poyser, London, 1990. 348 pages; 24 black-and-white plates; 118 line-drawings. £18.00.

As sure as Wheatears *Oenanthe oenanthe* have white rumps, you can tell a title from the Poyser imprint by its air of quiet authority—well designed, but not flash; fact-filled, but not turgid; and excellent value for money. It was almost a shock to find that a book which exudes these admirable qualities was written in response to an EC command.

A series of Red Data books has been published since the mid 1960s, listing species of invertebrates, plants, birds and animals which are threatened with extinction on a global scale. Because of the wide scope of these books, produced to the specifications of the International Union for the Conservation of Nature and Natural Resources (IUCN), many countries have also compiled their own Red Data books. These give detailed information on vulnerable species and their needs on a national, rather than a planetary scale, and are a useful stimulus to local conservation effort.

The EC Directive on the Conservation of Wild Birds, adopted by the European Council of Ministers in April 1979, sets its sights on such local action by obliging member states to prepare and keep under review national lists of threatened bird species. A primary aim of the 'Birds Directive' is to maintain bird populations at least at their current numbers, distribution and breeding performance throughout the EC. So, in this European context, downturns in these parameters might indicate a species which is 'threatened' at a regional or national level.

Leo Batten and his team of co-authors, in a joint NCC/RSPB venture, have met one of our Birds Directive obligations by homing in on 117 species from the 520 or so on this century's British list to describe in detail as our Red Data birds. The geographical scope of the detailed texts for these rare, threatened or internationally important species, from Red-throated Diver *Gavia stellata* to Cirl Bunting *Emberiza cirlus*, is limited to Britain. Ireland and the Channel Islands are excluded because of differences in nature conservation laws and administration.

The bulk of the book comprises texts in a standard format which describe the status, ecology, distribution, population and conservation needs of each of these species. The accounts are succinct and up-to-date, with good cross-references to major papers on each species. Relevant references are listed at the end of each text, rather than in a mega-list at the end of the book—a simple but very practical touch.

Several short chapters and appendices follow the species texts. These considerably enhance the book's value as a reference work, for example by giving an illustrated summary of the major bird habitats in Britain and (in an excellent chapter by Stuart Housden on bird conservation) by explaining the salient points of national and international conservation laws, conventions and designations. If you have ever yearned for a neat summary of the Berne Convention, or wondered about the difference between a Ramsar site and an LNR, this book should be a boon.

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The authors say that they intend the book to be subject to future revision, expressing the hope that another edition in five or ten years' time will be 'better informed', partly on the basis of comments and factual information prompted by this edition.

That is a very modest statement for such a well-researched book. But it is also another challenge. I trust that many British ornithologists will rise to it by purchasing this book and using it as a working tool for bird conservation. KENNY TAYLOR

Phylogeny and Classification of Birds: a study in molecular evolution. By Charles G. Sibley & Jon E. Ahlquist. Yale University Press, Newhaven & London, 1990. 1,000 pages. £60.00.

Taxonomy is the practice of classification, and systematics is the study of the relationships among organisms. Since before Linnaeus, it has been appreciated that birds could be arranged into groups—wagtails, falcons, spoonbills, etc.—and Charles Darwin showed us how the similarities among the members of such a group indicate their common origin. It is now widely believed that an accurate understanding of the affinities of species could inform us, not only of their relationships, but also of their evolutionary history.

The majority of evolutionary biologists think that a species is a group of organisms that can actually or potentially interbreed, and that is reproductively isolated from other such groups. This means that there is no mixing of the groups, and genetical differences can arise between them. The traditional use of morphological traits in avian taxonomy has served us well for generations, but the use of anatomical similarities and differences does not easily lend itself to an objective assessment of taxonomic status (and has led to the old joke that a species is a species if a competent taxonomist says so). Nor does it allow the estimation of evolutionary time since the divergence of particular groups. Small wonder that avian (and other) systematists have turned to alternative, more quantitative, measures of affinity: numerical taxonomy, egg-white proteins, polymorphic enzyme systems, and so on.

When two groups of animals are reproductively isolated, however, differences in structure will arise and spread through them: they will diverge, and the longer they have been isolated the greater will be this divergence. At a genetic level, these differences are located in the DNA which exists as a series of very long, filamentous molecules, each of which comprises two closely adjacent parallel strands. Chemical bonds normally hold these strands together, but high temperature causes the bonds to break, the strands to separate, and the DNA to 'melt'. If the strands are very similar in composition, the bonds will be more frequent, and melting will not occur until a higher temperature than is necessary for less similar strands.

It is possible to juggle with the conditions in a test tube so that single strands are produced by dissociation of the DNA from two separate individuals. Relaxing the conditions allows the strands to reassociate and form a hybrid molecule. If the individuals are taxonomically diverse, the strands will be sufficiently different for alignment to be poor and the melting point to be lower than for organisms more closely related. Thus, by analysing the melting points of hybrid DNA from a wide diversity of species, it is possible to estimate their similarities based upon the structure and composition of their DNA.

This book reports upon a massive programme of research based upon this technology. It presents a truly awesome amount of data that is almost entirely the product of the two authors. It consists of two parts. The first gives a detailed but clear description of the molecular biology and historical background necessary to understand the second, leading up to a coarse-grained classification of modern birds into Orders, Families, Tribes, and so on. The second part deals with the analysis of most of these groups in detail, through 400 pages of text and over 350 graphs and dendrograms to show the relationships of the species involved. These, in turn, are used to produce a completely new order or list of the birds of the world based upon the gross genetic similarity of their DNAs. This classification is described in detail in the companion volume, but is very different from the Voous list to which we have all become accustomed. There are some startling relationships postulated. For example, gannets and cormorants go alongside penguins, flamingos and condors.

Is it right, and will it be accepted? One of the problems with any taxonomy stems from the perceived need to produce a list with a beginning and end, whereas the true relationships are much more akin to the twigs around the crown of a tree, with a series of branches merging

back towards a central trunk. This is an inevitable consequence of a two-dimensional page, and is a constraint rather than an error. Its general acceptance will depend more upon the speed with which succeeding studies confirm or refute its conclusions. For, already, a more sophisticated technology is on stream. Instead of analysing the behaviour of 'total' DNA, it is now possible to identify the chemical bases that comprise the linear strand of DNA itself. Thus, it is possible to select a fragment of DNA that is present in a wide range of species, and determine its base sequence in each species. A comparison of the proportion of bases that differ gives an alternative measure of genetic divergence. Furthermore, the careful comparison of the sequence in different species allows the potential for reconstructing the order in which the substitutions occurred, and hence the evolutionary history of the group. Finally, and most excitingly, there is evidence that in some regions of the DNA this rate of substitution is pretty uniform, so that differences can be related directly to evolutionary time. A comparison of the relationships postulated here by Sibley & Ahlquist with those produced from direct sequence analysis will be very interesting and informative, and the most contentious components will no doubt be analysed first.

This is a large, difficult, expensive and very important book. It will stir up debate concerning the taxonomic ordering of birds for years to come, and may also be of great significance to the editors of field-guides and handbooks for even longer.

DAVID T. PARKIN

Distribution and Taxonomy of Birds of the World. By Charles G. Sibley & Burt L. Monroe, Jr. Yale University Press, New Haven and London, 1990. 1,111 pages; 25 maps. £75.00.

This revolutionary world list uses the results of DNA-DNA hybridisation studies as its basis. This technique (described in Sibley & Ahlquist, 1990, *Phylogeny and Classification of Birds*) is a biochemical method that measures the degree of genetic similarity between different species. Readers who are familiar with 'conventional' taxonomic lists, such as Voous's (1977) *List of Recent Holarctic Bird Species*, will be thoroughly confused initially by the sequence and content of families: the work starts with the Ostrich *Struthio camelus*, as usual, but from then on there are few similarities with other lists. The Passeridae contains not only sparrows, but also wagtails, and the Corvidae embraces nearly 650 species, including such morphologically dissimilar groups as bushshrikes and fantails.

The book contains accounts for every species, with brief habitat details and fairly lengthy distribution information. The latter is supplemented by 25 pages of maps and a 32-page gazetteer, which includes all place-names mentioned in the species accounts.

The authors have adopted a very liberal approach to species limits, based on 'potential or actual reproductive isolation'. No explanation is given of the methods used to determine the applicability of these criteria in individual cases, but notes in the species accounts often provide references as a basis for their decisions. They recognise 9,672 species, compared with 9,022 in Morony *et al.* (1975), 8,721 in Gruson (1976), 9,147 in Walters (1980), 9,198 in Clements (1981), 9,311 in Edwards (1982-86) and 'over 9,200' in Howard & Moore (1991). The differences in numbers are due partly to the addition of newly described species, and partly to different views on the inclusion of extinct species, but mainly to different degrees of 'splitting' and 'lumping'. Sibley & Monroe include 77 'splits' which affect Voous's Holarctic list, 30 from the Nearctic and 47 from the Palearctic. The latter include 19 which occur in the Western Palearctic, of which six are on the British and Irish List. All of these, except Siberian Stonechat *Saxicola maura* (which according to Vaurie meets the Common Stonechat *S. torquata* without intergrading), have been agreed or discussed by the British Ornithologists' Union Records Committee. Some of the other Western Palearctic splits seem to be rather arbitrary (e.g. the Black-eared Kite *Milvus lineatus*, which is separated from the Black Kite *M. migrans* based on an undefined 'pers. comm.' suggestion). In one case, a split taxon deviates from widely accepted practice: the Tawny Eagle *Aquila rapax* is split into three species, African Tawny-Eagle *A. rapax*, Eurasian Tawny-Eagle *A. vindhiana* and Steppe Eagle *A. nipalensis*. The subspecies *orientalis*, usually associated with the Steppe Eagle, is here included with *vindhiana*, without any discussion. Most of the other relevant splits are discussed in *BWP*. Those which are not are Cape Verde Petrel *Pterodroma* (*mollis*) *feae* and Madeira Petrel *P.* (*m.*) *madeira* (see

Bull. Brit. Orn. Club 103: 52-58); Basra Reed Warbler *Acrocephalus* (*arundinaceus*) *griseldis* (see *Brit. Birds* 81: 171-178); Oriental Reed Warbler *A.* (*a.*) *orientalis* (see *J. Bombay Nat. Hist. Soc.* 48: 428-443); and Tenerife Goldcrest *Regulus* (*regulus*) *teneriffae*. Other potential Western Palearctic splits, such as Hume's Warbler *Phylloscopus* (*inornatus*) *humei*, recently discussed by Svensson (*Brit. Birds* 80: 580-581), are not even mentioned, despite the claim that 'unproven species' such as these are accorded intraspecific 'group' status.

Another innovative feature of this list is the attention given to the selection of English names for all species. A group of regional correspondents helped to choose the most appropriate names, generally adopting the name selected in the primary part of the bird's range, and avoiding disruption of established names wherever possible. Other world lists that have included English names have not had a systematic approach to the choice of names and are therefore potentially confusing for international use. Of the names used for Western Palearctic species, 304 differ from those used in the latest version of *The 'British Birds' List of Birds of the Western Palearctic* (1984). Of these, 122 would, however, be brought into line if the BOURC's suggested name changes (*Brit. Birds* 81: 355-377; *Ibis* 131: suppl.) were to be adopted. Some of the other names are not, in my view, very appropriate, but discussion is taking place on all English bird names over the next four years, under the auspices of the International Ornithological Congress, and Western Palearctic views will be better represented than they were in former discussions. The English names adopted for birds elsewhere in the world largely follow recent standard works for each region so far as endemic species are concerned. Compromise in the choice of names is evident for widely distributed species: Brent Goose rather than Brant for *Branta bernicla*, but loons rather than divers for *Gavia* species and jaegers rather than skuas for the smaller *Stercorarius* species.

Much potential confusion in the various world lists has arisen through usage of different taxonomy and nomenclature. One example serves to illustrate the problem. The species known currently as the Yellow-throated Sparrow *Petronia xanthocollis* in the Western Palearctic is of only marginal occurrence in the region. It extends to southwest Asia and, depending on taxonomy, to east Africa. It has no yellow on the throat, and Sibley & Monroe have adopted the name Chestnut-shouldered Petronia. They treat the east African population as a separate species, Yellow-spotted Petronia *P. pyrgita*, giving a reference for this decision. *P. pyrgita* is lumped by Morony *et at.* (1975), Walters (1980) and Howard & Moore (1991), but the last of these called the species Yellow-spotted Rock Sparrow *P. xanthosterna*. Gruson (1976) and Edwards (1982-86) both adopted the same taxonomy as Sibley & Monroe, but called *xanthocollis* the Yellow-throated Sparrow and Yellow-throated Rock-Sparrow respectively. Clements (1981) called *xanthocollis* the Chestnut-shouldered Sparrow, but apparently omitted *pyrgita* completely. Sibley & Monroe's work is the only one to define clearly and accurately the relationships between these two taxa.

This is not to say that the work is free from errors. Given the vast amount of information that is contained in the book, it is likely that it would be impossible to eliminate all errors. The accounts for Western Palearctic species that I have checked have been reasonably accurate and I would expect the New World species to be dealt with even more precisely. I did, however, uncover quite a number of errors in the accounts for less-well-known areas, such as Asia, particularly with regard to the distribution of Himalayan species. The worst mistakes for one species concern the entry '*Lophura haitensis* Vo Quy 1975. VIETNAMESE FIREBACK', which should read '*Lophura hatinhensis* Vo Quy and Do ngoc Quang 1965. VIETNAMESE PHEASANT'. The species should follow the closely related Edwards's Pheasant *L. edwardsi* in the list because it is not at all similar to the firebacks. It is, however, a welcome surprise to find this species in the list at all: every other world list, except Howard & Moore (1991), has overlooked it completely.

Despite the high cost of this book, I thoroughly recommend it as the most reliable one-volume work on the nomenclature and distribution of the world's birds. TIM INSKIPP

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