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Bulletin of the

British Ornithologists' Club

Edited by
Dr D. W. SNOW

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FORTHCOMING MEETINGS

Tuesday, 27 April 1993. Paul Salaman will speak on "Avifauna assisting Conservation: an example from the Colombian Choco". Paul Salaman is an environmental biology undergraduate of Anglia Polytechnic University and has led two Cambridge Student ornithological conservation expeditions to Colombia. These resulted in the implementation of new protected areas in Colombia, for which he received the first B.P. Conservation Award.

Those wishing to attend are asked to notify the Hon. Secretary by Tuesday, 13 April 1993.*

Tuesday, 18 May 1993, at 6 p.m. *Annual General Meeting*; after which Dr Adrian Lewis will speak on "A Bird Atlas of Kenya". Dr Lewis has widespread knowledge of the ornithology of eastern and western Europe and of the Middle East. Whilst a lecturer in geology at the University of Nairobi he began work, as senior author, on *A Bird Atlas for Kenya*. He remained in Kenya to complete this project. In addition, he has written many papers on Kenya's birds and mammals, and written, or contributed to, other books on Middle Eastern and Afrotropical birds.

Those wishing to attend are asked to notify the Hon. Secretary by Tuesday, 4 May 1993.*

Tuesday, 27 July 1993. Professor Charles Pilcher will speak on Kuwait. Professor Pilcher has been Professor of Pharmacology at the University of Kuwait for some years. He has detailed knowledge of the ornithology of the area, and directed the ICBP surveys on the environmental situation which were undertaken there after the Gulf War.

Those wishing to attend are asked to notify the Hon. Secretary by Tuesday, 13 July 1993.*

Tuesday, 21 September 1993. Dr Geoffrey Davison will speak on "Pheasants in Malaysian Rain Forest".

Tuesday, 19 October 1993. Dr Clive Mann will speak on "Bornean Birds".

Meetings are held in the Sherfield Building of Imperial College, South Kensington, London at 6.15 p.m. for 7 p.m. A map showing Imperial College will be sent to members on request.

*Late acceptances and cancellations can usually be taken up to the Thursday morning preceding a meeting, although members are asked to accept by 14 days beforehand as arrangements for meetings have to be confirmed with Imperial College well in advance.

If you accept and subsequently find you are unable to attend please notify the Hon. Secretary, 1 Uppingham Road, Oakham, Rutland LE15 6JB. (tel. 0572 722788) as soon as possible as the booking can often be offered to another member.

Bulletin of the BRITISH ORNITHOLOGISTS' CLUB

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REPORT OF THE COMMITTEE FOR THE CLUB'S CENTENARY YEAR 1992

Meetings. Nine evening meetings with a buffet supper were held during the year at Imperial College and, in celebration of the Centenary of the Club in 1992, a dinner was held at Stationers' Hall in the City of London on 16 November.

A total of 463 members and guests attended these functions, which is the highest number in recent years except for 1990, when 13 meetings were held which included the 800th meeting of the Club and the Conversazione at the XXth I.O.C.

At the evening meetings the programme in 1992 presented a wide diversity of ornithological subjects; the Club was particularly fortunate that Dr M. Louette, Professor Storrs Olson, Drs Walter and Ulrike Thiede and Dr Carlo Violani were able to spare time to speak to the Club durings visits they made to London.

An account of the Centenary Dinner is published elsewhere in the *Bulletin*.

Committee. The Committee met 8 times during the year and the average attendance of the 9 members was 77%.

The sale of the property at Tring, bequeathed to the Club by the late Herbert Stevens, was completed in July. The Supplemental to the Trust Deed setting up the Herbert Stevens Fund with the proceeds of the sale was presented and approved at the Annual General Meeting. It has been placed on the Central Register file of the Charity Commission.

Two of the Trustees, in whom the property had been vested, Mr David Calder and Mr John Parker, signified their wish to stand down at the Annual General Meeting. The Club is indebted to Mr Calder and Mr Parker for this service to the Club over many years.

Mr Peter Oliver continues to serve as Trustee and his appointment, together with that of Mr Richard Price and Mr Nigel Crocker, as New Trustees to the Herbert Stevens Fund was approved at the same meeting.

The Committee reported last year that it hoped to use the augmented funds available to the Club from income generated by the Fund to finance additional projects which are in accordance with the objects of the Club. The Committee is presently considering the publication of monographs particularly concerned with taxonomy and systematics which institutions in this country have seemingly neither the funds nor the inclination to publish.

The precedent for additional publications was set in 1992, to mark the Centenary of the Club. A special issue of the *Bulletin* (*Bull. Brit. Orn. Cl.* 112A) was published in November entitled *Avian Systematics and*

Taxonomy, edited by Dr James Monk, who solicited papers from some 20 internationally renowned authors. The volume, in hardback and of over 300 pages, is likely to be a required reference for some years to come. Dr Monk is to be congratulated for this prestigious production.

The Club also marked the Centenary with a joint project with Helm Information. Dr David Snow, to whom the Club is much indebted, was commissioned to edit and annotate an anthology of papers which had appeared in the *Bulletin* over the past 100 years. *Birds, Discovery and Conservation* was launched in September at the B.O.U.'s meeting at Liverpool. The book has been very warmly received.

The Club gratefully acknowledges grants of £500 and of £250 from the J. Rothschild Group Charitable Trust and another charitable trust respectively towards the costs of its production.

Deaths. It is with deep regret that the Committee reports the deaths of Mr R. A. Hughes (*Member 1987–1991*), Mr R. M. O'Rourke (*Member 1987–1992*) and The Reverend Dr William Serle O.B.E. (*Member 1945–1992*). Dr Serle was probably the last member to describe and exhibit a new form at a Club meeting—he had collected a new species of shrike *Chlorophoneus (Malaconotus) kupeensis* and a new subspecies of Apalis *Apalis rufogularis sanderi* during a tour of duty in West Africa (*Bull. Brit. Orn. Cl.* 71 (1951):41–43). An obituary will appear in *Ibis*.

Membership. The paid-up membership at 31 December 1992 was 594, 363 members with U.K. addresses and 231 with addresses overseas. Although there were 24 new members in 1992 and 6 members who were in arrears became fully paid-up, 26 members resigned and 31 failed to pay their subscriptions. This resulted in a drop in the total membership from the 623 of 1991. This reduction perhaps partly reflects the increase in the subscription, which had to be introduced in 1992, and a review by many members of their subscription lists, which has been reported generally by societies.

Bulletin Sales. Non-member subscribers were 147, 24 in the U.K. and 123 overseas. Although 7 institutions did not renew their subscriptions it is noted that there were 6 new individual non-member subscribers in 1992.

The Club is very grateful to Mrs F.E. Warr for looking after the stock of back-numbers of the *Bulletin*, and dealing with their despatch and that of separates to authors.

Bulletin. Volume 112 consisted of 280 pages, a further increase in size from the previous volume, and contained 43 papers and 7 shorter (In Brief) contributions. Papers included descriptions of 2 new species (including a new Palaearctic finch) and 7 new subspecies (including a new Palaearctic race of Sand Martin). New distributional data were published for Cameroun, Cape Verde Islands, and 3 Central American and 3 South American countries. Among a variety of papers of ecological or behavioural interest may be mentioned a study of vocal behaviour of one of Africa's least known owls, *Jubula lettii*, the first detailed account of the natural history of the world's smallest flightless bird, *Atlantisia rogersi* of Inaccessible Island, and a recent detailed study of the *Neospiza* buntings also of Inaccessible Island. There was the usual variety of papers dealing with points of distribution, taxonomy and nomenclature. The geographical distribution of authors was perhaps the widest so far, with contributors from 24 countries in 5 continents.

Finance. The recently introduced credit card facility for the payment of subscriptions and purchases proved to be popular with members and is being increasingly used.

Sales of the two Centenary publications and of the Club ties were at a satisfactory rate in 1992 and helped to offset a part of the cost of their production.

Investment income fell, particularly in the last quarter of 1992, because of the considerable reduction in available interest rates.

The Accounts for 1992, which are not yet available, will be tabled at the Annual General Meeting and published subsequently in the *Bulletin*. Members wishing to have copies before the Annual General Meeting are asked to apply to the Honorary Treasurer.

ANNUAL GENERAL MEETING

The Annual General Meeting of the British Ornithologists' Club will be held in the Ante-room, Sherfield Building, Imperial College, London SW7 at 6 p.m. on Tuesday, 18 May 1993.

AGENDA

1. Minutes of the 1992 Annual General Meeting (see *Bull. Brit. Orn. Cl.* 112: 137–138).
2. Report of the Committee and Accounts for 1992.
3. The *Bulletin*.
4. The election of Officers. The Committee proposes that:-
   (i) Mr D. Griffin M. A. be elected Chairman *vice* Mr R.E.F. Peal, who retires on completion of his term of office.
   (ii) The Reverend T. W. Gladwin be elected Vice-Chairman *vice* Mr D. Griffin, who retires on completion of his term of office.
   (iii) Mr S. J. Farnsworth be re-elected Honorary Treasurer.
   (iv) Mrs A. M. Moore be re-elected Honorary Secretary.
   (v) Mr R. E. F. Peal be elected member of the Committee in the event of the Reverend T. W. Gladwin being elected Vice-Chairman.
5. Any other business of which notice shall have been given in accordance with Rule (12).

By Order of the Committee
AMBERLEY M. MOORE, *Honorary Secretary*

The eight hundred and twenty-third meeting, a dinner to celebrate the Centenary of the Club, was held at the Stationers' Hall in the City of London on Monday, 19 November 1992. 43 members and 33 guests attended.

Members attending were: Mr R. E. F. Peal (*Chairman*), M. A. Adcock, Miss H. Baker, K. Betton, Mrs D. Bradley, N. J. Bucknell, P. J. Bull, Cdr M. B. Casement, RN Retd, Dr R. A. Cheke, G. S. Cowles, Dr R. A. F. Cox, A. Gibbs, Dr A. Gosler, Rev. T. W. Gladwin, D. Griffin, Mrs B. P. Hall, C. A. R. Helm, K. W. Henshall, P. Hogg, S. Howe, Y. Lemauviel, Dr J. F. Monk, D. Montier, Mrs A. M. Moore, Mrs M. N. Muller, P. J. Oliver, J. G. Parker, R. C. Price, R. S. Pritchett, A. J. Randall, P. S.

Redman, R. E. Scott, P. Sellar, Dr N. Skinner, Dr D. W. Snow, N. H. F. Stone, Dr C. G. Violani, M. Walters, Mrs F. E. Warr, Professor W. E. Walters, C. E. Wheeler, M. W. Woodcock.

Guests of the Club: Dr C. Edelstam, Dir. K. Engström, Professor Sir Brian Follett, F. R. S., Lady Follett, Dr J. J. D. Greenwood (*member*), Professor Janet Kear, Miss Barbara Young.

Guests: Mrs B. Adcock, Ms E. Berry, I. Bishop, Mrs G. Bonham, M. Bradley, Mrs M. Bull, Dr J. A. Coles, Ms C. M. Jackson-Houlston, Mrs J. M. Gladwin, Mrs S. Griffin, Mrs B. Hammond Gibbs, Mrs A. Helm, Mrs M. Henshall, Mrs D. Monk, Mrs M. Montier, P. J. Moore, C. A. Muller, Mrs M. Oliver, Mrs E. Peal, Mrs H. Price, Mrs K. Randall, Mrs A. Scott, Mrs B. Snow, J. Warr, Mrs S. Wells, Mrs D. Wheeler, Mrs B. Woodcock.

Members and guests were received by the Chairman and Mrs Peal in the Stock Room, and the reception was followed by dinner in the Livery Hall of the Worshipful Company of Stationers and Newspaper Makers.

After the Loyal Toast, proposed by the Chairman, the Hon. Secretary read the congratulatory messages that had been received from ornithologists at home and abroad, with the apologies from those who had hoped to be present but were unable to be. These were received from: Dr Dean Amadon (American Museum of Natural History), who particularly regretted being unable to be present, due to recent illness, as he had attended the B.O.U.'s centenary celebration in 1959; Professor Walter Bock (Columbia University, New York); the Editorial Board of *British Birds*; D. R. Calder; J. H. Elgood; Dr C. Erard (Muséum d'Histoire Naturelle, Paris); B. H. Harley, who most regrettably was stuck in a train somewhere in Essex; Dr John Kricher (President, Nuttall Ornithological Club, the B.O.C.'s senior by 19 years); De Gérard Morel (France); Dr Kenneth Parkes (Carnegie Museum, Pittsburgh); Dr C. M. Perrins; Dr Theresa Searight (better known to ornithologists as Theresa Clay); K. V. Thompson; Dr Karel Voous (Netherlands). Dr Erard included in his message his gratifying opinion that "the *Bulletin* is still the leading publication in this field [avian taxonomy]; I would say that it is the Official Journal of ornithological nomenclature and taxonomy. This is a very important role nowadays when molecules are too often preferred to organisms."

Speeches and further toasts followed. Dr James Monk began by introducing and welcoming the Club's guests. He conveyed the Club's best wishes to the three other national ornithological organizations, the British Ornithologists' Union represented by Professor Janet Kear, the Royal Society for the Protection of Birds represented by Barbara Young, and the British Trust for Ornithology represented by Dr Jeremy Greenwood. Members and guests were then treated to speeches, sometimes instructive and always entertaining, by (in order of delivery) Professor Sir Brian Follett (Biological Secretary and Vice-President, Royal Society), Professor Janet Kear (President, B.O.U.), Dr Carlo Violani (Italy; speaking for overseas members), Ronald Peal (Chairman) and Dr Jeremy Greenwood (Director, British Trust for Ornithology). Space is insufficient to allow full transcripts of the speeches, and selection difficult. Because it throws an interesting sidelight on the Club's history, and contains a worthy tribute to a former editor of the *Bulletin*, most space is given to extracts from Dr Violani's speech.

Sir Brian Follett recalled that his university, Bristol, subscribed to the *Bulletin* from its first issue. The 1890s were in many ways "the heroic age of zoology", but it had to be admitted that interest in animal behaviour was limited, and binoculars were hardly ever used; "they had another weapon with which they enjoyed ornithology they shot the beasts!" Nevertheless, in ornithology as in literature and the arts, there were giants in those days, the like of whom we do not see today.

Janet Kear recalled gentler aspects of ornithology, which began to appear 100 years ago. The winter of 1892/3 was extremely cold. Gulls were being shot from the London bridges, as they had long been; but in this winter the practice was stopped by London magistrates, and for the first time the regular feeding of gulls began, as hundreds of working men and boys went down to the river during the midday break and gave them scraps from their lunch. And the centenary dinner itself was another aspect of the civilised side of ornithology; "it is the pleasure of 100 years of talking, thinking, listening and exchanging ideas about birds that we are celebrating tonight."

Carlo Violani recalled that a compatriot, Count Tommaso Salvadori, was a founder member of the Club, and was a regular attender of its meetings when he was working on his volumes of the great *Catalogue of Birds of the British Museum*.

"Only when he was too old to travel from Turin to London, he sent his papers directly to Sharpe to be read at the Club meetings on his behalf. One of his last letters to Sharpe (now preserved in the Blacker-Wood Library of McGill University, Montreal) is particularly worth quoting tonight, as it gives us the flavour of his time:

Turin, 10th March 1904

My dear Sharpe,

I was very pleased to hear that you were safely back from your expedition to the West Indies. My pleasure was increased by at last receiving a letter from you, an event which seldom happens to me. I had perceived from your remarks on *Lampribis* (not *Hagedashia*!) *olivacea* that you were a little bit touched by my criticism! My dear old friend, we both work for the sake of truth, and as we have both done some work in Ornithology, I think that we can both sustain a decent criticism, when we make a mistake, which is quite *human*.

What I think of yourself you must know, both as an ornithologist and a dear friend. In both respects you are at the top of my list. I suppose you will have something to tell about your recent trip. I must say that I am rather disgusted with the recent work of many ornithologists. When the trinomial system has the consequence of adopting such names as *Coccothraustes coccothraustes coccothraustes*, *Oriolus oriolus oriolus*, *Pica pica pica*, I conclude that the system is absurd! No less absurd is Hartert's system of using the names *Carpodacus* (mas.) *rhodochroa* (fem.), *C. rhodopepla*, *C. rosea*, *C. erythrina*, *C. synoica*. Sensible people will laugh at us if we continue in this way. What to say of Kleinschmidt? Have you seen his recent paper in the J. f. Orn.? Do you know what are *Turdus vernus*, *Turdus collaris*, *Turdus arboreus*. *T. socius*, *T. borealis*? I do not understand why Reichenow accepts such insanities!

I do very little ornithological work at present. No fresh collections are coming in. After the death of Fea, we have no other good collector.

I should like very much to have the opportunity of visiting again old England and the many friends who remember me! I much doubt that there is much chance for this. There are too many persons who expect help from me, and four children among them. Can I go about spending the money which is necessary for them? Let us do our duty first of all.

My daughter as you know is back with me, together with her child. Believe me always,

Your old friend

T. Salvadori.

"Less than a fortnight ago, I was staying in a medieval town in Central Italy, working in a small museum which, eventually, will take Salvadori's name. A precious collection of some 600 bird specimens secured by Savadori himself in his native region—the Marche—and donated to that town by his descendants needs re-cataloguing and restoration. Many of the original labels were destroyed long ago, but through Salvadori's letters and early writings it is possible to reconstruct the origin and the historical details of several of these birds. Some of the rarer specimens, however, including falcons, a male White-headed Duck and an extinct francolin, were thought to have been dispersed, but last week they have been retraced under false data and locality in a local private collection. It is mostly because someone could re-identify Salvadori's handwriting on their tiny labels, that these specimens can be claimed back as stolen property, and the unscrupulous owner will be finally brought to justice!"

"Unfortunately very few people in Italy care now for the rich historical material housed in scientific museums, or for bird taxonomy and systematics. Birdwatching and mathematical models or formulas are still highly fashionable in ornithology, in my country as abroad. So, when some years ago our unforgettable friend Con Benson suggested that I should re-examine the historically important bird collections in Italian museums, I hardly imagined that a new field of research was about to be opened in front of me.

It was Con Benson who showed me first Salvadori's handwriting on the labels of some African parrots in Cambridge Museum; it was Con Benson who guided me in the search of type specimens, long forgotten in dusty drawers; it was Con Benson who introduced me to the scientific world of the *Bulletin* and to the lively community of the Club members and their close friends. He always devoted a great lot of his time to helping and corresponding with young ornithologists, especially those from foreign countries. What a marvellous man Con Benson was!"

The Chairman began his speech by expressing his appreciation of the tie which has always linked Club membership with Union membership. He then drew attention to the Club's international strength, which contrasts too strongly with its limited strength in this country. "The Club is based in this country, but over 35% of our members are in other countries and 85% of non-members subscriptions to the *Bulletin* come from abroad. There are just two

The Centenary Dinner. Upper: Dr James Monk introduces the Club's guests. Lower: Sir Brian Follett recalls the 1890s.

Photographs: Y. Lemauviel

British universities which subscribe to the *Bulletin*—I hasten to add that Bristol is one of them—against, for example, 30 or more universities in the U.S.A. So perhaps we should not be surprised to find how little importance is attached to avian taxonomy in Britain. . .

"The Club, like any organism in an ever-changing environment, has had to adapt or sink. A century ago, very soon after its foundation, it is recorded that it contained nearly all the working members of the Union resident in this country. They were overwhelmingly gentlemen of financial substance plus a very few museum staff. Almost all would have had their own collections of bird skins and of eggs to which they added by purchase as well as by their own collecting in the field. An outstanding example of an old style meeting was the 100th meeting of the Club held in 1903 when, after the Chairman's Annual Address, over 30 skins were exhibited and there were described as new to science 3 new genera, 17 species and 11 subspecies. . .

"Whereas the content of meetings has changed gradually over the years, in 1952 there was a sudden transition in the *Bulletin* from being a report of proceedings of a meeting and short contributions from absent members to being a conventional scientific journal. We have been fortunate in securing a succession of eminent editors—in particular two who are here tonight, Dr James Monk, Editor for a record period of just over 15 years, and Dr David Snow, our present Editor—both of them former Editors of *Ibis* and both of them President of the Union for part of the time they have edited the *Bulletin*. As Dr Snow has pointed out elsewhere, the *Bulletin* has throughout its 112 volumes been maintained in its small format, appreciated equally by those who read it in a train and by librarians. I should like to take this opportunity to thank another who is here, our Honorary Secretary, who works so hard and cheerfully for the Club. . .

"At about the same time as the style of the *Bulletin* was changed, some 40 years ago, it was decided for financial reasons to seek charitable status for the Club and to achieve that it became necessary to cement the Club to its purposes of scientific ornithological discussion and the promotion of publication of scientific ornithological information.

"We have resisted the urge common to centenarian bodies to publish a lengthy history of the Club. We have chosen instead to commemorate the *Bulletin* by the anthology produced by Dr Snow—*Birds, discovery and conservation*—and to have a special volume of the *Bulletin*, edited by Dr Monk, of invited papers by leading biologists, on Avian Systematics and Taxonomy, copies of which have just arrived from the printers.

"As regards the future, we are hoping to publish a monograph cataloguing the skins of extinct and seriously endangered bird species in the collections of the Natural History Museum, a work of specialized interest but of particular value to those concerned in conservation of endangered species and in biodiversity generally. We hope that it may not be too long before we are in a position to publish it. There is also the possibility of publishing other monographs on taxonomic or allied subjects, which are too long for acceptance for journals.

"The Club is in good shape at the end of its first 100 years. I hope and pray that it may long continue to flourish, increasing the knowledge of birds, to the advantage both of man and of birds."

Jeremy Greenwood, after referring to the early members of the Club taking "a rather more robust attitude to birds than we do today", with the example of the fate meted out to an abnormally coloured Blue Tit (exhibited as a skin at the 100th meeting), pointed out that in the same year Club members established the Kite Committee, which marked the beginning of effective protection of the Red Kite in Britain, and the following year saw the setting up of the Committee on Migration, which organized one of the first pieces of cooperative research in ornithology. He ended by proposing the final toast, to the Club's founders, a remarkably diverse group of people but all sharing, in greater or lesser degree, the "immense and almost boyish enthusiasm" which was Bowdler Sharpe's outstanding quality, an enthusiasm which has continued and has been ultimately responsible for the Centenary Dinner.

The eight hundred and twenty-fourth meeting of the Club was held on Tuesday, 1 December 1992 in the Ante-room, Sherfield Building, Imperial College, South Kensington at 6.15 p.m. 27 members and 15 guests attended.

Members attending were: R. E. F. PEAL (*Chairman*), R. E. SCOTT (*speaker*), M. A. ADCOCK, Miss H. BAKER, K. F. BETTON, Dr M. CARSWELL, Cdr M. B. CASEMENT, RN Retd, Dr R. A. CHEKE, I. D. COLLINS, P. J. CONDER, Dr R. A. F. COX, J. H. ELGOOD, G. D. FIELD, A. GIBBS, Rev. T. W. GLADWIN, D. GRIFFIN, C. A. R. HELM, Dr A. MELDRUM, Dr J. F. Monk, D. Montier, Mrs A. M. Moore, M. L. R. Romer, Dr R. Self, P. J. Sellar, N. H. F. Stone, A. R. H. Swash, C. E. Wheeler.

Guests attending were: Mrs B. Adcock, R. L. Berry, Major D. Counsell, Mr J. B. Fisher, Mrs L. Fisher, Mrs J. Gladwin, Ms C. Hoff, Mrs H. Meldrum, Miss M. Mileva, Mrs M. Montier, P. J. Moore, R.Newton, N. Peace, T. Parmentier, Mrs A. Scott.

After supper it was pleasing to be able to welcome Mr Scott again to speak to the Club. He has sent the following account of his address.

In February and March 1992, Ann and Bob Scott visited Rwanda and Burundi in Central Africa with the objective of running training courses for the field staff at the national parks. Government agencies, INECN (Burundi) and ORTPN (Rwanda) were very supportive of the project and the RSPB provided sabbatical leave and much of the training equipment.

In Burundi the base for the course was the Rusizi National Park at the mouth of the Rusizi river on the northern shore of Lake Tanganyika. Elements of the course included: birds and their adaptation to the environment; use of field guides and optical equipment; migration; field identification; and record keeping. The second course was held in Rwanda at the Akagera National Park on the border with Tanzania. This course followed a similar structure but with more emphasis on showing birds to people.

Both countries face several environmental problems that are common to much of Africa. These include a rapidly expanding human population, land use pressures, loss of protected land, and poaching. The key protected sites provided some spectacular bird watching, including numerous Palaearctic migrants as well as some of the local endemic species. In addition to the two National Parks, visits were made to Lac Rwihinda reserve in Burundi, and in Rwanda to Nyungwe Forest reserve and Volcans National Park.

The eight hundred and twenty-fifth meeting of the Club was held on Tuesday, 19 January 1993 in the Ante-room, Sherfield Building, Imperial College at 6.15 p.m. 21 members and 9 guests attended.

Members attending were: R. E. F. Peal (*Chairman*), Dr A. G. Gosler (*speaker*), M. A. Adcock, P. J. Belman, Mrs D. M. Bradley, D. R. Calder, Cdr M. B. Casement, RN Retd, Professor R. Chandler, Dr R. A. Cheke, P. J. Conder, S. J. Farnsworth, Rev. T. W. Gladwin, D. Griffin, R. H. Kettle, Dr C. Mann, Dr J. F. Monk, Mr D. Montier, Mrs A. M. Moore, R. G. Morgan, Dr R. Self, N. H. F. Stone,

Guests attending were: Mrs B. Adcock, D. Brooks, Mrs W. Brooks, Mrs F. Farnsworth, Miss H. Fuller, Mrs J. M. Gladwin, Ms K. Hoff, Mrs M. Montier, P. J. Moore.

After supper Dr A. G. Gosler spoke on his work on the long-term study of the Great Tit near Oxford. His talk was received with great interest and prompted many questions. A summary of his talk is given below.

Bill adaptations in the Great Tit—or 'A mandible for all seasons'. The enormous diversity of bill adaptations shown by different bird taxa leads one to consider whether variation in bill size and shape within species is also adaptive. This question was addressed by a detailed study over more than ten years of bill variation in the Great Tit population of Wytham Woods, Oxfordshire. The bills of birds within this population varied more than any other morphological character. Bill size differed between sexes but not as predicted by differences in body size alone. In observations of captive birds in the laboratory, bill size was correlated with feeding efficiency for different foods. Bill size and shape in the wild birds varied seasonally and closely tracked changes in the birds' food supply from winter seed to summer insects. Bill length was related to prey size during the breeding season. In winter, sex differences in the bill corresponded to sex differences in foraging. These reflected differences in access to resources that arose from the hierarchy of social dominance. Social dominance also explained differences in the relative variation in bill size in different age and sex classes. Finally, bill size correlated with a measure of body condition, indicating that it could have a direct influence on fitness.

817th meeting of the Club

The following is a summary of Dr Carlo Violani's talk on Giovanni Antonio Scopoli and his influence on Italian ornithology.

Giovanni Antonio Scopoli (Cavalese, Trent, 1723—Pavia, 1788) was one of the most typical of the versatile scientists of the European Enlightenment. His main fields of interest and works ranged from dietetics to zoology, from botany to mineralogy. He started his career as a physician in several localities of the Austrian Empire (Trent, Graz, Vienna, and Carniola in Slovenia) and was subsequently appointed as professor of Botany and Chemistry first at Schemnitz (now Czechoslovakia) and finally at the University of Pavia. His ornithological writings are included in the *Anni Historico-naturales* (1769–1772), *Introductio ad historiam naturalem* (1777) and in *Deliciae Florae et Faunae Insubricae* (1786–88), where he described several new species and genera of birds (such as *Sylvia, Apus, Branta*) in accordance with Linnaeus' system.

An early appreciation of Scopoli's ornithology is documented by a famous letter by Gilbert White: "Scopoli's characters of his ordines and genera are clear, just and expressive, and much in the spirit of Linnaeus. There is room to expect great things from the hands of that man, who is a good naturalist; and one would think that a history of the birds of such a distant and southern region as Carniola would be new and interesting. Every kingdom, every province should have its own monographer. . .". The influence that Scopoli had on Italian ornithology was to be noticed in the long run, as it inspired directly or indirectly a series of regional works on birds from several districts, such as—among others—Bonelli's Catalogue of the birds of Piedmont, and Savi's Tuscan Ornithology. Scopoli's adherence to the Linnaean rules (but not as blindly as Stresemann hastily remarked) helped to consolidate the use of the binomial system in the ornithological literature of our country.

Birds of a northern Venezuelan secondary-scrub habitat

by Betsy Trent Thomas

Received 21 February 1992

Secondary-scrub habitat is distributed widely in the neotropics, and increasing especially in areas adjacent to growing urban populations. Although this habitat generally ranges from Mexico to Argentina, few long-term observations have been published about the birds of this community. In addition to the obvious application to conservation, of a species list at a site likely to undergo further alteration and degradation, there are other uses for such a list. Monthly presence, abundance, breeding, and moult records for over 19 years indicate which species are resident and which are long-distance migrants, both North American and austral. Less clear are Venezuelan species that use secondary-scrub habitat seasonally and are probably local wanderers, or are genuinely uncommon birds.

The Appendix is a compilation of data collected mostly from April 1966 through June 1984. It gives 191 species, of which *c.* 36% ($n=69$) are residents of the study site or nearby areas, *c.* 7% ($n=13$) are North American migrants, and *c.* 3% ($n=6$) are believed to be austral migrants. Austral is used in the sense of south of Venezuela, not necessarily south of the equator.

Study site and methods

The 147 ha site of this study was Urbanización Los Anaucos which is 30 km south of Caracas, Venezuela, in the state of Miranda at 10°19′N, 66°51′W. This area consists of steep (up to 45% grades) south-facing foothills of the Coastal Cordillera that surrounds Caracas. The original forest was cleared over 400 years ago, resulting in the impoverished and degraded low deciduous forest of the present. In the early years of this century the land was part of a large hacienda, and in the 1930s much of it was cleared for coffee growing with *Erythrina poeppigiana* trees planted to shade the coffee. Coffee growing here was not a success, probably because of insufficient rainfall, and much of the land was allowed to regenerate. By the mid-1950s most of the study area had been converted to a residential neighbourhood built on the steep hills surrounding a golf club in the valley. The houses, and their access of paved streets, were widely separated. In 1964 a 4-lane limited-access highway cut off the higher-elevation part of Los Anaucos. This 6-ha forested section at 825–1010 m had a few lingering coffee shrubs, a closed canopy *c.* 20 m high of indigenous trees, and occasional large bamboo clumps. It was not subjected to wildfires.

Most bird observations were made in the lower (550–800 m) area of 141 ha. A seldom-used golf course and soccer field (*c.* 48 ha) were in the valley. The area surrounding the valley was intersected by many dry watercourses and gullies that carried surface water only during heavy rains. The deciduous vegetation was generally less than 10 m high consisting of native trees and abundant vines with an open understory, and some large bamboo clumps. In the valley, partly bordered by the golf course, was the Quebrada Caiza, a small permanent watercourse that supported a richer and higher native vegetation (trees to 25 m) along its edge. Extensive secondary grass-covered hillsides surrounded much of the study area. During the dry season frequent wildfires swept drier areas, destroying all surface vegetation. In April 1977 such an area was burnt, and from 1981 to 1984 I studied more intensively the birds of a 13 ha section of the regenerating habitat where the dominant vegetative species was mesquite *Prosopis juliflora*. Opportunistic mist-netting (543 net hr), mostly to colour-band birds, was done mainly in this 13-ha site from 1976 to 1984. Weights of those birds were reported (Thomas 1982, 1990), and additional detailed data for two species are in Thomas (1977, 1983).

Ewel & Madriz (1968) list the area as *bosque seco premontano transición*, giving 865 mm average annual rainfall. Rainfall collected in the valley from June 1982 through May 1984 averaged 678 mm for the two years. Those may have been drier years than usual or, more likely, because the Los Anaucos site is in a rain shadow of adjacent higher mountains to the north. The usual seasonal rainfall pattern was of little precipitation December through March, the dry season, to heavier rains June to September, the wet season. The months of April–May and October–November were variable throughout the years of study. Rains sometimes began in April, and in other years rain continued into November. This same irregular rainy season was found in the llanos of Venezuela (Thomas 1985). The annual temperature of the valley varied from 14° to 39°C.

During the years of this study I lived at two different locations in the study area and made 348 census counts, generally in the morning averaging 3 h each. These data were supplemented with opportunistic observations throughout the day and vocalization records in the night. In addition I visited the study area for five days in February 1987 and three days in May 1988. Due to the steep nature of the terrain it was never possible to survey all the study area in a single day, but an effort was made to visit most different micro-habitats throughout the year.

Nomenclature and sequence generally follow the AOU Checklist (1983), with Tyrannidae following Traylor (1977) and Thraupidae following Isler & Isler (1987).

Discussion and results

The breeding season of most neotropical birds appears to be rainfall dependent (Friedmann & Smith 1950, 1955, Snow & Snow 1964, Haverschmidt 1968, ffrench 1973, Thomas 1979). Friedmann & Smith (1950, 1955) published a detailed account of eight years of observations and collecting in the Venezuelan states of Anzoategui and Monagas, an area approximately 300 km southeast of the Los Anaucos site. However, their area differed from Los Anaucos because the vegetation was not second growth, and the altitude was lower with higher rainfall. Approximately 65% of the species in the Appendix are found also on their list.

Agreeing with Haverschmidt (1975), I did not find *Colombina passerina* and *C. minuta* in the same micro-habitats. *C. passerina* was found only in the 13-ha valley wildfire area at 550 m, while *C. minuta* was found at about 700 m where vegetation was less subject to wildfires. *Columbina talpacoti* was sympatric with both smaller doves.

The breeding data in the Appendix agree generally with other long-term Venezuelan observations (Friedmann & Smith 1950, 1955, Thomas 1979), with the exception of that for *Ortalis ruficauda*. Friedmann & Smith list April–June as breeding months. Schäfer (1953–1954) said that it breeds at the same time as in the llanos, May to the end of July. Lapham (1970) found breeding in the llanos May–June. However, for the ranch Masaguaral, Estado Guárico, close to Lapham's study site, I have a record of a nest with a fresh egg on 16 March 1981 (unpublished).

My Los Anaucos records for *Ortalis* are all based on observations of young chicks. On 17 January 1977 I encountered three adults, in thick high vegetation, leading two stripe-headed downy chicks, of *c.* 10 cm, that were unable to fly. On 24 March 1974 I found a downy young bird of *c.* 12 cm that could run well on the ground but not fly. Its parents were carrying banana from my nearby bird feeder to it. By 31 March this same chick was still covered with rufous body down with strong, dark crown and nape stripes, but it could fly about 1 m distance, and was brought by its parents to the bird feeder, where it was fed bananas. On 29 October 1971, near dusk, I found two adults at about 3 m high in a thorny tree guarding a very young chick. This chick was downy as described above, it could not fly and it balanced unsteadily in the tree branches.

The hummingbird breeding season is in the dry season at Los Anaucos, just as Snow & Snow (1964) found in Trinidad, with one exception. *Phaethornis augusti* bred in the wet season. Two reasons may account for this difference. It may need rain to make mud available with which its pendent nest is balanced (Gilliard 1959), and I believe it is more insectivorous than other hummingbird species.

I give breeding data for 90 spp., but Snow & Snow (1964) suggested that the timing of moult might be an even more precise way of determining breeding. Therefore, I have included moult data in the Appendix, for 33 species that I found in remigial or rectricial moult from mistnetting. This extends the data for seven species for which I lacked more direct breeding observations.

In the Appendix, an 'x' indicates that the bird was observed during the month; a 'B' indicates breeding as determined by nest building, copulation, a nest with eggs or young, or counted back from observations of adults feeding recently fledged young; a '.' indicates the species was not observed in that month in any of the 19 years. A bracket indicates primary or rectricial moult in the months bracketed. Abundant means that the species can always be found on the study site, common that it is likely to be encountered on 75% or more of censuses, fairly common on 50% of the censuses, uncommon on 25%, and occasional on less than 25% of field censuses. Rare indicates that I found the species less than five times. A few birds were found only in the higher-elevation forest and they are marked 'forest'.

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APPENDIX

Birds recorded at Los Anaucos, Estado Miranda, Venezuela

Family and species	J	F	M	A	M	J	J	A	S	O	N	D	Abundance
PODICIPEDIDAE (1)													
Podiceps dominicus	.	x	.	.	.	.	.	.	.	x	.	.	Rare; seasonal pond 1981
CATHARTIDAE (2)													
Cathartes aura	x	x	x	x	x	x	x	x	x	x	x	x	Common resident
Coragyps atratus	x	x	x	x	x	x	x	x	x	x	x	x	Common resident
ACCIPITRIDAE (9)													
Gampsonyx swainsonii	x	.	.	.	.	.	.	.	B	B	x	x	Uncommon
Elanoides forficatus	.	.	.	.	.	.	.	.	x	.	.	.	Rare vagrant
Leptodon cayanensis	.	.	.	.	.	.	x	.	.	.	.	.	Rare
Chondrohierax uncinatus	.	.	.	x	.	B	B	x	x	x	.	x	Rare; Dec 1980 and pair in 1981
Buteo albicaudatus	x	B	x	x	.	.	x	x	x	x	x	.	Uncommon
Buteo platypterus	x	x	x	.	.	.	.	.	.	x	.	x	Rare N. Am. migrant
Buteo magnirostris	x	x	x	x	x	x	x	x	x	x	x	x	Common resident
Buteo nitidus	x	x	x	x	x	x	x	x	x	x	x	x	Uncommon resident
Spizaetus tyrannus	.	.	x	.	.	.	.	.	.	.	x	x	Rare vagrant
FALCONIDAE (5)													
Herpetotheres cachinnans	x	x	x	x	.	.	x	x	x	x	x	.	Uncommon
Milvago chimachima	x	x	x	x	x	x	x	x	x	x	x	x	Fairly common resident
Polyborus plancus	x	x	x	x	.	x	.	.	.	x	.	.	Occasional
Falco femoralis	.	.	.	.	.	.	.	x	.	x	.	.	Rare vagrant; 1979
Falco sparverius	.	x	x	x	.	.	.	x	.	x	.	x	Occasional
CRACIDAE (1)													
Ortalis ruficauda	B	B	B	x	x	x	x	x	x	B	x	B	Abundant resident
PHASIANIDAE (2)													
Colinus cristatus	x	x	x	x	x	x	x	B	B	B	x	x	Fairly common resident
Odontophorus columbianus	.	x	.	.	x	.	.	.	.	.	.	.	Rare; one 1966 & 1967
RALLIDAE (1)													
Aramides cajanea	x	x	x	x	x	x	x	x	x	x	x	x	Uncommon resident
JACANIDAE (1)													
Jacana jacana	.	.	.	.	.	.	.	x	.	.	.	.	Rare; seasonal pond 1981
COLUMBIDAE (7)													
Columba cayennensis	.	.	.	.	.	.	x	.	.	.	.	.	Rare
Columbina passerina	.	B	x	x	x	.	.	x	x	x	x	.	Occasional
Columbina minuta	x	x	x	x	x	x	x	.	.	B	x	x	Uncommon
Columbina talpacoti	x	(B)	B	x	x	x	B	B	B	B	x	(x)	Fairly common resident
Claravis pretiosa	.	.	.	x	.	B	B	x	.	x	.	.	Occasional seasonal migrant
Scardafella squammata	B	x	x	x	x	x	x	x	x	x	x	x	Common resident
Leptotila verreauxi	x	x	x	B	B	B	x	x	x	x	x	x	Abundant resident

APPENDIX
Continued

Family and species	J	F	M	A	M	J	J	A	S	O	N	D	Abundance
PSITTACIDAE (2)													
Aratinga pertinax	x	x	B	B	x	x	x	x	x	x	x	x	Common resident
Forpus passerinus	x	x	x	x	x	.	x	.	x	x	x	x	Fairly common
CUCULIDAE (8)													
Coccyzus americanus	.	.	.	.	.	.	.	.	.	.	x	.	Rare N. Am. migrant
Coccyzus melacoryphus	.	.	.	.	x	x	x	x	B	x	.	.	Occasional austral migrant
Coccyzus lansbergi	.	.	.	.	.	x	x	x	x	x	x	x	Occasional austral migrant
Piaya cayana	x	x	x	x	B	x	x	(x)	x	x	x	x	Fairly common resident
Piaya minuta	.	x	.	.	.	.	.	.	.	.	.	.	Rare vagrant; 1982
Crotophaga ani	x	x	x	x	x	x	x	x	x	x	x	x	Common resident
Crotophaga sulcirostris	x	x	x	x	x	x	x	x	x	.	.	x	Fairly common
Tapera naevia	x	x	x	x	B	B	B	x	x	x	x	x	Common resident
STRIGIDAE (3)													
Otus choliba	x	B	B	B	x	x	x	x	x	x	x	x	Common resident
Glaucidium brasilianum	x	x	x	x	.	x	x	x	x	x	x	x	Fairly common
Rhinoptynx clamator	x	x	x	x	x	x	x	x	x	x	x	x	Common resident
CAPRIMULGIDAE (2)													
Nyctidromus albicollis	x	x	B	B	B	B	x	x	x	x	x	x	Common resident
Caprimulgus rufus	.	x	.	x	x	x	.	.	.	.	.	.	Occasional austral migrant
NYCTIBIIDAE (1)													
Nyctibius griseus	x	x	.	x	x	x	x	x	x	x	x	x	Fairly common
APODIDAE (2)													
Streptoprocne zonaris	x	x	.	.	.	.	.	.	.	.	.	.	Rare vagrant
Panyptila cayennensis	.	.	.	.	.	.	.	.	.	.	x	.	Rare vagrant
TROCHILIDAE (11)													
Glaucis hirsuta	x	x	x	x	x	x	.	.	x	x	x	x	Occasional
Phaethornis augusti	(x)	x	B	B	B	B	B	x	B	x	x	x	Common resident
Phaethornis longuemareus	x	.	.	x	.	.	.	.	.	x	.	.	Rare
Colibri coruscans	x	.	.	.	.	.	.	.	.	.	.	.	Rare
Anthracothorax nigricollis	.	x	x	.	.	.	.	.	.	x	.	.	Rare
Klais guimeti	.	.	x	.	x	.	.	.	.	.	x	.	Rare
Chlorostilbon mellisugus	(B	x)	x	x	x	x	x	B	B	x	B	B	Common resident
Amazilia fimbriata	x	x	x	x	x	x	x	x	B	B	x	x	Common resident
Amazilia tobaci	(x)	x	x	x	x	.	.	.	.	x	x	x	Occasional seasonal migrant
Amazilia tzacatl	x	.	.	.	.	.	.	.	.	.	.	.	Rare; 1977 & 1980
Chalybura buffonii	x	x	.	x	.	.	.	.	.	.	.	x	Occasional
TROGONIDAE (1)													
Trogon collaris	.	.	.	.	.	.	.	.	.	x	.	.	Rare; 3 together 1979
BUCCONIDAE (1)													
Hypnelus ruficollis	x	x	x	x	x	x	x	x	x	x	x	x	Fairly common resident
GALBULIDAE (1)													
Galbula ruficauda	x	B	B	B	B	x	x	x	(x)	x	x	x	Common resident
PICIDAE (6)													
Picumnus squamulatus	x	x	B	x	x	x	B	x	B	B	B	x	Common resident
Chrysoptilus punctigula	x	.	x	B	B	.	.	x	x	x	.	x	Uncommon
Piculus rubiginosus	.	.	B	.	.	.	.	.	.	.	.	.	Rare vagrant, forest
Dryocopus lineatus	x	x	x	x	x	.	.	x	x	x	.	x	Occasional
Melanerpes rubricapillus	x	x	B	B	B	x	x	x	x	x	x	x	Common resident
Veniliornis kirkii	B	x	B	B	x	.	x	x	x	x	x	x	Uncommon resident

APPENDIX
Continued

Family and species	J	F	M	A	M	J	J	A	S	O	N	D	Abundance
FURNARIIDAE (6)													
Synallaxis albescens	x	B	x	B	x	B	B	B	x	x	x	x	Common resident
Synallaxis cinnamomea	.	x	x	.	.	.	.	.	.	x	.	.	Rare
Cranioleuca subcristata	x	x	B	x	x	x	B	.	.	x	.	.	Occasional
Phacellodomus rufifrons	(x	x)	x	x	x	B	B	B	B	x	x	(x)	Common resident
Syndactyla guttulata	.	.	x	.	x	.	.	.	.	.	.	.	Rare
Xenops minutus	.	.	x	x	.	.	.	.	.	.	.	.	Rare; only 1988
DENDROCOLAPTIDAE (6)													
Dendrocincla fuliginosa	x	x	.	.	.	.	.	.	.	.	x	.	Uncommon
Sittasomus griseicapillus	x	x	x	B	B	x	x	x	x	x	x	x	Uncommon resident
Xiphocolaptes promeropirhynchus	.	.	.	x	.	.	.	.	.	.	.	.	Rare
Xiphorhynchus guttatus	x	x	x	x	x	.	.	.	.	x	x	.	Occasional
Lepidocolaptes souleyetii	x	x	x	x	x	.	B	.	x	(x)	x	.	Uncommon resident
Campylorhamphus trochilirostris	x	x	x	x	x	x	x	x	x	x	x	x	Fairly common resident
FORMICARIIDAE (7)													
Taraba major	x	x	x	x	x	x	x	B	x	(x)	x	x	Fairly common resident
Thamnophilus doliatus	(x)	x	x	x	B	B	(x)	x	x	x	x	x	Common resident
Herpsilochmus rufimarginatus	.	.	.	x	.	.	.	.	.	.	.	.	Rare
Formicivora grisea	x	x	x	x	x	x	x	x	x	(x)	x	x	Common resident
Drymophila caudata	.	.	x	x	x	B	.	.	.	.	.	.	Occasional
Myrmeciza longipes	x	x	x	x	B	B	x	x	(x	x	x)	x	Fairly common resident
Grallaricula ferrugineipectus	x	x	x	.	.	.	.	.	.	.	.	x	Rare
TYRANNIDAE (26)													
Zimmerius vilissimus	x	x	.	.	.	.	.	.	.	.	.	.	Rare
Camptostoma obsoletum	x	x	x	x	B	x	x	x	x	x	x	x	Common resident
Phaeomyias murina	x	x	x	x	x	x	x	x	x	x	x	x	Fairly common resident
Sublegatus arenarum	x	.	.	x	.	.	x	.	.	x	x	.	Occasional
Myiopagis gaimardii	.	x	.	.	.	.	.	.	.	.	.	.	Rare
Myiopagis viridicata	.	x	x	x	x	x	x	x	.	(x	x)	x	Uncommon
Elaenia flavogaster	x	(x)	x	x	x	x	x	x	x	x	x	x	Common resident
Elaenia parvirostris	.	.	.	.	x	x	x	x	x	.	.	.	Uncommon austral migrant
Euscarthmus meloryphus	x	x	x	x	B	B	x	x	x	x	(x)	x	Common resident
Mionectus olivaceus	x	.	.	x	.	.	.	.	.	.	.	.	Rare
Leptopogon superciliaris	x	B	B	B	B	x	.	.	.	x	x	.	Fairly common
Phylloscartes flaveola	x	x	x	x	x	x	x	x	x	x	x	x	Common resident
Atalotriccus pilaris	x	x	x	B	B	B	x	x	(x)	x	x	x	Common resident
Todirostrum cinereum	x	x	x	B	B	B	B	B	x	(x	x)	x	Common resident
Tolmomyias flaviventris	.	.	.	.	.	.	.	x	.	.	.	.	Rare
Myiophobus fasciatus	x	B	B	B	B	B	(B	x	x)	x	x	x	Common resident
Contopus cinereus	x	x	.	.	.	.	.	.	.	x	.	.	Rare
Contopus fumigatus	.	.	x	.	.	.	.	.	.	x	.	.	Rare, forest
Cnemotriccus fuscatus	x	x	x	x	x	B	x	x	(x	x)	x	x	Fairly common resident
Myiarchus tyrannulus	x	B	B	B	B	B	x	x	x	x	x	x	Common resident
Pitangus sulphuratus	x	B	B	B	B	B	x	x	(x)	x	x	x	Abundant
Megarhynchus pitangua	x	x	x	x	x	B	x	x	x	x	x	x	Uncommon

APPENDIX
Continued

Family and species	J	F	M	A	M	J	J	A	S	O	N	D	Abundance
Myiozetetes cayanensis	.	.	x	x	.	.	x	x	x	x	.	.	Occasional
Myiozetetes similis	x	x	x	B	B	B	x	.	.	x	x	x	Occasional
Myiodynastes maculatus	.	.	.	x	B	.	.	.	.	.	.	.	Rare vagrant
Tyrannus melancholicus	x	x	x	x	x	x	x	x	x	x	x	x	Fairly common resident
COTINGIDAE (3)													
Pachyramphus rufus	x	x	x	x	x	x	.	B	x	x	x	x	Fairly common
Pachyramphus castaneus	.	x	x	.	.	.	.	.	.	.	.	.	Rare; 1970 & 1977
Pachyramphus polychopterus	.	x	.	.	x	x	.	.	.	.	.	.	Rare
PIPRIDAE (1)													
Chiroxiphia lanceolata	x	x	x	x	B	B	x	.	x	x	x	x	Fairly common resident
HIRUNDINIDAE (3)													
Notiochelidon cyanoleuca	x	x	x	B	x	.	x	x	x	x	.	x	Occasional
Stelgidopteryx ruficollis	x	x	x	x	B	x	x	x	x	x	x	x	Occasional
Hirundo rustica	.	.	.	.	.	.	.	.	.	.	.	x	Rare N. Am. migrant
TROGLODYTIDAE (4)													
Campylorhynchus nuchalis	x	B	x	x	B	x	x	x	x	x	x	x	Fairly common resident
Thryothorus genibarbis	x	x	x	B	B	x	x	x	x	(x)	x	x	Fairly common resident
Thryothorus rutilus	x	x	x	x	B	B	B	x	x	x	x	x	Common resident
Troglodytes aedon	x	x	x	x	x	x	B	B	B	x	x	x	Common resident
MUSCICAPIDAE (8)													
Ramphocaenus melanurus	x	B	x	x	x	x	x	.	x	x	x	.	Occasional
Polioptila plumbea	x	x	x	B	B	B	x	B	x	x	x	x	Abundant resident
Catharus aurantiirostris	x	x	x	x	x	x	x	x	x	x	x	.	Occasional, resident
Catharus fuscescens	.	.	.	.	.	.	.	.	.	x	.	.	Rare N. Am. migrant
Catharus minimus	.	.	.	x	.	.	.	.	.	.	x	.	Rare N. Am. migrant
Turdus leucomelas	x	x	x	B	B	B	x	x	x	x	x	x	Common resident
Turdus fumigatus	.	.	.	.	.	.	.	x	.	.	.	.	Rare, forest
Turdus nudigenis	x	x	x	x	B	B	B	x	(x	x)	x	x	Common resident
MIMIDAE (1)													
Mimus gilvus	B	B	B	B	x	x	x	x	x	x	B	B	Common resident
VIREONIDAE (5)													
Cyclarhis gujanensis	x	x	x	x	B	B	x	x	x	(x)	x	x	Common resident
Vireo olivaceus	.	x	x	x	x	.	.	x	.	.	.	.	Occasional
Vireo gilvus	.	.	.	.	.	.	.	.	.	x	.	.	Rare
Hylophilus aurantiifrons	x	x	x	x	x	x	.	B	(x	x)	x	x	Fairly common resident
Hylophilus flavipes	.	x	x	x	x	x	x	x	x	x	x	.	Uncommon
EMBERIZIDAE (53)													
Vermivora peregrina	x	.	.	x	.	.	.	.	.	.	.	.	Rare N. Am. migrant
Parula pitiayumi	.	x	x	x	.	.	.	.	.	.	x	.	Uncommon
Dendroica petechia	.	x	x	x	.	.	.	.	.	.	x	.	Rare N. Am. migrant
Dendroica striata	.	.	.	.	x	.	.	.	.	x	.	.	Rare N. Am. migrant
Setophaga ruticilla	x	x	x	x	x	.	.	.	.	x	x	x	Occasional N. Am. migrant
Seiurus noveboracensis	x	.	.	.	x	.	.	.	.	x	.	.	Rare N. Am. migrant
Geothlypis aequinoctialis	.	x	x	x	x	.	x	x	x	.	x	x	Occasional
Oporornis agilis	.	.	.	x	.	.	.	.	.	x	.	.	Rare N. Am. migrant
Myioborus miniatus	.	.	x	.	.	.	.	.	.	x	x	.	Rare, forest
Basileuterus culicivorus	x	x	x	x	x	.	x	.	x	x	x	x	Occasional
Basileuterus flaveolus	.	.	.	.	x	.	x	.	.	.	.	x	Rare

APPENDIX
Continued

Family and species	J	F	M	A	M	J	J	A	S	O	N	D	Abundance
Coereba flaveola	B	B	B	B	B	x	B	B	B	x	x	B	Abundant resident
Thlypopsis fulviceps	x	B	x	x	x	.	x	x	x	x	x	x	Occasional, resident
Rhodinocichla rosea	x	x	x	x	x	x	x	B	x	x	x	x	Fairly common
Tachyphonus rufus	x	x	x	x	B	B	B	B	(x	x	x)	x	Abundant resident
Piranga rubra	.	.	x	.	.	.	.	.	.	x	x	.	Rare N. Am. migrant
Ramphocelus carbo	x	x	x	x	x	x	B	B	x	x	x	x	Common resident
Thraupis episcopus	x	x	x	B	B	B	B	B	B	x	x	x	Common resident
Thraupis sayaca	.	.	.	B	B	.	x	(x)	x	.	.	.	Occasional
Thraupis palmarum	.	.	.	x	.	.	x	x	x	.	x	.	Uncommon
Euphonia trinitatis	x	B	x	B	x	.	x	x	x	x	.	x	Uncommon
Euphonia laniirostris	x	x	B	B	B	x	B	B	x	x	x	x	Fairly common resident
Euphonia xanthogaster	x	.	x	.	.	.	.	.	.	.	.	.	Rare; 1968 only
Tangara guttata	.	.	x	x	x	.	x	.	.	x	x	.	Uncommon
Tangara cayana	x	x	x	B	B	x	B	(x)	x	x	(B)	x	Fairly common
Tangara cyanoptera	.	.	x	x	x	.	x	x	.	B	x	.	Uncommon resident
Cyanerpes caeruleus	.	.	.	.	.	.	.	.	.	x	x	.	Rare, forest
Tersina viridis	.	.	.	x	B	.	.	.	.	x	.	.	Uncommon austral migrant
Saltator coerulescens	(x)	x	B	x	B	B	B	(x	B)	x	x	x	Common resident
Saltator albicollis	x	x	x	x	x	x	x	x	x	x	x	x	Fairly common resident
Pheucticus ludovicianus	.	.	.	.	.	.	.	.	.	x	.	.	Rare N. Am. migrant
Cyanocompsa brissonii	x	x	B	x	B	B	x	x	x	x	x	x	Fairly common resident
Coryphospingus pileatus	x	x	x	x	x	x	B	x	x	x	x	x	Uncommon
Atlapetes semirufus	.	.	.	.	x	.	x	.	.	.	.	.	Rare
Arremon schegeli	(x)	x	x	x	x	x	.	.	x	.	x	x	Occasional
Arremonops conirostris	x	x	x	B	B	B	B	B	B	(x	x)	x	Common resident
Volatinia jacarina	.	x	x	x	x	B	B	B	B	x	x	x	Uncommon
Sporophila intermedia	x	x	x	x	x	x	x	x	B	x	x	x	Fairly common
Sporophila bouvronides	.	.	.	.	.	.	x	x	x	x	.	.	Occasional austral migrant
Sporophila nigricollis	x	x	x	x	.	x	x	B	B	B	x	x	Fairly common
Sporophila obscura	(x	x)	.	.	.	.	.	.	.	.	.	.	Rare
Sporophila minuta	x	x	x	x	x	.	x	.	x	.	.	.	Occasional
Oryzoborus angolensis	.	.	.	.	.	.	.	.	.	x	.	.	Rare
Tiaris bicolor	.	x	.	.	.	.	.	.	.	.	.	.	Rare
Sicalis flaveola	x	x	x	x	x	.	x	x	B	B	x	x	Uncommon
Quiscalus lugubris	x	x	x	x	x	B	x	x	x	.	.	.	Uncommon
Molothrus bonariensis	x	x	x	x	B	B	B	x	x	x	x	x	Common resident
Icterus auricapillus	x	x	x	x	x	x	.	B	B	B	x	B	Fairly common resident
Icterus icterus	.	.	.	.	.	.	x	.	.	.	.	.	Rare
Icterus nigrogularis	x	x	x	x	.	x	B	x	x	x	x	x	Common resident
Cacicus cela	x	x	x	x	.	.	.	.	.	B	x	.	Occasional
Psarocolius decumanus	x	x	x	x	x	x	x	B	x	x	x	x	Uncommon
Gymnomystax mexicanus	x	x	x	x	x	x	x	x	x	B	x	(x)	Common resident
FRINGILLIDAE (1)													
Carduelis psaltria	(x)	x	x	x	x	x	.	x	x	B	x	x	Occasional

The status of the *Cisticola aberrans* subspecies *C. a. nyika* Lynes, 1930

by P. A. Clancey

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In proposing *Cisticola aberrans nyika* from the Nyika Plateau of north-western Malawi/adjacent north-eastern Zambia, Lynes (1930) demonstrated that the populations of the Lazy or Rock Cisticola *Cisticola aberrans* (Smith), 1843 north of the arid mid-Limpopo river valley differed significantly from those occurring to the south of it in having a terminally patterned rather than plain tail. In Clancey (1989) it was suggested that the difference in the tails between the two groups of populations might, after further research, be found to warrant a further breakdown of the *C. aberrans* superspecies by the recognition of *nyika* as an allospecies discrete from the other two currently admitted: *C. aberrans* subspp. and *C. emini* subspp. (which includes *C. e. lurio* Vincent, 1933); see Sibley & Monroe (1990). Conclusions reached on this issue resulting from recent study of material are present below.

In Hall & Moreau (1970) the range of *C. a. nyika* is shown as terminating, in association with the Miombo woodland savanna, well to the north of the Limpopo valley and the border between the Transvaal and Zimbabwe. The more extensive material now available since Lynes' *Cisticola Review* of 1930 reveals that a subterminally spotted tail-character—the diagnostic criterion of *nyika*—is not lost to the north of the Limpopo, but persists in the population to the immediate south of the mid-Limpopo valley in the Soutpansberg Range of the northern Transvaal, including the western outlier of the Blouberg at *c*. 23°S. It fades out immediately further south on the Transvaal plateau, but, interestingly, is adumbrated in some specimens of *C. a. minor* examined from the Lebombo Mountains of northeastern Zululand, eastern Transvaal, Swaziland and adjacent southern Mozambique. Smithers *et al*. (1957) record that in a sample of four specimens from the Matopos Hills of southwestern Zimbabwe, on the arid periphery of the species' range in this sector, three lacked tail-spots, while the fourth had a spotted tail as in the norm of *C. a. nyika*. In a larger sample of seven Matopos Hills *C. aberrans* in the collection of the Durban Natural Science Museum all have spotted tails. All that can be deduced from the specimen evidence is that the transition from having a spotted to a plain tail is not as sharply delineated as first believed, but is widely and irregularly disposed between *c*. 20°30′ and 23°S.

Turning to the mensural variation found in the same group of populations, reference to Table 1 will show that the birds present north of the arid mid-Limpopo (*C. a. nyika* (a)) have in the male a mean wing-length of 55.2, *versus* 57.4, and a mean tail-length of 59.7, *versus* 65.2 mm in *C. a. aberrans* of the Transvaal plateau to the south of the *Brachystegia* (Miombo) woodland savanna. In females in non-breeding dress, the mean wing-length of *nyika* (a) is 49.2, against 51.9, and tail-length 53.0 as

TABLE 1

Wing- and non-breeding tail-lengths (mm) of subspecies of *Cisticola aberrans*

Subspecies (south to north)		*n*	Wing mean and range	*n*	Tail (non-breeding) mean and range
C. a. minor	♂♂	21	51.07, s.d. 1.44 (49–54)	12	65.1, s.d. 2.95 (60–70.5)
	♀♀	11	46.18, s.d. 0.90 (44.5–47)	9	55.3, s.d. 2.65 (50.5–58)
C. a. aberrans	♂♂	12	57.4, s.d. 2.17 (54.5–61)	12	65.2, s.d. 2.07 (63–69)
	♀♀	13	51.9, s.d. 2.45 (49–55)	7	61.7, s.d. 2.15 (60–65)
C. a. nyika (a) south of 16°S	♂♂	14	55.2, s.d. 1.05 (52–56.5)	14	59.7, s.d. 2.54 (55–63)
	♀♀	7	49.2, s.d. 0.80 (48–50)	3	53.0 (52–54)
C. a. nyika (b) north of 16°S	♂♂	10	59.5, s.d. 1.54 (57.5–62)	10	62.7, s.d. 2.71 (59–67.5)
	♀♀	8	51.3, s.d. 0.99 (50.5–53)	8	56.0, s.d. 2.82 (52–59)

Note: Males of *C. a. minor* are longer winged and tailed than females and both acquire shorter tails prior to breeding (from late September); nominate *aberrans* is longer winged but not longer tailed than *minor*, except in the female which alone acquires a short nuptial tail. In contrast with these austral forms, *nyika* (a) approximates to nominate *aberrans* in wing-length, but has the tail terminally patterned and shorter in both sexes; again only the female moults in a short nuptial tail. Compared with the last, *C.a. nyika* (b) has a longer wing, the mean difference 4.3, whereas the tail is only moderately longer (mean 3.0 mm in both sexes). Males of *nyika* (b) range largest of all in the allospecies *C. aberrans*.

opposed to 61.7 mm. The size-differences exhibited by the birds on the two sides of the Limpopo valley are quite sharply defined, particularly in females, in which tail-lengths of *C. a. nyika in toto* measure 52–59 as opposed to 60–65 mm in nominate *aberrans* of the Transvaal plateau. It will also be appreciated that *nyika* itself encompasses a measure of clinal variation, being larger north of *c.* 16°S in association with the western Rift highlands of Malawi, declining relatively steeply southwards to 20°30′S. To the south of this, in correlation with a shift in the environment, size increases appreciably (in *C. a. aberrans*) to decline again in the southern terminal humid lowlands populations resident from the eastern Cape and Transkei and Natal and Zululand to the Lebombo Mountains (<610 m). The assumption of a partial breeding dress, which may affect both sexes, as in *C. a. minor*, or the female only in both nominate *aberrans* and *C. a. nyika*, may be associated in part with the variation in overall size (see Table 1 and comments thereto).

As shown above, the patterned *versus* unpatterned tail-character does not substantiate the viewing of the populations of *C. aberrans* to the north and south of the Limpopo valley as belonging to two allospecies of the *C. aberrans* superspecies. A comparable conclusion was arrived at in respect of the abruptly stepped transition in the case of wing- and tail-lengths differentiating *C. a. aberrans* and *C. a. nyika*, which is closely associated with the faunal barrier presented by the arid Limpopo, but is clearly of no more than subspecific significance. The bridging of the Limpopo valley by the tail-character and the subspecific rating of the size-differences confirm that *C. a. nyika* should remain part of the *C. aberrans* allospecies. Of biogeographical significance is that *nyika* lies in a somewhat comparable state, but in this instance parapatrically, with *lurio* along the Rift of southern Malawi, which latter is a subspecies of the *C. emini* allospecies of Sibley & Monroe.

Two other taxonomic issues affecting *C. aberrans* may be dealt with in the course of this contribution. Firstly Traylor and other authors, following Lynes (1930), give the type-locality of *C. a. nyika* as the Nyika Plateau at *c.* 457 m (1500 ft) a.s.l. The type-specimen, however, seemingly came from the Miombo woodland apron at the level of the continental plateau at this point and not the plateau of the massif as such, which latter lies between 1737 and 2440 m. Benson *et al.* (1971), in their Zambian work, list only *C. njombe* from the Nyika massif, which is stated as occurring from 6300 ft (to 8000 ft (2438 m) in the eastern Malawi sector of the same montane area). *C. a. nyika* is not mentioned as occurring even at the base of the Nyika, but is listed from the Mafinga Mts, Mt Sunzu, the Muchinga Escarpment and elsewhere in eastern Zambia, and, of course, occurs at points in montane western Malawi. The type-locality should, therefore, be given as the Nyika massif at 457 m a.s.l., northwestern Malawi.

The higher altitudes of the Nyika are occupied by the sibling species *C. njombe*, described by Lynes in 1933 from near Njombe, southern Tanzania, at *c.* 1981 m, a denizen of bracken stands, and by *Cisticola lais semifasciata* Reichenow, 1905: Mlanje (=Lichenya Plateau), southern Malawi, and not by *C. a. nyika*. The altitudinally stratified ranges of these small cisticoline warblers are seemingly concordant with those of certain *Anthus* spp. occurring in the same general area of Africa.

The second issue to be dealt with stems from the finding of elements of three races of the Lazy Cisticola in the Transvaal (nominate *aberrans*, *minor* and *nyika*), which necessitates the fixing of a definite type-locality for nominate *aberrans*, currently standing as simply "interior S.Afr." (see Traylor 1986). As Dr Andrew Smith, the original collector and describer, operated mainly in the Marico district of the southwestern Transvaal during the course of his exploratory sojourn of the mid-1830s, I propose to restrict the type-locality of *Drymoica aberrans* Smith, 1843 to the Marico district, southwestern Transvaal, as being in accord with the known history of both the discovery and naming of this species.

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A new Amazonian subspecies of the Ruddy-tailed Flycatcher *Myiobius (Terenotriccus) erythrurus*

by Kenneth C. Parkes & Robin K. Panza

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The Ruddy-tailed Flycatcher *Myiobius erythrurus* is a tiny (wing *c*. 48–53 mm) tyrannid with a wide range in the Neotropics from southern Mexico to Peru and Brazil. In most of the literature this species is placed in the monotypic genus *Terenotriccus*, but Lanyon (1988) presented convincing evidence that this genus should be recombined with *Myiobius* (from which it had originally been split), and this treatment was followed in the world list of Sibley & Monroe (1990).

Carnegie Museum of Natural History holds a series of this species from the middle Rio Purús, Brazil. The ranges of subspecies given by Traylor (1979) omit this area. That of *M. e. amazonus* Zimmer is given as along the south bank of the Amazon itself, from the left bank of the Rio Purús east to the right bank of the Rio Tapajós. Traylor mentioned that *amazonus* ascends the Rio Madeira as far as the mouth of the Rio Jiparaná, but said nothing about the Rio Purús beyond its mouth on the Amazon, in spite of the fact that Gyldenstolpe (1951) had reported two specimens from Labrea, at about the same latitude on the Purús as the Jiparaná lies on the Madeira. Gyldenstolpe was unable to assign a subspecific name to his specimens, but his comparisons with 5 specimens of *M. e. amazonus* and 6 of *M. e. brunneifrons* Hellmayr, a race that occurs on the Rio Juruá some 600 km W of Labrea, make it obvious that his birds match those in the Carnegie series from localities on the Purús about 300 km downstream and about 130 km upstream from Labrea, respectively. The full range of *brunneifrons*, as given by Traylor (1979), is "eastern Peru south of the Marañon, southwestern Brazil on upper Rio Juruá and possibly southeast to upper Rio Roosevelt, and northwestern Bolivia"; if accurate, this means that the range of *brunneifrons* forms a large arc to the west and south of the Rio Purús.

As Gyldenstolpe suggested tentatively, the Rio Purús specimens cannot be assigned to any presently recognized subspecies. Although the Rio Purús population is almost encircled by *M. e. brunneifrons* and

M. e. amazonus, it is by no means intermediate between these two subspecies, and merits a name of its own. It may be called

Myiobius erythrurus purusianus subsp. nov.

Holotype. Carnegie Museum of Natural History 86534, adult male collected at "Hyutanahan" (=Huitanaã, 7°40′S, 65°46′W, of Paynter & Traylor 1991), middle Rio Purús, Amazonas, Brazil, by S. M. Klages on 20 Dec 1921. Field Number 27933.

Diagnosis. Differs from *brunneifrons* Hellmayr, the next race to the west and south, in having the crown and forehead concolorous rather than having the forehead brighter and more rufescent; dorsum less olivaceous, with more of an orange tint, the rump being especially brighter; edges of remiges and wing coverts decidedly paler, less rufous, more buffy; rectrices paler at the base rather than uniformly rufous for their full length; underparts decidedly paler, with less of a concentration of pigment forming an incipient breast band. Differs from *amazonus* Zimmer, the next race to the north and east, in having the back brighter, less olivaceous; the rump much brighter, and the mantle and crown essentially concolorous—in *amazonus* the crown is more leaden in colour than the back; edges of remiges and wing coverts contrast more with the centres of the feathers; underparts slightly paler in general, with chin and throat tending toward white.

Distribution. Known from three localities on the middle Rio Purús, Amazonas, Brazil; from north to south (upstream), Arimã, Labrea, and Huitanaã.

Notes on other subspecies. Carnegie Museum of Natural History has a specimen of *M. e. signatus* Zimmer, previously known from southeastern Colombia, eastern Ecuador, and northeastern Peru, that extends the range of this subspecies into Brazil. It was taken by Klages at Tonantíns, on the Rio Solimões, about 400 km downstream (about 300 air km NE) of the joint Colombia-Peru-Brazil border.

The Carnegie specimens of *M. e. brunneifrons*, which were listed by Remsen *et al.* (1987) as two of the first four specimens from the Department of Santa Cruz, Bolivia, appear to be the easternmost specimens of that race. They were listed as being from Buena Vista; more precisely, they were collected by Steinbach at nearby Río Yapacaní.

Specimens examined. M. e. brunneifrons: BOLIVIA, Dept. Santa Cruz, Río Yapacaní, 2. *M. e. signatus*: BRAZIL, Est. Amazonas, Tonantíns, 1. *M. e. purusianus*: BRAZIL, Est. Amazonas, Huitanaã, 11; Arimã, 6. *M. e. amazonus*: BRAZIL, Est. Pará, Vila Braga, 7; Apacy, 3.

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New and reconfirmed birds from the state of São Paulo, Brazil, with notes on disappearing species

by Edwin O. Willis & Yoshika Oniki

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In 1985, we reported on new specimens of birds from the state of São Paulo in southeastern Brazil. Our field studies since 1975 have discovered 26 species new for the state. Three have been since confirmed by specimens, and all have been reported from nearby states. Two other species were discovered by colleagues, another by a student, a fourth by a visitor, and reconfirmed by Willis. Several other new species, not noted here, are to be reported by D. F. Stotz and P. Martuscelli (pers. comm.). A further supposed 'species' has been seen, but we think it a hybrid. Here we report on our new birds and other species reconfirmed for the state, as well as on species that seem to be disappearing.

New species

SOUTHERN POCHARD *Netta erythrophthalma*

A pair in a shallow pond (20°39′S, 48°04′W) in sugar cane fields alongside Mata Chita, Morro Agudo, on 6–7 March 1984, was the first state record (Willis 1992). Alvarenga (1990) later collected a specimen from the Paraiba River Valley, and the bird has been seen since August 1987 at the Tietê Ecological Park in the city of São Paulo, where it is present mainly in winter (D. F. Stotz pers. comm.). Invading eutrophic sunny runoff ponds from the north with deforestation.

GREY HAWK *Buteo nitidus*

One screamed at Willis on 4 March 1984 at isolated Mata Taboão (20°46′S, 47°48′W), east of Sales Oliveira, and a pair did so by an isolated patch of woods (19°56′S, 49°32′W) just west of the main woodlot of the Paulo de Faria State Reserve on 14 October 1987. The species may be invading the state at man-made forest edges, or may have been present at natural edges of these northwestern deciduous woodlands.

CHIMANGO CARACARA *Milvago chimango*

Willis and students saw one on the dunes near the northeast end of Ilha Comprida (24°41′S, 47°26′W) on 8 November 1986. Willis saw individuals on the beach a few kilometres southwest, 5 July 1989 and 16 June

1990. The species seems to be spreading northeast along the beaches of southeastern Brazil, due partly to clearing for vacation homes, mainly as a winter visitor.

AZURE GALLINULE *Porphyrula flavirostris*

Willis saw one early on the morning of 1 January 1987, at the edge of a *varzea* (seasonally flooded vegetation) pond near the Paraná River at soon-to-be-flooded Lagoa São Paulo (21°40′S, 52°02′W). It climbed on grass stalks to bend them to the water and eat seeds. Probably regular in summer in marshes of the west, but likely to disappear as the rivers become reservoirs.

TWO-BANDED PLOVER *Charadrius falklandicus*

We found two separate individuals by the ocean on beaches of Ilha Comprida, 7 July 1983, well southwest of the first *M. chimango* record. The species may be regular as a midwinter visitor, but we have not seen it on a few such visits since 1983. Humans swarm to São Paulo beaches, drastically limiting shorebirds, and the process is starting on Ilha Comprida with plans for a bridge at its northeast end.

WHIMBREL *Numenius phaeopus*

One on the semi-open storm-cleared zone at the northeast tip of Ilha Comprida, 16 June 1990 (Willis).

RED-BELLIED MACAW *Ara manilata*

A bird of *buriti* (*Mauritia* sp.) groves south to Minas Gerais, found by Willis in the disappearing *buriti* gallery woods of northern São Paulo in 1987 (10 September, pair visiting cavity in broken *buriti* stub near the busy highway at 20°13′S, 47°50′W, Buritizal township; also 20°14′S, 47°42′W near town and maximum of seven at the Boca do rio das Pedras, 20°11′S, 47°53′W, on 29 October).

LEAST NIGHTHAWK *Chordeiles pusillus*

Dickerman (1988) incorrectly reported the Least Nighthawk from São Paulo, thinking Natterer's "Nos Puritis" (Buritis) to be in São Paulo when it is in Goiás. It does occur south to northern São Paulo, however, as Willis found several at the Fazenda Ribeirão do Cervo (21°8′S, 47°21′W) 10 March 1984. Later he found it at Pedregulho (20°15′S, 47°27′W) and Rifaina (20°6′S, 47°24′W) as well as just west of the Ilha Solteira dam in Mato Grosso do Sul (Fazenda UNESP, 20°23′S, 51°23′W).

FORK-TAILED PALM-SWIFT *Tachornis squamatus*

We found Fork-tailed Palm-swifts in royal palms of the central plaza in Batatais (20°51′S, 47°35′W), 1 April 1983. They are regular in *buriti* and other palm groves of the north, from near Morro Agudo (20°39′S, 48°4′W) to Rifaina, and occur in *buritis* near Selvíria, Mato Grosso do Sul (20°28′S, 51°30′W).

LONG-BILLED STARTHROAT *Heliomaster longirostris*

We saw a female visiting *Hibiscus* sp. on 9 September 1981 at our home in Barão Geraldo, just north of Campinas at 22°50′S, 47°05′W. We do not know the basis for Meyer de Schauensee's (1970: 160) report or for that of Ruschi (1965) for *H. furcatus*. Either could wander southeast into the state, especially with forest destruction.

SPOT-BACKED PUFFBIRD *Bucco maculatus*

Willis found a pair in a patch of *cerrado* (savanna woodland) at km 69 (20°48′S, 47°44′W) east of Sales Oliveira on 5 March 1984, plus others in remnant dense *cerrados* near Pedregulho, Rifaina, Buritizal and Jeriquara in the same north-central region. At sunrise and sunset, they sing everywhere in such patches, rapidly being cleared because everybody mistakes natural savannas for worthless second-growth "scrub" while scientists say little to correct them.

ITATIAIA SPINETAIL *Oreophylax moreirae*

The serra de Queluz extends to above 2700 m southwest from Itatiaia as one of the wildest regions of São Paulo. On 18 April 1987, it took Willis a 16-hour hike (including return) to see this spinetail on the São Paulo side of Pico dos Três Estados at 2400 m (22°24′S, 44°48′W). Common in bushes above timberline and 2200 m all along the spectacular route there, on the border of Minas Gerais and Rio de Janeiro.

CHOTOY SPINETAIL *Synallaxis phryganophila*

Willis found a Chotoy Spinetail in bushes of a pasture of Fazenda Promissão, 11 km south of Nova Independência, north bank of the Aguapeí River (21°09′S, 51°35′W), on 4 January 1985. Probably invading the west of the state with forest cutting, but many of these pantanal birds may always have lived along the Paraná River.

CINEREOUS-BREASTED SPINETAIL *Synallaxis hypospodia*

Willis found one on 1 January 1985 in bushy pastures (21°00′S, 50°28′W) of Fazenda Macaúbas, near Santo Antonio de Aracanguá, and later others in similar bushy pastures at Lagoa São Paulo, 1 January 1987. Another scrubland and river-scrub species, recently found in northwestern Paraná State (F. Straube, I Brazilian Ornithol. Congress, Belém, July 1991).

RUFOUS-FRONTED THORNBIRD *Phacellodomus rufifrons*

Oniki spotted the first nests for the state on 1 April 1983 in a pasture tree of Fazenda Recanto da Mata (20°43′S, 47°31′W) by the highway just north of the Rio Sapucaí, and Willis soon found the birds in nearby scrub. On 9 March 1984 there was a nest just south of Altinópolis, in a pasture tree (21°03′S, 47°25′W) where there was no nest in 1983. Apparently spreading southwest with deforestation.

YELLOW-BREASTED FLYCATCHER *Tolmomyias flaviventris*

Willis found one in semi-open trees over cacao at Fazenda Capricórnio (23°23′S, 45°05′W), near Ubatuba, 11 August 1986 but not on other visits. Probably a winter wanderer from semi-deforested zones northeast in Rio de Janeiro, and may become established as northeastern São Paulo forests are cut for beach development.

LESSER KISKADEE *Pitangus lictor*

The characteristic *dree*, *dear-ur* call near an old oxbow (21°37′S, 47°49′W) of the Mogi-Guaçu River in the Luiz Antonio Experiment Station, 30 December 1982, presaged a rash of records by Willis at similar lagoons in the west and centre of the state: Teodoro Sampaio State Reserve (near Paraná); south of Lins on the Rio Feio (21°45′S, 49°50′W), Fazenda Anhangaí (20°53′S, 50°41′W), even a wanderer eating semi-frozen dragonflies atop twigs early 31 May 1984 at the Broa Reservoir (22°12′S, 47°52′W). Probably always present on western rivers, as recently reported from Argentina.

RUSTY-MARGINED FLYCATCHER *Myiozetetes cayanensis*

Willis found several pairs in the semi-wooded former 'mini-pantanal' of the lower Tietê River (20°54′S, 50°40′W), Fazenda Aracanguá, 24 April 1984 and later further down on Fazenda São Rafael (20°52′S, 50°57′W) in the north of the township of Mirandópolis. All sites are now under water of the Tres Irmãos Reservoir, but the species likely persists and was present long before man along water edges throughout the region.

PURPLISH JAY *Cyanocorax cyanomelas*

A Mato Grosso bird spreading east with deforestation; Willis saw one wanderer fly from isolated trees to the main woodlot of Mata Chita, Morro Agudo, on 9 September 1987. One would think of an escaped captive bird, but *Paroaria* wander even further southeast.

VEERY *Catharus fuscescens*

We obtained the first records 27–28 November 1982 in *cerrado* at the Porto Ferreira State Reserve (21°50′S, 47°26′W), with later records at several inland localities. Later it was collected in the Serra do Mar and at Iguape (Pereira *et al.* 1988). It seems uncommon but regular in the northern winter in secondary and similar woodlands, rare in primary forest.

SCREAMING COWBIRD *Molothrus rufoaxillaris*

We saw young on 16 December 1982 in a group of *Gnorimopsar chopi* at the lake (22°50′S, 49°15′W) of the state reserve of Aguas de Santa Barbara, mistaking them for *Molothrus badius* (not recorded from São Paulo, as our 1985 comment was incorrectly based on these records). Later collected, as we reported in 1985. Now regular, with flocks in winter, in the northwestern quarter of the state.

RED-LEGGED HONEYCREEPER *Cyanerpes cyaneus*

Willis found a pair in a flowering eucalyptus at the dam of the Horto Florestal, Rio Claro, in the winters of 1985, 1986 (Willis 1987) and 1987, while only a female was seen in 1988. Otherwise not recorded for the state, suggesting that pairs move together on migrations and revisit distant flowering trees that they have learned.

YELLOW-BILLED CARDINAL *Paroaria capitata*

Willis found one at the now flooded 'mini-pantanal' marshes of Fazenda Anhangaí (20°53′S, 50°41′W), on 23 April 1984. One was following the tiny Itaqueri River up to the *serra* above Broa Reservoir at 22°15′S, 47°52′W, 725 m elevation, on 28 December 1986, indicating that such birds can wander far looking for marshes and 'pantanals'; it had probably followed the Tietê and Jacaré-Guaçu rivers hundreds of kilometres to reach Broa.

DARK-THROATED SEEDEATER *Sporophila ruficollis*

Meyer de Schauensee (1970: 409) reported the species, perhaps based on Pinto's (1944) register of a bird that had lived 15 months in captivity.

Willis and T. Sigrist saw one male, changing from winter to summer plumage, in migrant flocks of *Sporophila hypoxantha* and *S. melanogaster* on the *campos* of Itirapina (22°14'S, 47°52'W) on 21 November 1988. These small 'caboclinhos' seem very close to the widespread *S. bouvreuil* and stop on the almost extirpated São Paulo *campos* in October and November, coming from winter sites east to Minas Gerais and going to nesting *campos* in Argentina and southern Brazil to Paraguay. Loss of São Paulo natural savannas may cause problems for migrations of these birds, as well as concentrate them in the places easily found by cage-bird fanciers. The conservation problem of these seedeaters is one of the worst in Brazil and Argentina, but has received almost no attention nationally or internationally. Proposed sand mining by international firms is only one of the problems.

CHESTNUT SEEDEATER *Sporophila cinnamomea*

Willis found males with migrant flocks of 'caboclinhos' on the *campos* of Itirapina 1 November 1988 and 22 October 1989, the last with head and neck plus a belly spot in summer plumage and the rest of the body in female-type plumage.

MARSH SEEDEATER *Sporophila palustris*

Willis found males with migrant flocks on the *campos* of Itirapina, 6 November 1988 and 29 October 1989. Not including the following 'species', fourteen *Sporophila* are registered from São Paulo, eleven of them from Itirapina.

Sporophila 'ardesiaca'

This supposed species appeared with seedeater flocks on the *campos* of Itirapina on 21 November 1988 (Willis and T. Sigrist). It is a black-headed *S. nigricollis* with the body (white belly and grey back) of *S. caerulescens*, and we think it is a hybrid between the two. Most hybrid birds in MZUSP come from the Rio Doce region of Espirito Santo and Minas Gerais, where the two forms meet: no. 25325 is like *S. nigricollis* but with the white moustache of *S. caerulescens* (Willis saw a similar bird by the CVRD Reserve at Linhares, Espirito Santo, 8 September 1989); no. 33894 is like *S. caerulescens* but with a dark throat and yellowish belly; no. 25337 is an '*ardesiaca*'. *S. nigricollis* appears at Itirapina and other places in northern São Paulo in October and November seedeater migrations, once even 8 January 1989 at the Broa *cerrado* (22°10'S, 47°52'W), and could well hybridize here in small numbers with *S. caerulescens*, an abundant species in the state. Rolf Grantsau (pers. comm.) says the two species have nearly the same song, the females are almost identical, and we feel Sick (1985 and earlier) should have decided that they hybridize to give various types of '*ardesiaca*' plumage with the sprinkling of *S. nigricollis* southward.

Reconfirmed species

JABIRU *Jabiru mycteria*

A nest was found in a tall tree on the lower Tietê, 'mini-pantanal' of Faz. Anhangaí, 24 April 1984 (Willis). A reservoir destroyed the whole region, once home of thousands of ducks, herons, storks and other water birds. Occasional westward, nesting mostly in the Pantanal along the Paraguay River.

SOUTHERN SCREAMER *Chauna torquata*
Willis found one at the edge of the new reservoir at Teodoro Sampaio on 12 July 1989 (22°38′S, 52°16′W). Few records, perhaps winter or wandering birds.

LESSER YELLOW-HEADED VULTURE *Cathartes burrovianus*
One over the soon-to-be-flooded pantanal of Lagoa São Paulo on 31 December 1986 (Willis). Only recorded a few times in the far west.

SWAINSON'S HAWK *Buteo swainsoni*
Willis and students found migrants over the *campos* of Itirapina on 24 November 1989, and he found another on 28 October 1991, probably strays east of the normal migratory route. Sick (1979) is the only previous report.

BLACK-COLLARED HAWK *Busarellus nigricollis*
Willis encountered lone birds on the 'mini-pantanal' of Fazenda São Rafael on 26 April 1984, along the ribeirão da Onça marsh (21°11′S, 48°05′W) west of Sertãozinho on 8 and 11 October 1985, at Lagoa São Paulo on 31 December 1986, and on the Teodoro Sampaio reservoir 2–3 January 1987. Likely regular in the west, but few records.

CROWNED EAGLE *Harpyhaliaetus coronatus*
Adult soaring 12 August 1984 over a busy highway at 960 m in the partly deforested Serra de Mantiqueira (23°10′S, 46°16′W) east of Nazaré Paulista (Willis). An immature was found shot on the serra da Bocaina on 23 June 1991 by A. A. Figueiredo Neto (MZUSP 70584; D. F. Stotz pers. comm.). Rarely found, perhaps regular on open serras.

BLACK-AND-WHITE HAWK-EAGLE *Spizastur melanoleucus*
Soaring and giving a series of peeps at noon high over the forest at Teodoro Sampaio (22°35′S, 52°21′W) on 12 July 1989 (Willis). D. F. Stotz (pers. comm.) saw one soaring at Boracéia on 25 February 1991. Few records.

ORNATE HAWK-EAGLE *Spizaetus ornatus*
Occasional birds in eastern forests only (Willis): 26 August 1987 at Intervales (Bocaina, 24°16′S, 48°26′W), Ilhabela (23°50′S, 45°20′W) on 11 September 1984, and Sete Barras (24°10′S, 47°56′W) on 24 September 1983. Few records.

LITTLE WOOD-RAIL *Aramides mangle*
Three in a very small patch of mangroves at the northeast end of Ilha Comprida on 16 June 1990 (Willis). They fly readily to high in the bushes, being small and probably light birds; descend to flick dead wet leaves with the bill. Several specimens in MZUSP from Icapara, just across the channel, plus other sightings north to Peruibe and south to Paraná in mangroves, at times with *A. cajanea* (D. F. Stotz & P. Scherer pers. comm.).

OCELLATED CRAKE *Micropygia schomburgkii*
Voice regular on the *campos* of the state reserve of Itapetininga (23°39′S, 47°59′W), recently ploughed by Instituto Florestal agronomists

to plant introduced trees, and on the *campos* of Itirapina (Willis). Few records.

SEMIPALMATED SANDPIPER *Calidris pusilla*

One on the beach across from the northeast end of Ilha Comprida, 24 June 1984 (Willis). A specimen collected by R. Grantsau on the Boracéia beach 30 October 1964 seems the first state record, a fact we overlooked in 1985. Probably regular, but crowds and cars leave little room for sandpipers on São Paulo beaches.

SOUTH POLAR SKUA *Catharacta maccormicki*

Rolf Grantsau (pers. comm.) has confirmed as a South Polar Skua the specimen we (1985) provisionally registered as "*Stercorarius pomarinus*?".

BAND-WINGED NIGHTJAR *Caprimulgus longirostris*

We found several on 26 January 1983 on the rocky tops of cliffs (24°18′S, 49°13′W) at the Agronomic Institute south of Itararé, and others singing on the *serra* near Itapirapuã (24°21′S, 49°10′W) on 15 August 1989. Few records, perhaps regular on high *serras*; does not seem to have invaded cities as in Rio de Janeiro (Sick 1985).

SPOT-TAILED NIGHTJAR *Caprimulgus maculicaudus*

Willis found several singing in pastures along the marsh west of Sertãozinho on 8, 21 and 22 October 1985; singing at the Santa Lucia marsh (21°40′S, 48°01′W) of the Fazenda dos Alpes on 12 November 1988 and at the Boca do rio das Pedras on 13 September 1987. E. Dente (pers. comm.) registered it near Pederneiras. Records few.

HELMETED WOODPECKER *Dryocopus galeatus*

A female low on trunks of tall second growth at 800 m on the rio do Carmo road (24°17′S, 48°25′W) at Intervales on 12 February 1987, pecked at a few sites and readily fled. C. Yamashita (pers. comm.) encountered another in similar habitat at Carlos Botelho State Park. Few recent records, but easily overlooked as shy and in understory.

FORK-TAILED PYGMY-TYRANT *Hemitriccus furcatus*

Calls a loud *tee-tee-teet* trill, like others of the genus, early in the morning by the last tall forest area along the coastal road between Rio de Janeiro and Santos, Rio Quiririm (km 23) (23°20′S, 44°56′W). T. A. Parker III registered it at Fazenda Capricórnio and elsewhere near Ubatuba (D. F. Stotz pers. comm.)

MASKED WATER-TYRANT *Fluvicola nengeta*

As noted by Willis (1992), I. Sazima photographed the first pair for the state sleeping together in mangroves of Ilhabela on 1 October 1980; specimen by Alvarenga (1990); spreading to many open ponds in the northeastern part of the state during the last ten years, due probably to forest destruction.

OLIVE-SIDED FLYCATCHER *Contopus borealis*

Willis *et al.* (1993) register several birds. First record at Boracéia by D. W. Snow.

WHITE-BANDED MOCKINGBIRD *Mimus triurus*

J. Vielliard and J.-D. Lebreton registered the first bird for the state at Marujá (25°12′S, 47°59′W); this and later records, all winter birds along the coast, noted by Argel-de-Oliveira (1987) and Willis & Vielliard (1989).

WHITE-STRIPED WARBLER *Basileuterus leucophrys*

We found it regular in gallery woodlands at São Carlos and on the *campos* of Itirapina, atop the sandstone *chapada* or mesa of São Carlos, an isolated *cerrado* zone in central São Paulo; also northward in similar swamps, where it is easily overlooked except for its loud vocalizations.

SCARLET-HEADED BLACKBIRD *Amblyramphus holosericeus*

F. F. Ferrari (pers. comm.) saw the first Scarlet-headed Blackbirds in 1984 on the Paranapanema river, and Willis registered others in marshes of the lower Aguapeí (Tupi Paulista bridge, 21°13′S, 51°30′W; also Fazenda Promissão) on 29–30 April 1984. We do not know if it nests or only appears in winter.

BLACK-FACED TANAGER *Schistochlamys melanopis*

Willis recorded one in edges of *cerradão* of the Fazenda dos Alpes, Santa Lúcia, on 30 December 1988. Few records northward, mostly over 50 years ago.

Disappearing species

LESSER NOTHURA *Nothura minor*

A bird of frequently cleared *campo* and *campo cerrado* habitats, recently only at Itirapina where not registered since the company that owned its habitat ploughed the centre of the zone in 1988. Emas National Park in Goiás is the only place we know where *N. minor* is protected.

DWARF TINAMOU *Taoniscus nanus*

A *campo* bird not recorded recently.

BAY-WINGED HAWK *Parabuteo unicinctus*

Although a bird of dry woodlands, it depends on group nesting and probably chases chickens. It is unrecorded from the state since collected in the 1800s in the heavily populated Paraíba Valley.

RED-THROATED CARACARA *Daptrius americanus*

A forest-interior bird (Thiollay 1991) that vanished with forest clearing in central and western São Paulo in the last 50 years.

BARE-FACED CURASSOW *Crax fasciolata*

Rare in the northwest, seen recently only at Paulo de Faria and at Nova Independência. Hunted in the few gallery woods left in the state, though common in the Pantanal.

RED-AND-GREEN MACAW *Ara chloroptera*

A pair flew across the Paranapanema River to the state of Paraná at Teodoro Sampaio, 12 July 1989 (Willis). Forest guards see occasional birds, but report that nestlings at the edge of the new reservoir were robbed by bird fanciers. Once regular far to the east, now almost gone.

BLUE-AND-YELLOW MACAW *Ara ararauna*

A pair in palms on the now flooded 'mini-pantanal' of Fazenda Aracanguá on 24 April 1984 (Willis). Guards report it at Teodoro Sampaio. Almost gone, mostly wanderers from the west.

FLAME-CAPPED PARAKEET *Aratinga auricapilla*

Still locally numerous at Mata Chita, the Pedregulho canyon or *furna*, and other vanishing northern dry woodlands; only protected at the Paulo de Faria reserve, where cattle and hunters are a problem.

Amazona parrots

A. xanthops of badly destroyed western open zones is not recorded recently; it survives mainly in Emas National Park in Goiás. *A. aestiva*, though the most popular cage-bird species, survives in Teodoro Sampaio and other areas in reduced numbers. *A. brasiliensis* of the Ilha Comprida region has been almost exterminated in the last few years by beach-house roads that give cage-bird traders access, though a few are protected at nearby Ilha do Cardoso Park. Other species in the state seem protected by reserves, though subject to illegal capture.

BLUE-EYED GROUND-DOVE *Columbina cyanopis*

A bird of open western zones, not recorded since early this century.

PURPLE-WINGED GROUND-DOVE *Claravis godefrida*

Said to follow bamboo seedings in eastern forests, now rare events because only bamboos that live on steep slopes survive. T. A. Parker III recently found one near Ubatuba (D. F. Stotz pers. comm.).

WHITE-WINGED NIGHTJAR *Caprimulgus candicans*

A bird of the disappearing *campos*, not registered since Natterer.

THREE-TOED JACAMAR *Jacamaralcyon tridactyla*

We do not know why this bird disappeared, perhaps because clearing in the last 50 years has left hardly any large forest tracts across the centre of the state. Recorded at several interior localities before the clearing 'binge'.

WHITE-BEARDED ANTSHRIKE *Biatas nigropectus*

Pairs live in bamboo at Intervales, following flocks of similarly coloured *Philydor fuscus* in the understory whenever possible; mimicry probable (Willis 1989). Not seen elsewhere, perhaps disappearing.

SOUTHERN BRISTLE-TYRANT *Phylloscartes eximius*

Another frequent bird of understory flocks in western forests until 50 years ago, which we encountered only in Paraná State (mainly Iguaçu National Park) in 1975.

RUFOUS-SIDED PYGMY-TYRANT *Euscarthmus rufomarginatus*

A bird of western semi-open zones, not recorded since 1821 (Pelzeln 1869). Survives in Mato Grosso (Willis & Oniki 1990).

CREAM-BELLIED GNATCATCHER *Polioptila lactea*

Another forest bird of the interior, known to stay in treetop flocks; not registered since one pair in 1905 (Pinto 1944).

OCHRE-BREASTED PIPIT *Anthus nattereri*

Like *Nothura minor*, a rare bird of interior savannas, registered on the *campos* of Itirapina until 1988 and on those of Aguas de Santa Bárbara (22°46′S, 49°15′W) earlier. Seems to like swampy sites and lagoons, especially where recently burned. With reduction of natural open habitats, the chance that birds will find recently burned sites near swampy ones drops to near zero.

COAL-CRESTED FINCH *Charitospiza eucosma*

Likes burned zones in open *cerrado*, recently only at the isolated Broa *cerrado* (22°10′S, 47°52′W) and nearby; protected in Emas National Park but not in any numbers elsewhere.

Sporophila spp.

'Caboclinhos' of the *S. bouvreuil* group disappear, as explained above, because of loss of natural *campos* to stop at on migration as they cross the forest belt in Paraná and São Paulo and because they are subject to heavy capture for the cage-bird trade.

Sporophila frontalis and *S. falcirostris* are apparently rare, due to cage-bird fanciers and rarity of seeding of eastern bamboos, their main foods. Recently recorded near Ubatuba (T. A. Parker III), while Willis has seen a few *S. frontalis* in Carlos Botelho and Itatiaia (en route to Pico dos Três Estados but in Minas Gerais); this species said to be captured in small numbers at rice fields in the Ribeira Valley and to nest on protected Ilha do Cardoso (P. Martuscelli, fide D. F. Stotz).

GREATER LARGE-BILLED SEED FINCH *Oryzoborus maximiliani*

The object of hundreds of dollars in the cage-bird trade, and a species of swampy borders of local natural *campos*, this is a bird that has an almost 100% chance of being caught in populous São Paulo. We have not seen it. *Oryzoborus angolensis*, its smaller and more cluttered-habitat relative, is a thousand-dollar bird for cage-bird song competitions (Sick 1985), picturesque affairs that are incredibly efficient at eliminating a formerly-common species except in occasional places we are not going to tell anybody about.

Discussion

Disappearance

Species disappearing from São Paulo state are mostly birds of inland open habitats, birds of inland dry-forest zones (99% destroyed), bamboo species, and popular cage-birds. The disappearance of birds of open or semi-open natural habitats needs attention, for most people seem surprised that certain species of these zones do not adapt to pastures and fields. The 2 million square kilometers of Brazilian *cerrado* are the fastest disappearing habitat in the world, mainly for big ranches that do not resettle poor people. Our discussion of this at the 1990 International Ecological Congress in Yokohama attracted woefully little attention. Specifically, Itirapina, Itapetininga, Aguas de Santa Bárbara, and similar *campo/cerrado* areas need better protection and use of planned burning.

Reservoirs on every possible inch of rivers eliminate other species. We hope the little Aguapeí, Mogi-Guaçu and Sapucaí Rivers will not be next, and propose protected status, perhaps environmental protection areas and local reserves.

Certain mixed-flock or other birds of inland forests seem nearly gone, worse off than Atlantic coastal species that attract attention. Some of the northern inland dry forests, such as Mata Chita, the Pedregulho Canyon, and Fazenda dos Alpes, deserve protection; cattle could be removed from Paulo de Faria Reserve.

Coastal species with problems are mostly affected by affluent beach-house developments. We especially recommend park status for the north-eastern 5 km of Ilha Comprida, subject to occasional storm wash and better for shorebirds than for houses, plus the southwestern 10 km as the best *restinga* forest, home of *Amazona brasiliensis* and a new species of flycatcher (Willis & Oniki 1992), and 40 km from the proposed bridge anyway. T. Sigrist (pers. comm.) found truckloads of forest cutters busy in the centre of the island in January 1992 at the mere rumour of impending reserve status.

Disappearing bamboo specialists probably have to wait too long between bamboo seed crops, since bamboo species that should fill the gaps were in flat housing or agricultural zones inland or coastally. Several species are hit hard by the affluent cage-bird trade, which should be banned or concentrate on abundant *Sporophila caerulescens*. The other seedeaters and parrots sing too well or are too pretty for their own good.

New species

New species are mostly birds of bushy pastures, often from dryer zones to the north and west. Some were present all along—migrant seedeaters, northern upland and *buriti* species that barely reach the state, the mountaintop *O. moreirae*, certain river-edge birds of the west. We are not certain if migrant *Catharus fuscescens* and *Contopus borealis* were here all along or if they have increased with clearings, possible lower numbers of resident competitors, or some other factor.

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Taxonomy of the blue-crested group of *Cyanocitta stelleri* (Steller's Jay) with a description of a new subspecies

by M. Ralph Browning

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Populations of *Cyanocitta stelleri* (Steller's Jay) that breed from Alaska to northern Mexico, as far south as Jalisco in western Mexico, and one population (*azteca*) in central Mexico, are black-crested. Blue-crested populations surrounding *C. s. azteca* breed in the mountains from southern San Luis Potosí, Guanajuato and Michoacán (Fig. 1) south to Honduras and Nicaragua. Blue- and black-crested (*azteca*) populations intergrade only in Michoacán and western Veracruz.

Blake (*in* Blake & Vaurie 1962) recognized five subspecies in the blue-crested group: *coronata* Swainson, 1827, from Guanajuato, San Luis Potosí, Hidalgo, northern Veracruz, and "(?)" Oaxaca; *purpurea* Aldrich, 1944, from Michoacán; *teotepecensis* Moore, 1955, from Guerrero; *ridgwayi* Miller and Griscom, 1925, from Chiapas to western Guatemala, El Salvador, and "(?)" Honduras; and *suavis* Miller and Griscom, 1925, from Nicaragua. An additional name, *C. s. restricta*, was proposed by Phillips (1966) for the populations from Oaxaca. Phillips (1986) later recognized only four subspecies in the blue-crested group. He synonymized *ridgwayi* and *teotepecensis* with *coronata*. Although Phillips (1986: 45) recognized *restricta*, he concluded that its status was "problematical" because "Hidalgo birds (El Chico) . . . appear indistinguishable from Oaxaca specimens." Phillips (*in litt.*) later stated that the birds from Hidalgo "might be viewed as [the] Veracruz race [=*coronata*] somewhat paled by *diademata*" Bonaparte, 1857, a black-crested subspecies from northern Mexico, Arizona, and New Mexico. Binford (1989) synonymized *restricta* with *coronata*, but recognized *teotepecensis*.

The extent of geographic variation in the blue-crested group of *C. stelleri* (see Brown 1963) suggests that there are more subspecies than accepted by Phillips (1986). Because of this, I reevaluate the taxonomic status of the blue-crested populations. I also restrict the type locality of *coronata*.

Methods

I examined 207 blue-crested and 32 black-crested specimens of adult *C. stelleri* from Mexico south to El Salvador and Nicaragua. Birds in similar plumages were compared for variation in the intensity of blue (pale or dark) and the amount of purple on the back, undersides, and crest. The white to pale blue streaks on the front of the crest were compared for variation in colour and approximate number. I measured the wing chord and the length of the crest from the base of the exposed culmen to the tip of the longest crest feather (Tables 1 and 2). I did not measure the length of the supraloral spot and the frontal streaks on the crest as did Brown (1962). The length of the spot is subject to variation caused by differences in specimen preparation, and the beginning and ending of the streaks on the frontal crest are impossible to determine accurately. Measurements of other characters show essentially no geographic variation.

Results

Geographic variation in the blue-crested populations is most pronounced in the colour of the back and colour and length of the crest. One population of blue-crested birds and two of black-crested jays from Mexico have longer wings and crests (Tables 1 and 2) than other populations in this study. Differences between the colour of fresh and worn plumages of specimens from the same localities are slight. The few first-year birds I examined are less heavily barred with black on their wing coverts, have shorter wings, and are usually paler blue, especially below, than adults from the same populations. The taxonomic status of *C. s. coronata* and the subspecific characters of subspecies follow.

The type of locality and taxonomic status of C. s. coronata

Swainson (1827a: 437) described *coronata* as "crested, blue, sides of head blackish; chin, front, and eye-brow whitish, wing coverts and tertials banded with black lines; tail rounded." The holotype of *coronata* is lost and Swainson's ambiguous description could apply to almost any population of *C. stelleri*, but authors as early as Jardine & Selby (1828–1830) and Bonaparte (1837) regarded the description of *coronata* as referring to a blue-crested bird. The range of *coronata* was stated by Ridgway (1873: 42) as "Vera Cruz to Honduras."

The type locality of *coronata* has been subject to controversy. Swainson (1827a) wrote that *coronata* "occurs in various parts of the Table land." The source for the specimens he reported was William Bullock, Sr., who had travelled in the states of Veracruz, Puebla and México in 1822. Ridgway (1904), followed by Hellmayr (1934), gave the type locality of *coronata* as "table lands of Mexico." Brodkorb (1944: 403) restricted the type locality of *coronata* to Real del Monte in southern Hidalgo, "a well known Bullockian locality." Davis (1945), remarking that Bullock (Sr.) did not travel in Hidalgo, restricted the type locality of *coronata* to Cofre de Perote in northwestern Veracruz. Moore (1954) stated that specimens from Real del Monte and Cofre de Perote are similar, and Miller *et al.* (1957) listed both places and did not indicate which they considered was the type locality. Phillips (1966) followed Brodkorb (1944), but later (Phillips 1986: 45) stated, without providing reasons, that the type locality of *coronata* is "probably" Cofre de Perote and that it "seems unlikely" that it is Real del Monte.

Swainson did acquire specimens from Real del Monte from William Bullock, Jr. (Swainson 1827b), who visited there and collected birds elsewhere in the table lands and in Oaxaca (Stresemann 1954). Swainson also acquired specimens from Real del Monte from John Taylor (see Browning [1989] on details of Swainson's sources of specimens from Mexico), but Swainson never associated *coronata* with that locality. However, Jardine & Selby's (1828–1830: pl. 64 and accompanying text) illustration and description of a specimen "sent by Mr. William Bullock from the table land of Mexico" are of a bird that is darker and more purple dorsally than are specimens from Real del Monte.

The only locality for which Bullock Sr. (1824) mentioned collecting jays was near Rio Frio, Puebla, but specimens from there are black-crested (Brodkorb 1944) and are referred to *azteca* Ridgway, 1899, of central Mexico. Bullock Sr. collected birds at the village of Perote, Veracruz, where he first referred to being in the table lands. Davis's (1945) specimens of *C. stelleri* from nearby Cofre de Perote are intergrades between black-crested and blue-crested populations.

The only locality Bullock Sr. actually visited that has a dark purplish-backed population of pure blue-crested *C. stelleri* is Las Vigas, Veracruz. Bullock passed through Las Vigas, spending the night in Perote. It is likely he there prepared the specimens he collected that day, labelling them all as from the "Table Land." I conclude that the type locality of *C. s. coronata* is best considered Las Vigas, Veracruz, and I hereby so restrict it.

The subspecies *coronata* is paler blue than *purpurea* Aldrich, 1944, a dark and extensively purple subspecies from Michoacán, and *teotepecensis* from Guerrero, and is darker blue below and more purple on the back and especially the crest than other subspecies. Specimens from Cerro Conejo, San Luis Potosí, bear no resemblance (*contra* Lowery & Newman (1951) to *teotepecensis*. The markings on the front of the crest and the crown in *coronata* are noticeably paler blue and the crown and back are more purple than in *ridgwayi* from Chiapas, Mexico and Guatemala, and *restricta* from Oaxaca. The undersides in *coronata* are darker blue and the back is darker and more purple than in *restricta*, the crest is longer than in *ridgwayi* and orter than in *teotepecensis* (Tables 1 and 2). Specimens of *coronata* are slightly more purplish-blue on the crest and back than the 2 specimens I examined of *lazula*, a more purely blue subspecies from El Salvador.

I conclude that the range of *coronata* (number of specimens examined in parentheses) includes only northern Veracruz (7), probably northern Puebla (0), and Cerro Conejo region in southeastern San Luis Potosí (11). Intergradation between *coronata* and *azteca* occurs at La Puerta (Moore 1954), Mirador (2), Orizaba (1), and Cofre de Perote (2) in Veracruz.

Birds from southern Hidalgo are not intermediate between *coronata* and the greyish-backed and black-crested subspecies *diademata* (*contra* Phillips 1986). Specimens from Real del Monte, Hidalgo, are slightly paler on the back than *coronata* from Veracruz, and birds from nearby El Chico, Hidalgo, are still paler and are less purple dorsally than those from Real del Monte. I conclude that specimens from southern Hidalgo are similar to *coronata* but tend toward paler specimens from northern Hidalgo, Guanajuato, and Cañada Grande in southwestern San Luis Potosí. Pale specimens from Xichú, Guanajuato, reported by Moore (1954), and from Cañada Grande, San Luis Potosí, by Phillips (1986), were identified by those authors as *coronata*. However, the pale northern population is distinguishable from the adjacent subspecies *coronata* and from the geographically disjunct subspecies *restricta*. The northern blue-crested population is here named

Cyanocitta stelleri phillipsi, subsp. nov.

Holotype. LSUMZ 15483, adult male, Cañada Grande (7 miles SE by road), San Luis Potosí, Mexico. Elevation 7400 feet. Collected 8 May 1950 by Robert J. Newman, original number 1880.

Diagnosis. Similar to *coronata* in size but noticeably paler and duller blue above and below; almost lacks purple colour on the back, crest, and upper breast; pale markings on the front crest appear to extend farther distally. Darker blue above and below and less purple than *restricta*. The contrast between the colours of the back and crest is greater in *phillipsi* than in the other blue-crested subspecies. Compared to *diademata*: crest blue (not black); overall bluish (less greenish) plumage; shorter wings and crest.

Measurements of the holotype (mm). Wing chord 145.7, tail 139.8, crest length 57.5.

Distribution. Cañada Grande, San Luis Potosí (6 specimens), Xichu, Guanajuato (4), and Encarnación, Hidalgo (1). Specimens from El Chico (2) and Real del Monte (2), Hidalgo, are *phillipsi* > *coronata*.

Etymology. Named for Allan R. Phillips, in recognition of his numerous contributions on the taxonomy and distribution of birds from North and Middle America.

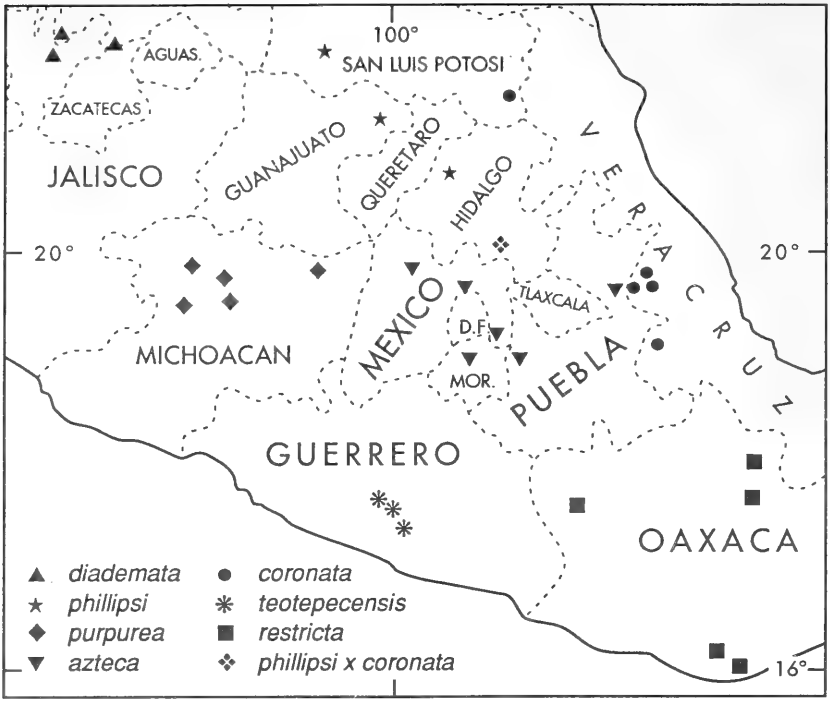

Figure 1. Localities of specimens examined of *Cyanocitta stelleri* from central Mexico.

Remarks. The specimen from Encarnación was collected in October; all other adult specimens of *phillipsi* were collected in April and May. One first-year bird from Cañada Grande is slightly pale but otherwise resembles the adults from the same locality. A first-year female collected at El Lobo, Querétaro, at 5400 feet, in January, is darker blue than a first-year bird from Cañada Grande. The specimen from Querétaro resembles a first-year bird from Veracruz but it is deeper blue, especially below.

Other recognized subspecies

In addition to *coronata* and *phillipsi*, I recognize six subspecies in the blue-crested group of *C. stelleri* (Fig. 1). The ranges (specimens examined in parentheses) and subspecific characters of these and the two black-crested subspecies from Mexico are as follows:

C. s. ridgwayi. This subspecies differs from *coronata* as previously characterized. It is similar to *restricta* in the amount of white on the throat, but *ridgwayi* differs in its darker blue plumage and bluer (less whitish) crest streaks. Resident in Chiapas (24) and Guatemala (56).

The name *galeata* Cabanis, 1851, synonymized by Ridgway (1899, 1904) with *coronata*, was based on a specimen with the locality "St Fe' de

TABLE 1
Wing chord and length of crest in adult male *Cyanocitta stelleri*

Subspecies	Wing chord range	Wing chord mean, s.d.	*n*	Crest length range	Crest length mean, s.d.	*n*
azteca	147.5–152.3	149.5	6	65.6–71.6	68.8	6
diademata	140.4–150.9	146.0	5	62.4–72.1	65.9	6
phillipsi	139.9–145.7	142.7	6	57.5–63.3	60.3	6
coronata	137.8–148.2	144.2, 3.14	10	58.6–66.1	61.1, 3.10	9
restricta	137.0–150.4	142.6, 4.43	10	57.4–67.2	62.6, 3.68	11
purpurea	145.2–155.3	149.2	5	60.2–74.9	69.9	6
teotepecensis	137.0–150.4	142.6, 4.43	10	61.3–73.8	67.4, 4.07	11
ridgwayi:						
Chiapas	135.4–151.1	145.8, 4.07	15	49.0–62.2	56.2, 3.71	15
Guatemala	136.3–148.0	142.7, 3.92	11	52.7–64.1	57.5, 3.60	11
suavis	137.0–151.6	143.1, 3.77	13	53.8–66.6	57.9, 2.22	12
lazula	150.4		1	58.2		1

TABLE 2
Wing chord and length of crest in adult female *Cyanocitta stelleri*

Subspecies	Wing chord range	Wing chord mean, s.d.	*n*	Crest length range	Crest length mean, s.d.	*n*
azteca	144.2–152.0	147.9	4	63.0–69.9	66.4	5
diademata	138.3–143.7	141.1	6	62.3–66.8	65.9	6
phillipsi	135.5–142.8	139.5	4	56.8–64.2	61.5	4
coronata	137.9–148.0	142.5, 2.96	9	58.2–64.4	60.9, 2.40	9
restricta	135.6–144.5	139.2	3	51.4–63.1	57.1	3
purpurea	133.0–141.6	138.7	5	61.2–69.0	65.7	5
teotepecensis	134.4–146.7	140.6, 4.50	9	59.2–68.0	62.4, 2.98	9
ridgwayi:						
Chiapas	137.7–145.2	141.6, 2.58	9	51.9–57.8	54.3, 1.94	9
Guatemala	135.7–145.2	140.3	7	51.3–57.9	54.3	7
suavis	136.2–149.9	144.1	5	55.7–59.0	57.3	5
lazula	137.2		1	58.3		1

Bogata.?" Two specimens (4697, male and 4698, female ?) in the Museum Heineanum are identified as *Cyanocitta galeata*, one of which is the holotype (B. Nicolai, *in litt.*). Nicolai characterized the two specimens as having a shorter crest than *coronata* and plumage colour as *ridgwayi*. The name *galeata* is a *nomen oblitum*.

C. s. suavis. This subspecies differs from *ridgwayi* by its paler blue plumage, with a greater contrast in colour between the back and crest, and less white on the chin. Resident in Nicaragua (15) and Honduras (9). I agree with Monroe (1968) that birds from Honduras do not intergrade (*contra* Blake *in* Blake & Vaurie 1962) with *ridgwayi*.

C. s. lazula. The two specimens examined are darker and more purely blue than specimens of *suavis* or *ridgwayi*. Resident in El Salvador (2). Tashian (1953) stated that *lazula* did not appear separable from *ridgwayi*, and Blake (*in* Blake & Vaurie 1962) and Monroe (1968) synonymized *lazula* with *ridgwayi*. Others (e.g. Dickey & van Rossem 1938, Rand & Traylor 1954, Phillips 1986) recognized *lazula* as a distinct subspecies. I tentatively recognize *lazula*.

C. s. purpurea. This subspecies is much darker and more extensively purple on the crest, back and upper breast than the other blue-crested subspecies. The crest streaks are less bluish in *purpurea* than in *teotepecensis*. It is similar to *azteca* in wing chord and in the length of the crest (Tables 1 and 2). Resident in western and central Michoacán (15). Intergrades with black-crested *azteca* in north-central Michoacán (Blake & Hanson (1942).

C. s. teotepecensis. Specimens of *teotepecensis* are paler blue and less dark purple than in *purpurea*. Birds from Guerrero differ from *restricta* by their darker colouration, less white on the chin, and longer and less heavily marked crests. Resident in central and southern Guerrero (23).

C. s. restricta. This subspecies differs from *coronata* and *phillipsi* as previously characterized. *Cyanocitta s. restricta* differs from *teotepecensis* in being paler blue below and in the more extensive and paler blue markings on the front of the crest. The crest is shorter than in *teotepecensis* and longer than in *ridgwayi* (Tables 1 and 2). The more extensive white on the chin resembles that in *ridgwayi*. Resident in Oaxaca (28). Morphological differences between specimens from Oaxaca and other populations were reported by several authors (e.g. Hellmayr 1935, Brown 1962) before Phillips (1966) proposed the name *restricta*.

C. s. azteca. This black-crested subspecies is purplish-blue dorsally. Resident in the states of México (9), Distrito Federal (9), Morelos (2), Puebla (2), and west-central Veracruz (5).

C. s. diademata. This black-crested subspecies is greyish dorsally. From southeastern Sonora (2) and extreme southwestern Chihuahua (6) to Durango (1), Jalisco (2), Zacatecas (2), and Cerro Potosí, Nuevo León.

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First record of the Blue Crowned Pigeon *Goura cristata* on Seram

by Andrew C. Kitchener, Alastair A. Macdonald & Philip Howard

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Three species of crowned pigeons, *Goura* spp., are found throughout New Guinea and some neighbouring islands (Goodwin 1970, Coates 1985, Beehler *et al.* 1986, Howard & Moore 1991). The most westerly record of the Blue Crowned Pigeon *Goura cristata* is from the island of Misool (just to the west of the Vogelkop Peninsula of New Guinea), but it has also been erroneously recorded from Timor (White & Bruce 1986).

On 25 August 1991 a Blue Crowned Pigeon, destined for the cooking pot, was obtained from the villagers of Melinani, a few kilometres inland from the town of Wahai (2°48′S, 129°35′E) on the northern coast of Seram, central Moluccas. The bird was one of two that had been captured while feeding in a hollow, rotten tree stump in lowland tropical forest inland from the village of Wasa (approximately 15 km south of Wahai). The second bird later escaped from captivity. The remaining bird had been captive for about one week, but had only been fed sugar water so that it was emaciated and weighed only 1.35 kg. It was in moult, which may explain the ease with which it was captured and the discrepancy in wing-lengths. Measurements from the skin are as follows: wing-length, 330 mm (left)/316 mm (right), tail-length 247 mm, tarsus-length 82 mm, bill-length 34.5 mm. The skin is in the collections of the National Museums of Scotland (reg. no. NMSZ 1992.006). On the basis of wing measurements it is most similar in size to a male from Misool Island, which is nearest geographically (Table 1). However, because the specimen from Seram was in moult, its wing feathers may not be fully grown. It was not possible to sex this specimen, because the carcase was eaten. The villagers describe the Blue Crowned Pigeon as being abundant in lowland forests, but rarely caught because although it lives on the ground it is easily alarmed and flies up into the trees for safety. It was only because the birds were feeding inside a tree stump that it was possible to approach and capture them. The villagers call the bird *Mambruk*, which is not a universal name for pigeons, because, for example, the White-eyed Imperial Pigeon *Ducula perspicillata* is called *Pombo*.

We did not observe any Blue Crowned Pigeons in lowland or alluvial tropical forest during the three days that we were travelling through this habitat. Unfortunately, we were not made aware of the possible presence of this species until the end of our stay on Seram. It is possible that it could have been imported to Seram, although a number of factors suggest that this is not so. Firstly, local people have a unique local name for this bird, which suggests that it is a familiar species in the local avifauna. Secondly, they volunteered information as to its habits and habitat which conforms to what is recorded in the literature (e.g. Goodwin 1970, Beehler *et al.* 1986). Thirdly, Wahai is an active centre for the export of birds, especially

TABLE 1
Wing measurements of Blue Crowned Pigeons *Goura cristata minor* from Waigeu, Misool and Seram (after Ripley 1964, Mees 1965, P. Colston pers. comm.)

	Sex	Wing-length (mm)
Seram	male?	316/330*
Misool	males	325–335
Misool	females	312–324
Waigeu	males	350–365
Waigeu	females	333–353

*Specimen in moult; wing feathers may not be fully grown.

lories (*Eos bornea*, *E. semilarvata*), lorikeets (*Trichoglossus haematodus*) and cockatoos (*Cacatua moluccensis*), to the neighbouring island of Ambon and, thence, to Jakarta. No wild birds were recorded on the boat coming to Seram from Ambon, but more than a hundred wild birds were recorded travelling back to Ambon. Between 5,000 and 15,000 birds are exported annually by one trader in Wahai, all of which are sent to Ambon. It seems very unlikely that wild birds would be imported from New Guinea via Ambon to be sold for food, when the local avifauna represents an abundant and free source of protein and can be sold for money to buy essentials such as salt. In addition, the people of Melinani are not sufficiently wealthy to indulge themselves in the purchase of exotic birds as pets or meals.

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Geographic forms of the Regent Parrot *Polytelis anthopeplus* (Lear), and their type localities

by Richard Schodde

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The Australian Regent Parrot *Polytelis anthopeplus* occurs in two widely disjunct populations: one through the wheat-belt of southwestern Australia and the other in mallee and eucalypt woodlands along the central Murray River in inland southeastern Australia. The western isolate is moderately widespread and abundant (Serventy & Whittell 1976), but the more brilliantly plumaged population in the east has become reduced to such fragmented enclaves that it is now gazetted as rare and threatened (Burbidge 1985). Although Peters (1937) and Forshaw (1969) did not accept any forms, Condon (1951, 1975), Lendon (1973) and Forshaw (1978, 1981, 1989) agreed that the eastern enclave averaged brighter yellow than the western; so they distinguished them subspecifically. None of the reviews, however, were supported by morphological analyses in detail.

Here 34 adult plumaged males and 17 females of the eastern population in the Australian Museum, Sydney (AM), Australian National Wildlife Collection, CSIRO, Canberra (ANWC), Museum of Victoria, Melbourne (NMV), South Australian Museum, Adelaide (SAMA) and Western Australian Museum, Perth (WAM) have been compared with 8 males and 10 females of the western group. Eastern males are a brilliant mustard yellow over the head and ventral surface, dulling to mid olive on the mantle; western males are a more muted olivine yellow ventrally, and are deep, almost dusky-olive on the mantle, the dark cast from which washes up over the head. There is some variation in depth of tone within populations, particularly on the mantle, and in a reddish wash around the vent. One additional western male, WAM7379 from an anonymous source with unspecified locality, equalled eastern males in brightness of ventral yellow, *cf.* anecdotal field observations by Forshaw (1981). With an unworn bill (culmen from cere 20.5 mm), it may well have been a caged bird transported from eastern states; it is excluded from the table of measurements (Table 1). Differences between females parallel those between males to a lesser extent, eastern females being mid olive-yellow over the face and ventral surface, approaching western males in tone. Western females average slightly duller and more greenish olive, with an often smaller patch of citrine on the lesser wing coverts ('shoulders'). Broad sulphur edging to the inner margins of the remiges appears to reflect juvenility, but may be less marked in eastern than western populations. Overall, the contrast in colouring between the sexes is greater in eastern than western populations.

Indexed by length of wing and bill, eastern males average slightly and significantly larger than those in the west (Table 1). Comparisons in length of tail are untrustworthy because of wear. Western males also differ less from females in size (Table 1), in parallel with lessened

TABLE 1

Mean measurements (mm), with one standard deviation, of eastern and western Australian series of the Regent Parrot *Polytelis anthopeplus* in Australian museum collections, and the significance of their differences by *t*-test at the 5% level of probability. *Indicates $P<0.05>0.1$; NS indicates $P>0.05$ (not significant)

Population	*n*	Wing (flattened chord)	Tail	Culmen (from cere)
Eastern ♂♂	34	200.9, 5.8	223.5, 8.0	18.4, 0.9
Western ♂♂	8	194.3, 5.6	223.0, 9.1	17.1, 0.6
t		2.58 (*)	0.02 (NS)	2.42 (*)
Eastern ♀♀	17	195.9, 5.7	205.9, 8.3	18.4, 1.0
Western ♀♀	10	194.5, 4.5	198.0, 7.3	17.4, 0.7
t		0.73 (NS)	2.50 (*)	2.01 (NS)

dimorphism in their plumage. Such differentiation in both colour and size reflects allopatric divergence. Eastern and western populations have been separated from one another by alien habitat for at least 25,000 years since the onset of the last dry glacial epoch, and probably for considerably longer (*cf.* Bowler 1982, Bowler & Wasson 1983).

Three names are available for the two subspecies: *Palaeornis anthopeplus* Lear, 1831, *Palaeornis melanura* Lear, 1832 and *Polytelis anthopeplus westralis* Mathews, 1915. Both of Lear's names, based on a female and adult male respectively, were published on plates in his *Illustrations of the Family of Psittacidae, or Parrots,* 1830–1832, without description or indication of their Australian source. Since Mathews' (1912) first subspecific list of Australian birds in 1913, they have been presumed to apply to the eastern population and given the type locality of New South Wales (e.g. Peters 1937, Condon 1975). *P. a. westralis* Mathews, type locality southwest Australia, is based on the western form. Lear's (1830–2) superb figures of *Palaeornis anthopeplus* and *P. melanura*, nevertheless, also match the western form. The male (*melanura*) on plate 28 approaches it most closely, the dusky olive of its mantle washing up on to the crown and over the face. The female (*anthopeplus*) on plate 29 is dull as well, with a mid greenish wash around the neck, similar to the figure of a syntype of *Polytelis anthopeplus westralis* Mathews on plate 296 in Mathews (1916–7).

Historical circumstances are coincident. The only specimens of the eastern form taken before the publication of Lear's names were collected by Charles Sturt on his epic exploration of the Murray River in early 1830. The two skins that he preserved out of the dozen or so shot (Sturt 1834, pl. opp. p. 191) were sent directly to the University Museum at Edinburgh, Scotland, where Lear could hardly have seen them; one, a female, is still extant (Stenhouse 1930).

Southwestern Australia instead is the likely provenance of the Regent Parrots that Lear figured in 1831 and 1832. Lear drew the subjects for his folio from specimens shipped alive from colonial outposts to the menageries of the Zoological Society of London, Lord Stanley and N. A. Vigors, and as skins to the collection of the Zoological Society or London dealers such as B. and J. Leadbeater (Hyman 1980: 20–22, Tree 1991:38). In southwestern Australia, Regent Parrots range south on the west coast to beyond the Swan River, which was settled from 1829, and west on the south coast towards King George Sound (Albany), which was garrisoned in 1826. That Lear had parrots and cockatoos available from Albany, at least, for this folio is clear from his figures of *Calyptorhynchus baudinii* Lear, and probably *Platycercus stanleyii* Vigors = *P. icterotis icterotis* (Kuhl), *Platycercus pileatus* Vigors = *Purpureicephalus spurius* (Kuhl) and *Platycercus baueri* Lear = *Barnardius zonarius semitorquatus* (Quoy and Gaimard) (Lear 1830–32). Perhaps significantly, Lear's plates of both *Calyptorhynchus baudinii* and *Palaeornis melanura* are annotated with the same English source: "in the possession of Mr Leadbeater". Some parrots and cockatoos illustrated by Lear are found in the eastern range of the Regent Parrot; but these species—*Cacatua leadbeateri leadbeateri* and *Barnardius zonarius barnardi*—extend much further east. Along with Lear's *Palaeornis rosaceus* = *Polytelis swainsonii* (Desmarest, 1826), they were probably trapped by local expeditions and colonists out from the newly established settlements along the Macquarie River, New South Wales, in the 1820s.

Unfortunately, the name-bearing types (here holotypes) of *anthopeplus* Lear and *melanura* Lear are almost certainly lost. Neither is cited as having passed to the British Museum (Natural History) by Sharpe (1906: 514–5), Salvadori (1891: 480) or Warren (1966). To avert further arbitrary or argumentative association of the names *anthopeplus* and *melanura* with the eastern form, a single neotype is designated here for both names upon the recommendation of the Taxonomic Advisory Committee of the Royal Australasian Ornithologists Union. It is WAM A7095, a female from Bolgart, *c.* 40 km north of Toodyay, southwestern Australia. By this action, *Palaeornis melanura* Lear becomes a junior objective synonym of *P. anthopeplus* Lear. The eastern form, in turn, lacks a name which is provided herewith:

Polytelis anthopeplus monarchoides subsp. nov.

Holotype. ANWC 42432, male adult, leg. R. Schodde at Kingston, 12 km west of Barmera, South Australia, 6 November 1989.

Paratypes. AM 0.17892 male, ANWC 42433 male, ANWC 14821 female, NMV B.18436 male, SAMA B.46511 male.

Diagnosis. Males brilliant mustard yellow ventrally, washing over face and head; mantle mid, rarely dark olive. Females mid olive-yellow over face and ventral surface with reduced greenish tint, citrine patch on lesser wing coverts ('shoulders') variably large. Size large, with sexual dimorphism in wing length: male wings 190–214 (mean 201) mm, female wings 187–210 (mean 196) mm.

Etymology. monarchoides, from the Greek "resembling a ruler or monarch", paraphrases the English name for this elegant parrot, the largest of its genus.

Distribution. Central Murray River and fringing mallee woodlands in inland southeast Australia, east to Balranald and Swan Hill (formerly Echuca), south to Wyperfeld and Jeparit (formerly southern Wimmera and Bordertown), west to Karoonda and Waikerie (formerly Keith, Murray Bridge and Mt Mary Plains), and north to Gluepot, Canopus, Pooncarie and Arumpo. Within these limits, distribution is patchy.

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Notes on some birds of northeastern Brazil (5)

by Dante Martins Teixeira, Roberto Otoch, Giovanini Luigi, Marcos A. Raposo & Antônio Cláudio C. de Almeida

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This report follows Teixeira *et al.* (1986, 1987, 1988, 1989), and records some of the results obtained by the Ornithological Section of Museu Nacional during the expeditions to northeastern Brazil of the last few years. Specimens in the collections of Museu Nacional (MN), United States National Museum (USNM) and British Museum Natural History (BMNH) are referred to by the initials plus the respective catalogue number. English names and the sequence of species follow Meyer de Schauensee (1970).

BROWN PELICAN *Pelecanus occidentalis*

The wide-ranging Brown Pelican has been recorded in coastal Amapá and from the Amazon mouth, and as a vagrant in the interior of Brazil in Roraima (Pinto 1978, Sick 1985). Except for the doubtful observation by Mitchell (1957), apparently there is no record of this bird further to the south. However, a single individual was observed by A. C. de Almeida on Mar Grande beach, near Itaparica island, Todos os Santos bay, Bahia (*c.* 13°00′S, 38°42′W), in December 1982.

TRICOLOURED HERON *Hydranassa tricolor*

Except for a vagrant observed by Oren (1984) on Fernando de Noronha, this species has been recorded only along the extreme northern Brazilian coast, from Amapá and the Amazon mouth south to Piauí (Pinto 1978, Sick 1985). On 6 May 1982, it was possible to observe an isolated individual on a lake near Quixadá, in the dry interior of central Ceará (*c.* 4°58′S, 39°01′W). This is an unusual record, as the Tricoloured Heron typically inhabits the coastal wetlands, especially mangroves.

CAPPED HERON *Pilherodius pileatus*

Widely distributed in Brazil, but not hitherto recorded from the extreme northeast (Pinto 1964, 1978). However, it is a common bird in the wetlands of Aiuaba, southern Ceará (*c.* 6°38′S, 40°07′W), where we observed several individuals in February 1990.

PLUMBEOUS IBIS *Harpiprion caerulescens*

Only known previously from Bolivia, Paraguay, Uruguay, Argentina and adjacent parts of Brazil (Rio Grande do Sul and Mato Grosso; Blake 1977, Pinto 1978). On 31 October 1989, R. Otoch recorded some vagrants on a dam near Iguatú, southern Ceará (*c.* 6°32′S, 39°18′W), side by side with the Buff-necked Ibis *Theristicus caudatus*, which is very common in the region.

SCARLET IBIS *Eudocimus ruber*

Except for a small population on the southeastern Brazilian coast, the Scarlet Ibis survives only in Amapá south to Maranhão, with scattered records from Piauí and Ceará attributed to vagrants (Teixeira & Best

1981, Teixeira *et al.* 1990). The species is, however, not uncommon in the mangroves at the mouth of Acaraú river, extreme northwestern coast of Ceará (*c.* 2°53′S, 40°07′W), but its status there is uncertain.

AMERICAN FLAMINGO *Phoenicopterus ruber*

According to some fishermen of coastal Ceará, forty years ago the American Flamingo was a common bird at the mouth of Acaraú river. Nowadays, this species is extinct in the northeast, and its range in Brazil seems to be reduced to the north coast of Amapá (Teixeira & Best 1981).

YELLOW-BILLED PINTAIL *Anas georgica*

In Brazil, this species occurs from Rio Grande do Sul north to São Paulo (Pinto 1978), and there is a single record from the Uraricoera river, Roraima (Shattuck, *in* Pinto 1966). However, a total of seven adult Yellow-billed Pintails were observed in Ceará by R. Otoch during April 1979 (Massapê, *c.* 3°31′S, 40°20′W), March 1980 (Jaguaribe, *c.* 5°53′S, 38°37′W) and May 1983 (Aracati, *c.* 4°34′S, 37°46′W).

BLUE-WINGED TEAL *Anas discors*

This northern migrant, locally recorded in Brazil (Pinto 1978, Sick 1985), seems to be rather common during the austral summer (November–December) in several lagoons and salt-ponds of coastal Ceará, for example in Acaraú and near Camocim (*c.* 2°54′S, 40°50′W).

COLLARED FOREST-FALCON *Micrastur semitorquatus*

Widely distributed in Brazil, but not hitherto recorded from the extreme northeast (Pinto 1978). However, it is a common species in the semideciduous highland forests of southern Ceará, and we obtained a young male (MN 36282, gonads 7 mm, 510 g, 505 mm total length) from Chapada do Araripe, near Crato (*c.* 7°14′S, 30°23′W) in March 1989.

DOUBLE-STRIPED THICK-KNEE *Burhinus bistriatus*

In Brazil, this species has been recorded from the open grasslands of Roraima and Amapá (Novaes 1974, Pinto 1978). Rather surprisingly, two individuals were observed in 1984 by R. Otoch on the dunes of Jericoacoara, coastal Ceará (*c.* 2°48′S, 40°29′W).

VIOLACEOUS QUAIL-DOVE *Geotrygon violacea*

The presence of *G. violacea* in northeastern Brazil seems to be based on a single male from Usina Sinimbú, Alagoas (*c.* 9°55′S, 36°08′W), mentioned by Pinto & Camargo (1961). We have also observed this species in the forest remnants of Murici (*c.* 9°47′S, 36°50′W).

YELLOW-BILLED CUCKOO *Coccyzus americanus*

A northern migrant and regular visitor to South America, the Yellow-billed Cuckoo has been spottily recorded in Brazil. The MN obtained an adult male (MN 36840, gonads 2 mm, 56 g, 305 mm total length) from Fazenda Cachoeira (*c.* 5°20′S, 30°20′W), near Quixeramobim, central Ceará, on 18 March 1990.

COMMON NIGHTHAWK *Chordeiles minor*

Widely distributed in Brazil, but not hitherto recorded from the northeast, this nighthawk seems to be a rather common species in the Chapada do Araripe, southern Ceará, where the MN obtained an adult female (gonads 3 mm, 75 g, 270 mm total length) on 15 March 1989.

FORK-TAILED WOODNYMPH *Thalurania furcata*

In northeastern Brazil recorded from Piauí to Bahia (Pinto 1978). We obtained one male (MN 36865, gonads 1 mm, 4.4 g, 129 mm total length) and two females (MN 36866, 36867, gonads 1 mm, 4.1 and 4 g, 107 mm total length) from the highland forests of Guaramiranga, Serra de Baturité, Ceará (*c.* 4°15′S, 38°56′W), in February 1990.

SPOTTED PICULET *Picumnus pygmaeus*

Previously known only from southern Maranhão and Piauí to Bahia (Meyer de Schauensee 1966, Pinto 1978). It also occurs in the dry *caatinga* near Santo Antonio da Pindoba, western Ceará (*c.* 35°07′S, 41°04′W), whence we obtained an adult female (MN 36884, gonads 4 mm, 11 g, 106 m total length) on 24 March 1990.

WEDGE-BILLED WOODCREEPER *Glyphorynchus spirurus*

In eastern Brazil, this woodcreeper has been recorded from northern Espirito Santo to southern Bahia (Sick 1985). However, it seems to be more widespread than formerly believed, and we have observed several individuals on Itaparica island and also near Camamú (*c.* 13°57′S, 39°07′W), northern Bahia.

STRAIGHT-BILLED WOODCREEPER *Xiphorhynchus picus*

Teixeira *et al.* (1988) attributed to *X. spixii*, an Amazonian species, a subadult woodcreeper collected in Serra de Baturité, Ceará, on 8 February 1986. Recently, we have had the opportunity to obtain additional material from the same locality and, as a result, we consider that this bird is the subadult of *X. picus*, which seems to be undescribed until now. It is notable that immatures of *X. picus* are rather similar to adults of *X. spixii* in their slender, slightly curved and blackish bill, and the light buff coloration of the throat and streaks on the underparts.

BLACK-BILLED SCYTHEBILL *Campylorhamphus falcularius*

Previously known only from Argentina, Paraguay and southeastern Brazil (from Rio Grande do Sul north to Espirito Santo and eastern Minas Gerais; Pinto 1978), this species also occurs in the northeast. On 3 October 1983 we obtained an adult female (MN 34302, gonads 9 mm, 38 g, 248 mm total length) from the semideciduous forests of Boa Nova, Bahia (*c.* 14°32′S, 40°22′W).

PECTORAL ANTWREN *Herpsilochmus pectoralis*

Only known from Maranhão and Bahia, this species seems to be more widespread in northeastern Brazil than previously believed. According to our latest observations, *H. pectoralis* is a very common formicariid in the wooded *restingas* of Baia Formosa, Rio Grande do Norte (*c.* 6°22′S, 35°00′W).

ORANGE-BELLIED ANTWREN *Terenura sicki*

Known from a few localities of Alagoas and adjacent parts of Pernambuco (Teixeira 1987), the Orange-bellied Antwren also occurs in highland forests of northern Pernambuco, near the Paraiba borders. We have observed several individuals at Engenho Agua Azul, municipality of Timbaúba (*c.* 7°31′S, 35°19′W) in May 1989.

BUFF-THROATED PURPLETUFT *Iodopleura pipra*

Described in 1885, *Iodopleura pipra leucopygia* is based in two males of unknown origin. As mentioned by Snow (1982), these specimens (BMNH 88120969, 88120970) were obtained by Salvin from H. Whitely senior, a well-known London dealer in natural history material, and were considered to come from British Guiana; but Snow suggested the possibility that they might have come from somewhere in northeastern Brazil. During recent years, we confirmed that this cotingid inhabits the Atlantic Forests of northeastern Brazil, whence we obtained an adult female (MN 36379, gonads 5 mm, 10.5 g, 105 mm total length) and an adult male (MN 36380, gonads 2 mm, 9.6 g, 101 mm total length) from Mamanguape, coastal Paraíba (*c*. 6°50′S, 35°07′W) in May 1989. It may also be noted that the USNM houses a fifth skin (USNM 536504), an adult female by plumage, collected by W. L. Ellison in Garanhuns, Pernambuco (*c*. 8°54′S, 36°29′W) in July 1957. This material is presently under study, and we stress that *I. pipra leucopygia* differs considerably from the nominate form of the species by the broad white rump-band, contrasting superciliary stripe and extensively whitish underparts. This pattern resembles the plumage of the White-browed Purpletuft *Iodopleura isabellae* in some aspects, and may explain the record of this species from Murici (Teixeira *et al*. 1987), which in fact must be attributed to *I. pipra leucopygia*. This cotinga seems to be not uncommon in the forest remnants of northeastern Brazil, and some other individuals have even been observed in the urban area of João Pessoa, Paraíba (*c*. 7°07′S, 34°52′W), feeding on the fruits of *Phthirusa pyrifolia* (Loranthaceae) in the canopy.

WOOD PEWEE *Contopus virens*

A winter visitor, only recorded previously in western Amazonian Brazil (Meyer De Schauensee 1966, Sick 1985). We obtained a young female (MN 36400, gonads 2 mm, 14 g, 151 mm total length) from the semideciduous forests of Chapada do Araripe, southern Ceará, on 24 March 1989.

BUFF-BREASTED TODY-TYRANT *Idioptilon mirandae*

According to the South American ornithological literature (Meyer de Schauensee 1966, Fitzpatrick & O'Neill 1979, etc.) this tyrannid is only known from four localities of northeastern Brazil. However, it is a very common species throughout a rather extensive range, which includes the humid highland forests of Ceará (e.g. Serra de Ibiapaba, Serra de Baturité) and also the hinterland semideciduous forests of Paraíba (Areia, *c*. 6°58′S, 35°42′W), Pernambuco (Garanhuns and Lagoa do Ouro, *c*. 9°16′S, 36°20′W) and Alagoas (Quebrangulo, *c*. 9°20′S, 36°29′W).

BLACKBURNIAN WARBLER *Dendroica fusca*

A winter visitor, only recorded previously from extreme northern Amazonian Brazil (Roraima; Sick 1985). We obtained an adult female (MN 36450, gonads 1 mm, 8.5 g, 130 mm total length) from the semideciduous forest of Chapada do Araripe, southern Ceará, on 21 March 1989.

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On the linkage between *Anodorhynchus* macaws and palm nuts, and the extinction of the Glaucous Macaw

by Carlos Yamashita & Mauro de Paula Valle

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The genus *Anodorhynchus* is represented by blue macaws with huge heads (Sick *et al.* 1987) and powerful bills. All of them have bare skin around the eye and at the base of the lower mandible (Forshaw 1973, Sick *et al.* 1987). The three recognised species in this group, Hyacinthine Macaw *A. hyacinthinus*, Lear's Macaw *A. leari* and Glaucous Macaw *A. glaucus*, are South American and clearly monophyletic. The first split among them was probably between *hyacinthinus* and *glaucus-leari*. The *glaucus-leari* branch was isolated in marginal, semi-arid eastern habitats, and later differentiated into two forms, the Glaucous Macaw in *chaco* vegetation in the south and Lear's Macaw in *caatinga* vegetation in the north (Vielliard 1979). Considerable doubt attaches to another hypothetical member of the genus, which may have inhabited Guadaloupe in the West Indies, according to accounts by early travellers (Greenway 1967).

This genus of macaws has the strongest "square chisel" on the gnathotheca, the horny part of the lower mandible, among all Psittaciformes. The Hyacinthine and Lear's Macaws use the cutting edge of the chisel as a wedge to split palm nuts in two. Information on these two species, independent of phytogeographical information, suggests that the distribution of the genus is closely linked to palm groves. They are highly specialised macaws, subsisting almost entirely on palm nuts (Sick *et al.* 1987, Munn *et al.* 1987, Yamashita 1987, Brandt & Machado 1990).

The status of the genus today is critical. The Glaucous Macaw is extinct, the other two species endangered. Surveys carried out in the last few years show that Lear's Macaw persists in a tiny population of about 60 individuals (Yamashita 1987, Brandt & Machado 1990), while the population of the Hyacinthine Macaw has been estimated at between 2500 and 5000 individuals, and is declining (Munn *et al.* 1987). The group has suffered from excessive trapping and from the decline of palm groves in the semi-arid region.

The purpose of this paper is to discuss the specialisation of the feeding habit on palm nuts by *Anodorhynchus* and to present arguments about the relationship of the Glaucous Macaw and its process of extinction.

Historical data on the Glaucous Macaw

Comments on the Glaucous Macaw were first published by Sanchez Labrador (1767) who wrote that the *Guaa'-obi* lived along the banks of the Uruguay River, and to a lesser extent, in the forest near the Paraguay River (Castex 1962–63). In the Guarani language of these regions *guaa* is an onomatopoeic name for macaw, and the word *obi (hovy)* is a colour gradient from blue to green.

The species was described by Vieillot in 1816, as *Anodorhynchus glaucus*, based on Azara (1805). Vieillot assumed 'Paraguay' as the home of the species, a general name then for a region of southern South America. Azara lived in South America from 1781 to 1801. As an officer of the King of Spain, in order to establish the limits between the territories of Spain and Portugal, he measured the degrees of latitude continuously during his travels. He wrote that the *Guaa'-hovy* was a common bird along the banks of the Parana and Uruguay Rivers between 27° and 29° S, and was told that the species reached 33° S on the Uruguay River (Azara 1805).

There are about seventeen skins of Glaucous Macaw, but only three of them, from the US National Museum, give reasonable mention of provenance. These three specimens were collected during the "Exploration of Parana" by U.S. Navy Expeditions in the 1850s. The labels of these specimens show Corrientes as their provenance. One of the labels also says "Ararana", whereas in the Tupi-Guarani language "arara" refers to 'common macaw'. The Glaucous specimen is thus likely to have been recognised as a distinctive species. The specimens were described as *A. cinereus* in the registration book of the museum. Probably other specimens were collected by that expedition, as indicated by a letter of Cassin to Page (Page 1859). However, there is no specimen in the Philadelphia Academy of Sciences, where Cassin worked, and we do not know the destination of these skins. It is possible that they had gone to the U.S. National Museum, but we do not have concrete evidence. In addition, we could not find reference to Page's "Second Exploration of Parana".

Feeding specialisation of *Anodorhynchus* macaws

Method of study

In order to compare available measurements of the bill apparatus between palm nut specialists and non-specialists, measurements of the chisel width of three *Anodorhynchus* and another 13 species were taken in preserved specimens in the AMNH, USNM, BMNH, MNRJ and MUSP. Palm nuts opened by macaws were collected to illustrate the different pattern of cuts in these two groups.

A satisfactory analysis can be made of the Hyacinthine Macaw's feeding habits. Four species of colonial palms are distributed in the Paraguay basin region: *Copernicia alba* ("Caranda"), *Acrocomia* cf. *aculeata* ("Bocaiuva"), *Scheelea phalerata* ("Acuri") and *Orbignia martiana* "Babassu"). Measurements of diameter on samples of nuts of these palms were taken and compared with the measurements of chisel width of the Hyacinthine Macaw. *C. alba* and *A. aculeata* nuts (diameters measured on the middle axis) are small in relation to the apparatus of the Hyacinthine Macaw. In the case of *S. phalerata* and *O. martiana* nuts, whose size and shape do not permit the macaws to cut them in the middle, the measurements are taken from the lateral part of the longer axis. This position was defined as a distance of 23 mm from the extremity of *S. phalerata* nuts by Hyacinthine Macaws. The sample of nuts used for analysis consisted of unused nuts, without mesocarp and exocarp, collected randomly in the Paraguay basin.

TABLE 1
Chisel width measurements of macaws and some other parrots

	n	Range (mm)	Mean	s.d.
Non palm-nut specialists				
Ara nobilis	5	6.6–7.8	7.4	0.28
Ara manilata	7	6.8–8.1	7.4	0.28
Ara severa	4	7.2–7.8	7.5	0.23
Ara maracana	7	7.2–8.3	7.7	0.33
Ara auricollis	6	7.6–8.4	7.9	0.15
Cyanoliseus patagonus	2	7.8–8.5	8.1	
Ognorhynchus icterotis	1	9.3	9.3	
Guaruba guarouba	6	9.4–10.8	10.4	0.36
Cyanopsitta spixii	5	7.0–7.6	7.2	0.25
Ara rubrogenys	1	11.6	11.6	
Ara ararauna	14	10.8–11.9	11.3	0.24
Ara macao	16	11.2–13.5	12.2	0.62
Ara chloroptera	14	13.8–17.6	15.4	0.98
Palm-nut specialists				
Anodorhynchus leari	7	19.0–26.8	22.4	2.60
Anodorhynchus glaucus	8	22.0–26.0	24.2	1.40
Anodorhynchus hyacinthinus	10	26.3–32.7	30.6	1.76

Note. In the large macaws, chisel width is not proportional to size. Species of similar weight, e.g. *A. leari*, *A. ararauna* and *A. macao*, can have very different chisel widths; *A. rubrogenys* is smaller than *A. ararauna* but has a wider chisel. Some conures have very wide chisels in proportion to their size.

We also measured the cut-edge diameter of *S. phalerata* and *Syagrus coronata* nuts opened by Hyacinthine Macaw and Lear's Macaw respectively. Using these data we calculated a ratio between chisel size and size of opened nuts, and from this derived a likely value for the diameter of nuts suitable for use by the Glaucous Macaw. We present measurements of *Butia yatay* nuts (probably the main food of Glaucous Macaws) from a cultivated specimen.

Results and discussion

Species of the genus *Anodorhynchus* show the highest value for chisel width among the macaws (Table 1). A comparison of nuts that had been cut by *Anodorhynchus* with nuts cut by *Ara chloroptera* (Fig. 1) well illustrates the difference between the palm-nut specialist and the non-specialist. There is no doubt that *Anodorhynchus* spp. are highly specialised to exploit palm nuts; no other animal can cut a palm nut so cleanly.

However, this group of macaws is highly selective in relation to palm species. Only a small number of palms meet their requirements of size and shape of nuts, and morphology of endosperm, which must be extractable and have a pattern of lignin that permits its use. A feeding habit of this kind, based on only one or a few species, results in a high degree of dependency. Also, in the case of birds as large as *Anodorhynchus*, an

Figure 1. Palm nuts opened transversely by macaws. The nuts on the left were cut crudely by a non palm-nut specialist, the other nuts were all cut with precision by a palm-nut specialist. Left to right: "Bocaiuva" palm (*Acrocomia* c.f. *aculeata*) cut by Red and Green Macaw *Ara chloroptera*, "Acuri" palm (*Scheelea phalerata*) cut cleanly by Hyacinthine Macaw *Anodorhynchus hyacinthinus*, "Licuri" palm (*Syagrus coronata*) cut cleanly by Lear's Macaw *A. leari*.

abundant supply of nuts is essential. This requirement can only be met by colonial palms occurring in dense patches. According to Hauman (1919) the colonial palm species have very special soil requirements.

In the Paraguay basin, Hyacinthine Macaws show a preference for nuts of *S. phalerata* and, to a lesser extent, *A. aculeata*. Figure 2 shows that *S. phalerata* has the most suitable size in relation to chisel size of the macaw; *A aculeata* is smaller. In this area there are two other colonial palm species which might be used. One of them, *C. alba*, has an unsuitable lignin pattern, while the other, *O. martiana*, has nuts that are too large for the birds to be able to cut. So groves of these two palms are of no importance to Hyacinthine Macaws.

When we compare the chisel width of Hyacinthine and Lear's Macaws with the diameter of the nuts that they exploit, we find a similar relationship between their respective average values. The ratio of chisel width to nut diameter is 1.39 for Lear's and 1.19 for the Hyacinthine Macaw (nut diameter for Lear's Macaw: *Syagrus coronatas*, mean 17.1, range 14.2–20.6 mm; other measurements as in Table 1 and Figure 2). Using the mean of these two ratios we can calculate a nut diameter that should have been suitable for the Glaucous Macaw. The expected diameter would be about 19 mm. There are five colonial palm species in the former range of the Glaucous Macaw: *Copernicia alba* ("Carandai"), *Syagrus [Arecastrum] ramazoffianum* ("Pindo"), *Trithrinax campestris*,

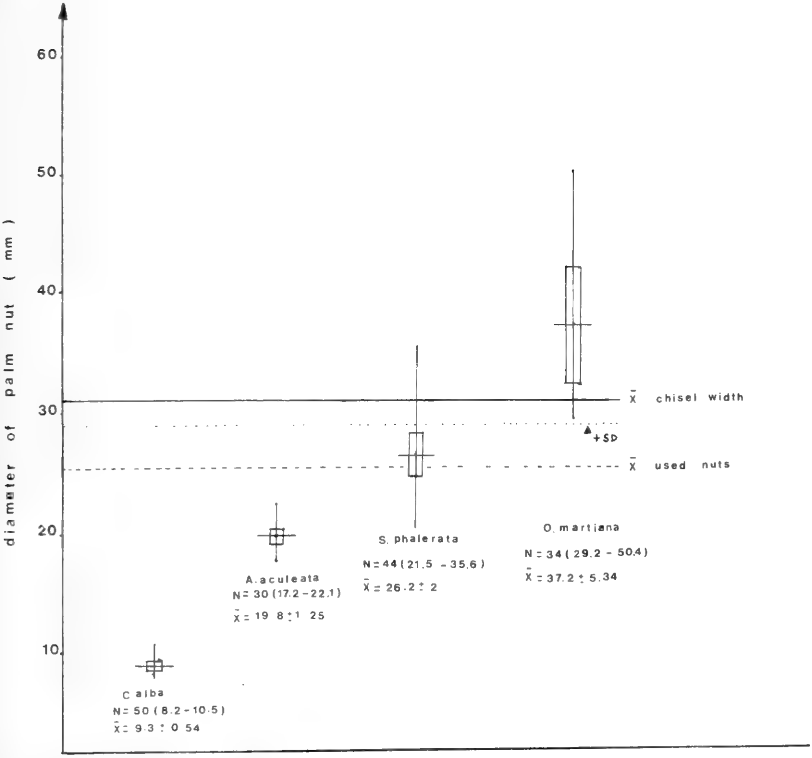

Figure 2. Chisel width of Hyacinthine Macaw, and diameters of random samples of nuts of sympatric colonial palm species in the Paraguay basin. *Copernicia alba* (nuts small, with many vermiculate lignin walls in the endosperm) is not utilised. *Acrocomia* cf. *aculeata* and *Scheelea phalerata* are eaten by Hyacinthine Macaws. Nuts of *Orbignia martiana* are sporadically used; because of their large size, only a very low percentage are available to the macaws (less than 5% in the sample measured). In other parts of the Hyacinthine Macaw's range palm-nut selection is similarly based on nut size and endosperm morphology.

Acrocomia aculeata ("Bocaja") and *Butia yatay* ("Chatay"). The lignin pattern of "Carandai" had been mentioned earlier (see also Fig. 2); it is unsuitable, as also is the lignin pattern of *Trithrinax* and "Pindo" (which on the basis of size would be suitable). "Bocaja" has nuts of suitable size and structure, but only occurs marginally, at the edge of the range of the Glaucous Macaw. The only colonial palm species that has nuts of the right size, with extractable endosperm free of lignin, is the "Chatay" palm; its nuts (from our sample) have a mean diameter of 15.4 mm.

Extinction of the Glaucous Macaw

Labrador (1767) and Azara (1805) agree that the Glaucous Macaw was associated with river-bank cliffs on the Uruguay River. Labrador (1767) wrote that the "Guaa'-obi" occurred to a lesser extent in forest near the Paraguay River. It is possible that his "Guaa'-obi" refers to the Hyacinthine Macaw at the southern limits of its range in northern Paraguay, where it is rare, and only the bird from the Uruguay River refers to the Glaucous Macaw. Nowadays in Paraguay, "Guaa'-hovy" is a commercial name of Hyacinthine Macaw. Also Sick *et al.* (1987) mention possible identification problems between Hyacinthine and Lear's Macaws, so Labrador (1767) may have used the same name for both species.

Azara (1805) said that the Glaucous Macaw was a common bird between latitudes 27° and 29°S, a very restricted range slightly wider than 200 km. Comparing Azara's data (1923) with current surveying techniques, given the methods used in his day, each latitude could be in error by 0.5°. He was told that the Glaucous Macaw on the Uruguay River reached 33° S, which suggests that he did not personally see it so far south, or that the bird used a very small area there or was locally extinct, because he travelled through almost the entire Viceroy of La Plata (very large portion of South America) during 20 years. We think it quite likely that when the Glaucous Macaw was first reported by naturalists, the relict population was already extremely local and declining.

Original accounts describing the Glaucous Macaw as a very common bird are typical of a naturalist's reaction when encountering a sedentary and conspicuous population of any species of *Anodorynchus*. In some localities *Anodorynchus* are very conspicuous, have a very high site-fidelity, are noisy and travel daily in flocks along predictable flight paths. For instance, biologists observing Lear's Macaw, which now has a very small population, have no difficulty in seeing the birds every day. Likewise when visiting the correct sites, observers perceive Hyacinthine Macaws as very abundant because of their high site-fidelity. Since Hyacinthine and Lear's Macaw specialise on palm nuts, it is very unlikely that Glaucous Macaw did not as well. No doubt the Glaucous Macaw suffered from the same process of palm grove decline as Lear's Macaw is experiencing today (Yamashita 1987, Brandt & Machado 1990). So far we do not know what long-term effect cattle may have on palm groves used by Hyacinthine Macaws. In the Pantanal region, this macaw is commonly seen near the farm houses, which are on higher terrain also favoured by the crucial colonial palms.

The available information on the Glaucous Macaw thus suggests a very restricted range and problems with the decline of palm groves. Its extinction, which seems not to be in doubt, was probably caused by the long-term effect of the introduction of domestic herbivores. It is very well known that in the La Plata region (former range of Glaucous Macaw) palm groves subject to grazing pressure from cows tend to senesce and decline (Hauman 1919, Castellanos & Ragonezi 1949). There has been no palm regeneration in the range of this extinct macaw, and the remnant palm groves are more than 200 years old (Castellanos & Ragonezi 1949).

During his fieldwork at the end of the 18th century, Azara's expedition mainly ate the meat of armadillo and feral cattle. We therefore know that, by that time, feral cattle were already established. Since the European colonisation of the La Plata region, more than 400 years ago, steady grazing pressure from introduced cattle has decreased the size and health of "Chatay" palm groves and few, if any, new trees have been recruited into the population of reproducing palms. No *Anodorynchus* can survive without healthy palm groves.

Finally, we may suggest a method that may yield additional information. When feeding, all *Anodorynchus* often carry in their beak nuts or pieces of raceme with nuts in order to open them in the top of a big tree or on the side of a cliff. Where these macaws occur, these characteristically severed pieces remain conspicuous for many years. Based on the fact that *Anodorynchus* are such highly specialised feeders on palm nuts, it may be possible to search for evidence of extinct (or hypothetical) *Anodorynchus* in the Caribbean (e.g. *A purpurescens*) by searching for cracked nuts in suitable palm habitats. This may also provide more precise dating for the occurrence of the Glaucous Macaw within its former range, and may enable its range to be defined more exactly.

Summary

Anodorynchus macaws are specialised palm-nut feeders, requiring dense stands of palms. Based on our understanding of the two living species, we believe that the Glaucous Macaw *A. glaucus* was a very specialised species, with a restricted distribution. In particular, we believe that when first reported by naturalists, the relict population was already extremely local and declining. This opinion is based on the relationship between palm-nut size and structure and the macaw's bill size, which indicates that only the "Chatay" palm (*Butia yatay*) could have been the Glaucous Macaw's main food source. The "Chatay" palm groves suffered decline caused by the introduction of cattle, and today they are all senescent.

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On a *Phoebetria* specimen from southern Brazil

by Edwin O. Willis & Yoshika Oniki

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A *Phoebetria* albatross from São Paulo, Brazil (Bertioga beach, 28 August 1954, Museum of Zoology of the University of São Paulo, MZUSP) was identified as *P. palpebrata* by Pinto (1964) and Teixeira *et al.* (1988), the latter doubting our identification (1985, based on a suggestion by R. Grantsau) as *P. fusca*. The 1988 paper also cites a secondary source (Sick 1985), but there is no evidence Sick had identified the specimen himself. Sick overlooked September records of *P. fusca* off the Brazilian coast from 33°22′S, 47°41′W to 28°45′S, 41°02′W (Rumboll & Jehl 1977). *P. palpebrata* is a subantarctic species said to occur in southern Brazil (Vooren & Fernandes 1989), although Rumboll recorded it only at and below the subtropical convergence at 40°–45°S.

After re-examining the MZUSP specimen and others in the British Museum (Natural History) and American Museum of Natural History (New York), we confirm the Bertioga bird as *P. fusca*. It is a dark individual, slightly paler-bodied like all *P. fusca* (see picture in Sinclair 1987; Teixeira *et al.* are incorrect in calling *P. fusca* "entirely sooty brown").

The specimen probably would not have been confused with whitish or ashy-bodied *P. palpebrata* except for certain suggestions in Murphy (1936), some repeated in later field guides. Specifically, we urge caution in using his suggestions of culmen shape (as by Pinto 1964) and about juveniles. Teixeira (pers. comm.) thought the MZUSP bird could not be *P. fusca* because it has a dark orange mandibular stripe rather than the orange one of adult *P. fusca* specimens, yet has pale shafts and dark plumage that Murphy describes as adult.

First, the concave culmen that Murphy shows for *P. palpebrata* is variable and changes with viewing angle; at any rate, we find the culmen of the São Paulo specimen rather straight, contra Pinto (1964). The least central depth of the closed bill is 25.0 mm, above averages of *P. fusca* (24.9 mm, s.d. 0.7; $n=16$) or *P. palpebrata* (23.7 mm, s.d. 1.4; $n=9$). Although these means differ significantly ($t=2.85$, $P<0.005$), recent field guides are probably right to omit this as a field character.

Second, young *Phoebetria fusca* have dusky primary shafts (Richard A. Sloss, *in litt.*; downy birds at AMNH) but, contrary to Murphy (1936) and later field guides, mostly pale shafts by the time they fly (Willis and Sloss, AMNH no. 527083; P. R. Colston *in litt.*, BMNH 1953-55-98). Colston indicates that the last specimen has down on neck, breast and flanks. BM 1953-55-97, also from Tristan da Cunha, is a similar bird ("left the nest too soon" and died after a week in captivity, 22 May 1952) with pale shafts and is almost identical in colour to the São Paulo bird. Thus, the age of flying birds cannot be judged by shaft colour.

Third, the pale-scalloped neck region Murphy (1936) reports for young *P. fusca* seems variable. Some birds (as the BMNH bird that left the nest too soon) have little scalloping, others more. Murphy failed to describe young *P. palpebrata*, which are also variable but can be much more scalloped with pale than are young *P. fusca*. Any scalloping present would show up more in the field in dark young *P. fusca*, since *P. palpebrata* are always pale-bodied, but we would not use lack of scalloping as an indication of age; some dark-billed young seem little more scalloped than adults of their respective species.

Fourth, young *P. fusca* have a dark and not pale stripe on the lower mandible (Harrison 1983; not mentioned in Murphy 1936). Washing one stripe of the São Paulo specimen revealed yellow underneath. We suspect the dark bill stripe may persist for several months after young *P. fusca* go to sea, and that the MZUSP specimen is such a young bird, despite its pale shafts (dark near the tips) and relatively slight neck scalloping.

Like Murphy (1936), we found tails of *P. fusca* slightly shorter than *P. palpebrata*, bills slightly longer. The São Paulo specimen has such a short tail (227 mm) that, among males of the two species, it is only like the Tristan fledgling (225 mm). Perhaps young go to sea with short tails; if so, the short tail of the specimen might be a further indication of immaturity.

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IN BRIEF

NEW DISTRIBUTIONAL RECORDS FOR HOUSE SPARROW *PASSER DOMESTICUS*

In October 1991, Mr A. B. Crease found House Sparrows *Passer domesticus* present at the Holiday Beach Hotel on Curaçao, about $1\frac{1}{2}$ km west of Willemstadt. I spent two days on Curaçao in October 1988 but saw no trace of House Sparrows, despite searching the island thoroughly for birds. This points to a recent colonization, though Mr Crease saw up to 10 birds at a time, suggesting that the species was already well established in 1991. The provenance of the Curaçao birds is not known; assisted ship-borne passage seems most likely, either on a Caribbean cruise liner—House Sparrows were introduced to the Bahamas and Cuba in the 19th century and are now present as well on Hispaniola, Puerto Rico, and the Virgin Islands (American Ornithologists' Union 1983, *Check-list of North American Birds*)—or from Panama which was reached by 1981 by birds spreading south through Central America (Reynolds & Styles 1982, *Rev. Trop. Biol.* 30: 65–77).

Gibson *et al.* (1988, *Am. Birds* 42, 45–144) describe a female House Sparrow in Petersburg on 23 October 1987 as the first certain record for Alaska, overlooking the sighting of 4–5 birds at Anchorage Airport in June 1981 by Mr C. R. Cole (Summers-Smith 1988, *The Sparrows*).

The above reports and the first record for Japan—a male and two juveniles on Rishiri Island, Hokkaido, from 4–7 August 1990 (Sana 1990, *Jap. J. Orn.* 39: 33–35)—show how the worldwide expansion of this most successful species is continuing.

I am grateful to Mr A. B. Crease for sending me the record of House Sparrows on Curaçao.

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J. D. SUMMERS-SMITH

25 March 1992

AN OBSERVATION OF BATELEUR *TERATHOPIUS ECAUDATUS* IN NORTHERN TUNISIA

During a study of migration strategies of passerines carried out in Tunisia during the springs of 1989 and 1990 by the Ottenby Ornithological Research Centre, I spent six weeks in April and May 1990 at Sidi Ali el Mekki (37°10′N, 10°14′E), 40 km north of Tunis, in Tunisia. The daily activities included mist-netting, line transects and orientation tests in Emlen-funnels. The study site was situated close to the sea, south of an east-west ridge that rises to about 100 m a.s.l. Almost every day small to high numbers of raptors, storks and other birds were seen on migration eastwards along the ridge.

On 8 May 1990 the weather was relatively calm with some overcast but alternating with sun and some small rain-showers. During the day a moderate number of raptors were seen moving NE (130 Honey Buzzards *Pernis apivorus*, 1 subadult Steppe Eagle *Aquila nipalensis*, 2 Pallid/Montagu's Harriers *Circus macrourus/pygargus*). At about 2.30 p.m. I discovered a large dark raptor (larger than a Honey Buzzard), with a relatively short tail, among a flock of soaring Honey Buzzards. I immediately realised that, from its V-shaped wings, short tail and the buoyant and jerking soaring flight, the bird resembled a Bateleur *Terathopius ecaudatus*, a species that I am familiar with from several trips to tropical Africa. I observed it for about 5 minutes (10 × 40 binoculars) in fairly good light at distances between 500 m and 2 km, and concluded that it was a Bateleur, in second plumage.

Description

A large short-tailed raptor, larger than the accompanying Honey Buzzards but smaller than Short-toed Eagle *Circaetus gallicus*. The bird appeared almost totally dark brown. The underside, which I saw best, was evenly dark brown apart from a pale band along the whole wing between the underwing coverts and the remiges (probably caused by a pale base of the remiges). There was also a pale patch on the underside of the head and/or the throat. The upperside, which I did not see very well, seemed to be totally dark brown.

The bird used very few wing-beats during an observation time of about 5 min. During the soaring and gliding flight, which were very light and buoyant, the bird seemed unsteady, jerking or tipping from side to side like a paper-swallow. In flapping flight the wing beats were deep and relatively fast for a bird of its size. Both gliding and soaring flight were on highly raised V-shaped wings with an extra bend on the outermost part of the primaries, like the cross-section of an old Viking ship. The whole wing was relatively broad except for the primaries which were held together making the wing-tip pointed and the trailing edge almost S-shaped. The trailing edge was smooth without any traces of moult. The tail was short and rounded or slightly wedge-shaped, just protruding behind the trailing edge of the wing, almost like the tail of a Lesser Spotted Eagle *Aquila pomarina*. The head was rather conspicuous and seemed to be bent downwards, giving a hooklike impression.

The Bateleur is a widespread species in various habitats in Africa south of the Sahara. It shows no strong evidence of migration but there are records of north to south movements in West Africa in response to wet and dry seasons, and irregular stragglers cross the Red Sea to southern Arabia (Brown *et al.* 1982, *The Birds of Africa*, vol. 1). There are also some accidental records from Iraq (Harrison 1955, *Bull. Brit. Orn. Cl.* 75: 60–61) and Israel (Shirihai & Yekutiel 1988, *Raptors in Israel: passage and wintering populations*. Birdwatching Center Eilat, Israel).

As far as I know this record is the first observation of the Bateleur in Tunisia and possibly also in this part of North Africa.

Thanks to Susanne Åkesson and Nils Kjellén for comments on the manuscript. This is report no. 137 from the Ottenby Bird Observatory.

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Sweden.

27 April 1992

BOOKS RECEIVED

Cook, M. 1992. *The Birds of Moray and Nairn*. Pp. xiv + 263, 48 text-figures, black-and-white drawings. Mercat Press (at James Thin, 53–59 South Bridge, Edinburgh EH1 1YS). ISBN 1873644 051. £9.95. 23 × 15 cm.

The first book to be written this century about the birds of a rich and varied area of Scotland, ranging from the coast up to the top of the Cairngorms. A 22-page introductory section is followed by the species accounts, many of which are illustrated by distribution maps of breeding (based on a 5 × 5 km grid) or, in the case of migrants, histograms of occurrence by half-monthly periods, as well as by good drawings or photographs. Authoritative and well produced (strongly bound, with soft covers), this is a valuable addition to Scottish ornithology.

Ferns, P. F. 1992. *Bird Life of Coast and Estuaries*. Pp. xiv. + 336, 90 text-figures. Cambridge University Press. ISBN 0-521-34569-3 (hardback). £29.95. 25 × 19 cm.

This is the second in the Cambridge series of books on the bird life of major habitat types in the British Isles. A broad survey, but with plenty of relevant detail, by an expert on coastal ecology, it maintains the high standard set by Derek Ratcliffe's *Bird Life of Mountain and Upland* (see review in *BBOC* 111: 56), though in somewhat less evocative style. A useful introductory chapter on the coastal environment is followed by chapters discussing the origin, evolution and ecology of the birds inhabiting coastal waters and the main types of coast, with, finally, a long (70-page) chapter on threats to coastal birds, especially habitat loss, pollution, and some of the effects of fisheries.

This is a sound, factual account, very useful as a background text for anyone interested in coastal birds. In addition to the many maps and diagrams, the 90 text-figures include a number of well reproduced photographs, and 15 attractive drawings of birds by Chris Rose.

Tostain, O., Dujardin, J.-L., Erard, C. & Thiollay, J.-M. 1992. *Oiseaux de Guyane*. Pp. 222, numerous illustrations. Société d'Etudes Ornithologiques (Muséum d'Histoire Naturelle, Laboratoire d'Ecologie Générale, 4 avenue du Petit Château, 91800 Brunoy, France). ISBN 2-950648-0-0. 25 × 17 cm. Obtainable from Natural History Book Service Ltd., 2-3 Wills Road, Totnes, Devon TQ9 5XN; £35.

French Guiana, of all South American countries the least disturbed by man and still almost entirely covered by primary forest, has until now had no book devoted to its birds. In fact, little ornithological research had been undertaken there, and that mainly in the coastal strip and barely at all in the uninhabited interior, until the intensive and productive research programme begun by French workers in the mid-1970s. Its extraordinarily rich bird life is now fairly well known, and is described in this book by four of the principal workers in the field. After 19 pages of introductory matter (climate, descriptions of habitats etc.), the systematic section presents a remarkable amount of information in compact form. Under the main headings Habitat, Distribution and Nidification, with some other headings used where necessary, the information available for each species is summarized. There is no attempt to illustrate every species (illustrations are already available in other standard works), but there are many excellent photographs, some paintings, distribution maps, and a variety of diagrams illustrating breeding seasons and other ecological data. All illustrations are in colour. A considerable amount of unpublished information is included, as well as references to all relevant published work (the compact bibliography occupies 10 pages). There is a 7-page English summary covering the introductory matter.

Because it fills an important gap in the literature of South American birds, this is a book for the serious worker; and it will also serve the amateur birdwatcher well, who will almost certainly possess another identification guide. The poor sterling exchange rate no doubt partly accounts for the high price.

NOTICE TO CONTRIBUTORS

Papers, from Club Members or non-members, should be sent to the Editor, Dr D. W. Snow, The Old Forge, Wingrave, Aylesbury, Bucks HP22 4PD, U.K., and must be offered solely to the *Bulletin*. They should be typed on one side of the paper, with **treble**-spacing and a wide margin, and submitted in duplicate. The style and lay-out should conform with usage in this or recent issues of the *Bulletin*.

A contributor is entitled to 10 free offprints of the pages of the *Bulletin* in which his contribution, if one page or more in length, appears. Additional offprints or offprints of contributions of less than one page may be ordered when the manuscript is submitted and will be charged for. Authors may be charged for proof corrections for which they are responsible.

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Indices: Vol. 70 and after £1.50 each; Vols. 50–69 £2.50 each; Vol. 49 and before £6 each.

Long runs (10 years or more) for Vol. 50 and after are available at reduced rates on enquiry. Postage and packing extra. Orders over £50 post free. Special issue Vol. 112A, 1992, in hardback, 300p, £32, inc. p&p.

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Only Members of the British Ornithologists' Union are eligible to join the Club; applications should be sent to the Hon. Treasurer, as below, together with the annual subscription (£8.50 or, if preferred, U.S. $22 for 1993, postage and index free). Changes of address and any correspondence concerning membership should be addressed to the Hon. Treasurer.

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CORRESPONDENCE

Correspondence about Club Meetings and on all other matters should go to the Hon. Secretary, Mrs A. M. Moore, 1 Uppingham Road, Oakham, Rutland LE15 6JB, U.K.

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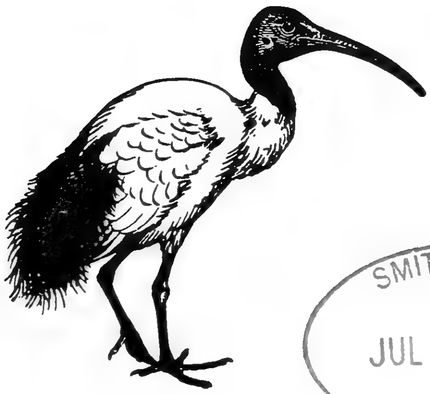

Edited by
Dr D. W. SNOW

Volume 113 No. 2 June 1993

FORTHCOMING MEETINGS

Tuesday, 27 July 1993. Professor Charles Pilcher will speak on "Kuwait". Professor Pilcher has been Professor of Pharmacology at the University of Kuwait for some years. He has detailed knowledge of the ornithology of the area, and has directed the ICBP surveys on the environmental situation which were undertaken there after the Gulf War.

Those wishing to attend are asked to notify the Hon. Secretary by Tuesday, 13 July 1993.*

Tuesday, 21 September 1993. Dr Geoffrey Davison will speak on "Pheasants in Malaysian Rain Forest". Dr Davison is a zoologist who has lived in Malaysia for the past 18 years, specialising in the study of pheasants and partridges. He has lectured at the National University of Malaysia for 10 years and has just completed the Malaysian National Conservation Strategy.

Those wishing to attend are asked to notify the Hon. Secretary by Tuesday, 7 September 1993.*

Tuesday, 19 October 1993. Dr Clive Mann will speak on "Bornean Birds".

Tuesday, 2 November 1993. Rod Martins will speak on "Where are the limits of the Western Palearctic?".

Tuesday, 7 December 1993. Dr John Fanshawe will speak on his work in the Arabuko-Sokoke Forest in East Africa.

Meetings are held in the Sherfield Building of Imperial College, South Kensington, London at 6.15 p.m. for 7 p.m. A map showing Imperial College will be sent to members on request.

*Late acceptances and cancellations can usually be taken up to the Thursday morning preceding a meeting, although members are asked to accept by 14 days beforehand as arrangements for meetings have to be confirmed with Imperial College well in advance.

If you accept and subsequently find you are unable to attend please notify the Hon. Secretary, 1 Uppingham Road, Oakham, Rutland LE15 6JB (tel. 0572 722788) as soon as possible as the booking can often be offered to another member.

Bulletin of the BRITISH ORNITHOLOGISTS' CLUB

Vol. 113 No. 2 Published: 30 June 1993

The eight hundred and twenty-sixth meeting of the Club was held on Tuesday, 16 February 1993 in the Ante-room, Sherfield Building, Imperial College, South Kensington at 6.15 pm. 29 Members and 18 Guests attended.

Members attending were: R. E. F. Peal (*Chairman*), M. A. Adcock, Miss H. Baker, Cdr M. K. Barritt RN, Mrs D. M. Bradley, Professor R. A. Chandler, Dr R. A. Cheke, I. D. Collins, G. S. Cowles, S. J. Farnsworth, A. Gibbs, Revd T. W. Gladwin, D. Griffin, C. A. R. Helm, R. Kettle, Dr J. F. Monk, D. J. Montier, Mrs A. M. Moore, R. G. Morgan, Mrs M. Muller, P. J. Oliver, R. C. Price, Dr R. Prŷs-Jones, Dr R. Self, Dr D. W. Snow, N. H. F. Stone, M. P. Walters, R. T. Wilson, C. E. Wheeler.

Guests attending were: The Abbé René de Naurois MC (*Speaker*), Mrs B. Adcock, M. J. Bradley, M. L. Castellan, J. de Naurois, Mrs F. Farnsworth, Mrs J. Gladwin, Miss K. Hoff, Mrs D. Hulme, J. Hulme, Mme N. Lecomte, Mrs D. Monk, Mrs M. Montier, P. J. Moore, Mrs E. Peal, Mrs H. Price, Mrs H. Tye, Mrs M. Wilson.

After supper the Abbé de Naurois spoke on the "Breeding seasons of birds in the Cape Verde Archipelago". He gave an account of the breeding birds of the islands, discussing their origin, some Palaearctic and some Afrotropical. He then went on to discuss their breeding seasons, drawing attention to the peculiar climatic regime at the higher altitudes, where rising moisture-filled air condenses to produce a humid cloud layer with mist, resulting in a resurgence of growth of vegetation and a secondary, autumn breeding season in several of the land birds—a regime that has parallels at low latitudes on the dry west coast of South America and in the Galapagos Islands.

The eight hundred and twenty-seventh meeting of the Club was held on Tuesday, 9 March 1993 in the Ante-room of the Sherfield Building, Imperial College, South Kensington at 6.15 pm. 22 Members and 10 Guests attended.

Members attending were: D. Griffin (*in the Chair*), Dr R. P. Prŷs-Jones (*Speaker*), M. A. Adcock, Miss H. Baker, D. R. Calder, Professor R. Chandler, Dr R. A. Cheke, P. J. Conder, Revd T. W. Gladwin, T. J. James, D. J. Montier, Mrs A. M. Moore, R. G. Morgan, Mrs M. Muller, P. J. Oliver, R. E. Scott, Dr R. Self, P. J. Sellar, N. H. F. Stone, Dr D. H. Thomas, M. P. Walters, C. E. Wheeler.

Guests attending were: Mrs B. Adcock, Mrs J. Calder, D. Davenport, Mrs J. Gladwin, Miss K. Hoff, Mrs M. Montier, P. J. Moore, B. O'Brien, Mrs C. O'Brien, M. Paling.

The speaker after supper was Dr Robert Prŷs-Jones who spoke on "Waders and Lemmings in north-eastern Taimyr, Siberia". He gave an illustrated account of a joint Russian/Dutch/British South African expedition which visited the arctic tundra west of Pronchishcheva Lake (75°16′N, 112°28′E) in the far north-eastern Taimyr during the summers of 1991 and 1992. A major aim was to study the breeding success of waders and Dark-bellied Brent Geese *Branta b. bernicla* in years which we had correctly predicted would have high and low populations of lemmings respectively. In both years, the teams found 73 wader nests of 9 and 8 species respectively in the 14 km^2 study area, but whereas only 5% of nests suffered predation in 1991, over 95% did so in 1992. Nesting success of 16 pairs of Brent Geese, almost all of which nested in fox-exclusion zones around Snowy Owl nests, was similarly high in 1991, but only 2 pairs even attempted breeding in 1992, when Snowy Owls also failed to nest. Those results, and observations on predator numbers and behaviour, provide strong support for the Roselaar-Summers prey-switching hypothesis, under which the abundance of lemmings is the major determinant of the level of predation experienced by tundra-nesting birds.

The eight hundred and twenty-eighth meeting of the Club was held on Tuesday, 27 April 1993 in the Ante-room of the Sherfield Building, Imperial College, South Kensington at 6.15 pm. 28 Members and 12 Guests attended.

Members attending were: R. E. F. Peal (*Chairman*), P. G. W. Salaman (*Speaker*), M. A. Adcock, Miss H. Baker, D. R. Calder, Professor R. Chandler, Dr R. A. Cheke, P. J. Conder, G. D. Field, Rev. T. W. Gladwin, D. Griffin, A. Gibbs, C. A. R. Helm, R. Kettle, Dr J. F. Monk, Mrs A. M. Moore, Dr G. Morel, Dr M.-Y. Morel, R. G. Morgan, Mrs M. Muller, J. G. Parker, V. Sawle, Dr R. Self, P. J. Sellar, R. E. Sharland, N. H. F. Stone, Dr A. Tye, C. E. Wheeler.

Guests attending were: Mrs B. Adcock, Mrs F. Farnsworth, D. Gandy, R. Giles, Mrs J. Gladwin, Mrs S. Griffin, Ms K. Hoff, Mrs D. Monk, P. J. Moore, C. A. Muller, Mrs E. Peal, Mrs H. Tye.

After supper the Chairman gave a review of the Club's affairs over the past year. His address will be published at a later date.

The speaker, Paul Salaman, gave a most interesting talk entitled "Avifauna assisting conservation: an example from the Colombian Chocó", illustrated by stunning photographs by David Gandy. The Pacific slope of the Andes in western Nariño, south-west Colombia, contains probably the world's greatest concentration of endemic birds, plants, herptiles, and butterflies. Its extraordinary biodiversity faces severe danger of extinction, owing to rapidly escalating threats, lack of protection, and a lack of biological fieldwork. During 1991 and 1992, two expeditions from Anglia Polytechnic University, Cambridge, and Universidad del Valle, Cali, assisted by a BOU grant, compiled faunal species inventories, and determined the abundance and ecological requirements of threatened, endemic and poorly known species in seven localities.

A total of 461 bird species were recorded, including 34 endemics and 20 threatened and near-threatened species. Three new species for Colombia were found, and thirty altitudinal and distribution extensions recorded. The most significant discoveries were a distinctive and undescribed vireo species at 1400 m and an apparently new species of *Piculus* at 500 m. A total of 1328 individuals of 218 bird species were ringed, yielding much new information on avian biometrics, identification and abundance.

A conservation strategy was formulated to pin-point areas requiring priority action. The Río Ñambi forest at 1400 m was assigned "critical priority", and subsequently a conservation action plan for its protection was drawn up. Already funds raised have purchased 3000 ha of the Río Ñambi forest and a management plan has been implemented. Our work in south-west Colombia has shown how ornithological field action by student expeditions can rapidly lead to practical conservation measures: playing our part in preserving life on earth.

Some range extensions and five species new to Colombia, with notes on some scarce or little known species

by Mark Pearman

Received 4 February 1992

This paper presents notes on five species previously unrecorded in Colombia from geographical extremes: P. N. Amacayacú, southeastern Amazonas; Cerro Tacarcuna, extreme northern Chocó; and Turbo, northern Antioquia. Three of these species are previously unrecorded from the South American continent. Other range extensions are given for 15 species, 10 of them previously unrecorded on the Colombian side of the 'Darién Gap'. Additionally an altitudinal range extension and vocalization and behavioural notes on 12 scarce or little known species, from nine scattered localities, are included.

Most of the observations are from two main localities: the forested eastern slope of Cerro Tacarcuna, from 50 m to 1300 m, hereafter referred to as "C. Tacarcuna"; and an unnamed Amazonian river island, with early successional growth and lagoons, opposite Puerto Nariño, Amazonas, hereafter referred to as "near Puerto Nariño".

The purpose of this paper is to document sight records made by the author on field trips in January–April 1987, and with John Hurrell in August–September 1987 and September–October 1990. Other sight records made by Rod McCann (RMcC), Frank Lambert (FL), David Willis (DW) and members of the British Ornithologists' Union recent Colombian expedition (BOU) are included where relevant. It serves to update current knowledge of the Colombian avifauna using Hilty & Brown (1986) as a principal source. Sound recordings are deposited in the British Library of Wildlife Sounds, London. Photographic material is deposited with VIREO, Academy of Natural Sciences, Philadelphia.

Species accounts

PEARL KITE *Gampsonyx swainsonii*

Two individuals were observed *c.* 3 km S of Unguia, N Chocó, on 12 October 1990. Apparently not previously recorded W of Gulf of Urabá, Chocó/Antioquia border (Hilty & Brown 1986), this species has been reported twice from Cana, E Darién, Panama, and it has been suggested that colonization is occurring from Colombia (Robbins *et al.* 1985). The first Panamanian record was from the canal Zone in June 1977 (Pujals *et al.* 1977), but there are still no definite breeding records from Panama (Ridgely & Gwynne 1989).

ZONE-TAILED HAWK *Buteo albonotatus*

In Colombia the species is known from the Santa Marta region south to S Magdalena and east of the Andes from SW Meta, W Caquetá and Amazonas (Hilty & Brown 1986). The sighting of an individual at *c.* 400 m on C. Tacarcuna on 7 October 1990 represents a considerable range extension in Colombia. The species has, however, been recorded once near El Real, E Darién, Panama, in July 1975 (Ridgely & Gwynne 1989).

TACARCUNA WOOD-QUAIL *Odontophorus dialeucos*

A covey of 3 was observed at *c.* 1280 m near the ridge of C. Tacarcuna, on 9 October 1990. When alarmed, they ran in short bursts of 2–6 m and climbed onto fallen trees, presumably to look for intruders. This poorly known *Odontophorus*, first discovered in 1963, is endemic to C. Tacarcuna, C. Malí and C. Barigonal, and was included in the IUCN/ICBP 'near-threatened species list' (as defined by Collar & Andrew 1988). The first Colombian record was from P. N. Los Katíos, C. Tacarcuna, Chocó (Rodríguez 1982).

BAIRD'S SANDPIPER *Calidris bairdii*

An individual was photographed at a small lagoon near Puerto Nariño on 30 September 1990. The species normally migrates west of the Colombian Andes and through the paramos of Ecuador and Peru, and was previously unknown from the Amazon basin.

WILSON'S PHALAROPE *Phalaropus tricolor*

An individual was observed and photographed near Puerto Nariño on 30 September 1990, representing the first Amazonian record of the species. It as observed on a small lagoon in close association with one Lesser Yellowlegs *Tringa flavipes* and the Baird's Sandpiper mentioned above.

The species is known as a rare southward transient in Colombia from 5 September/October records and 1 February record (Hilty & Brown 1986). Sick (1979) mentions an August record from Mato Grosso, Brazil, which presumably passed through Amazonia.

RUFOUS-BANDED OWL *Ciccaba albitarsus*

This species was reported as being apparently rare (probably overlooked) by Hilty & Brown (1986), with only one recent record from Finca Meremberg, Cauca, in 1980 (Ridgely & Gaulin 1980). Fjeldså & Krabbe (1990), however, considered it to be common with a spotty distribution in the Andes as a whole.

An individual was readily observed using tape playback lure (thus probably holding territory) on 25–26 March 1987 at P. N. Munchique, Cauca, and another at Chupallal de Perico, P. N. Puracé, Huila, on 11 April 1987. The species appears to be locally common in both Colombia and Ecuador (pers. obs.).

PURPLE-CHESTED HUMMINGBIRD *Amazilia rosenbergi*

Described by Hilty & Brown (1986) as uncommon on the Pacific coast, occurring to 200 m (probably higher?). Three males were observed at 400 m at La X, Chocó (*c*. 50 km E of Quibdó, on the Medellín road), on 18 October 1990, representing a considerable altitudinal range extension.

COLOURFUL PUFFLEG *Eriocnemis mirabilis*

This rare hummingbird is known only from the type locality, on the western slope of W Andes in P. N. Munchique, Cauca, where it was discovered as recently as 1967 (Meyer de Schauensee 1967), and it remains little known (Hilty & Brown 1986).

Two attempts were made at locating this species, and on 17 April 1987 observations were made of a male and two females at or near the type locality. All individuals were observed feeding low, <2 m up on tiny yellow tubular flowers, and occasionally perched 4 m up on exposed branches at the edge of the trail. Females called a persistent high-pitched *sip*. The male was silent except for its rather loud wing-beats. The species is known from 5 specimens and was regarded as an IUCN/ICBP Red Data Book species (as defined by Collar & Andrew 1988).

SOOTY-CAPPED PUFFBIRD *Bucco noanamae*

This *Bucco*, endemic to the Pacific lowlands of NW Colombia, is known from only a small number of specimens and sight records (Haffer 1975, Rodríguez 1982, Dunning 1988). Haffer (1975) located, and collected, this species only twice in 4 years fieldwork in NW Colombia.

A single bird was flushed low from roadside vegetation to an exposed horizontal branch 3 m up near Istmina, Chocó, on 17 October 1990. The bird was confiding and did not fly off when a truck passed by; several photographs were obtained. It remained silent and peered around in typical *Bucco* fashion, eventually disappearing into dense second growth opposite a small banana plantation. The species is currently included in the IUCN/ICBP 'near-threatened species list' (as defined by Collar & Andrew 1988).

FIVE-COLOURED BARBET *Capito quinticolor*

A pair were observed and photographed near Santo Milagrosso, *c*. 60 km S of Quibdó, Chocó, on 16 October 1990. They were rather confiding, foraging from sub-canopy down to 2.5 m at humid forest edge and loosely associated with a pair of Masked Tityra *Tityra semifasciata*, which they eventually followed from tree to tree into very disturbed humid forest. The call, previously undescribed, is a low-pitched, hollow, rolling trill lasting 3–4 sec. This poorly known Colombian endemic of the Pacific lowlands has been seen at several localities near Quibdó (Hilty & Brown 1986) and was included in the IUCN/ICBP 'near-threatened species list' (as defined by Collar & Andrew 1988).

SCALED PICULET *Picumnus squamulatus*

One female was observed in roadside scrub near km 53 on the Guadalupe-Florencia road, near the Huila/Caquetá border, on 4 April 1987, and at the same location on 26 August 1989 (DW and RMcC unpubl.). These sightings represent a range extension of *c*. 240 km to the SW of the Macarena Mts, S Meta, previously thought to be the southern range limit of this species (Hilty & Brown 1986).

LESSER HORNERO *Furnarius minor*

F. minor is known from 1 Colombian specimen, 1 nest building record, and sight records from Isla Corea, Isla Mocagua and near Puerto Nariño (Hilty & Brown 1986, DW and RMcC unpubl., and BOU in prep.). It is restricted to river islands, where it occurs in early successional growth and grassland, replacing the widespread Pale-legged Hornero *F. leucopus*, which occurs sympatrically in the forested portions of these islands.

The species was found to be common near Puerto Nariño in September 1990. Its song is similar to that of *F. leucopus* but is shorter, flatter in tone, and ends in an abrupt trill.

WHITE-BELLIED SPINETAIL *Synallaxis propinqua*

First discovered in Colombia by DW, RMcC and BOU (in prep.) near Puerto Nariño on 17 August 1989. In late September 1990, the species was found to be very common at the same locality, mainly inhabiting grassland, and to a lesser extent successional growth, where it was occasionally seen walking on the ground. The call is a short, rapid series of notes, like the noise made by a fishing reel, often followed, after a pause, by the song which is a slower descending series of notes.

RED-FACED SPINETAIL *Cranioleuca erythrops*

A single bird observed at *c*. 1050 m on C. Tacarcuna, on 10 October 1990, represents the first record from the Colombian side of the Darién Gap. The species is reported to be fairly common in the highlands of E Darién, Panama (Ridgely & Gwynne 1989).

POINT-TAILED PALMCREEPER *Berlepschia rikeri*

A single individual was located *c.* 10 km N of Leticia, Amazonas, in a small grove of palms on 28 February 1987. It was approachable and rather confiding as it picked and gleaned palm leaves, especially the undersides, and searched the trunks from 1.5 m to sub-canopy *c.* 8 m up. It visited three palm groves in the course of *c.* 20 min.

On 5 August 1989 DW and RMcC observed the species in the same palm groves and about a month later the BOU (in prep.) observed a pair copulating at this locality and another individual 1 km away. Prior to these observations the species was unrecorded in Colombia.

SLATY ANTWREN *Myrmotherula schisticolor*

A male and female were observed at *c.* 800 m on C. Tacarcuna on 10 October 1990. The species is previously unrecorded from the Colombian side of the Darién Gap and is considered locally uncommon in Panamanian Darién (Ridgely & Gwynne 1989).

OCHRE-STRIPED ANTPITTA *Grallaria dignissima*

This antpitta was known in Colombia from a specimen taken in September 1966 at San Miguel, Putomayo (Hilty & Brown 1986), until discovered by FL and BOU (in prep.) at P. N. Amacayacú, Amazonas, in January 1989. We found this to be a particularly timid *Grallaria* at Amacayacú where one or two were heard daily in September 1990. The song is a mournful 2-note whistle *hoo-huooo*; the second note slides downscale, and the phrase is repeated at 10–14 sec intervals. The species walks, and runs, on the floor of humid *terra firme*, often near stream courses, and responds well to playback, but keeps its distance, usually allowing the observer only fleeting glimpses.

TACARCUNA (PALE-THROATED) TAPACULO *Scytalopus panamensis*

This species was found to be common between 1050 m and 1200 m on C. Tacarcuna in October 1990. Typical views were brief as birds flushed, often climbing briefly or skirting dead fallen trees, at damp forest edge. The main vocalization heard was a strident *tuh tu-tu-tu-t* lasting *c.* 1.5 sec, occasionally with a very short hard sixth *t* note, and repeated at *c.* 1.5–3 sec intervals for up to 15 repetitions. This was thought to be an alarm call, although birds responded to playback, being drawn into the open on occasion.

A second vocalization, often induced by the alarm-type call of one bird and made by a second individual (female?) near-by, starts each time in the gaps between each vocalization of the first bird. The phrase begins with 5 evenly spaced introductory *dt* notes continuing into a nasal low-pitched trill and descending in pitch toward the end; the whole typically lasting 3.5 sec. This phrase is typically delivered twice during the start of the alarm series and once at the end, the latter without the introductory notes. The manner, timing and structure of such vocalization sequences, heard on several occasions, suggest a pair bond. This vocalization description is probably the first for the species as that given by Wetmore (1972) is certainly erroneous and unlike any *Scytalopus*.

The taxonomic affinities of *S. panamensis* (endemic to C. Tacarcuna and C. Malí) and *S. vicinior*, which replaces it on C. Pirre, are uncertain.

There appears to be considerable variation of vocalizations in *S. vicinior*, which may include three species (Fjeldså & Krabbe 1990), and interestingly, a presumed alarm call of the C. Pirre form described by Robbins *et al.* (1985) appears to be identical to that of the Tacarcuna birds described here.

BROWN-RUMPED TAPACULO *Scytalopus latebricola*

Vocalizations and behaviour of the nominate subspecies, endemic to the Santa Marta Mts, Magdalena, have not previously been described in the literature. On 30 January 1987, two individuals were located at *c.* 2100 m on the upper northern slope of the Santa Marta massif. Both birds gave a nasal, high-pitched *szeow* at 3–4 sec intervals, for up to 15 repetitions; presumably a contact call. Like other species of *Scytalopus*, the birds crept low in undergrowth and leaf-litter, and were mainly terrestrial, occasionally climbing mossy trunks with tangled vines 1.5 m up.

SCALE-CRESTED PYGMY-TYRANT *Lophotriccus pileatus*

Two singles were observed on C. Tacarcuna between 1000 m and 1200 m, on 9–10 October 1990, representing the first records on the Colombian side of the Darién Gap. The species is, however, reported as common throughout Panama, but with few records on the Caribbean slope (Ridgely & Gwynne 1989).

WHITE-THROATED SPADEBILL *Platyrinchus mystaceus*

A single bird was located at 1250 m on C. Tacarcuna on 9 October 1990, representing the first record from the Colombian side of the Darién Gap. The species is reported as uncommon in E Darién, Panama (Ridgely & Gwynne 1989).

LITTLE GROUND-TYRANT *Muscisaxicola fluviatilis*

The species is known in Colombia from three sight records from Isla Corea, Amazonas (Hilty & Brown 1986), sight records from the downstream part of Isla Mocagua and an individual trapped and photographed near Puerto Nariño in July 1989 (DW, RMcC, BOU in prep.), where we also recorded a single bird which frequented a deep mud gulley and adjacent riverbank on 30 September 1990.

AMAZONIAN BLACK-TYRANT *Knipolegus poecilocercus*

One was observed, in a small riverside bush, at Quebrada Matamatá, P. N. Amacayacú, Amazonas, on 23 September 1990. It sallied into the water up to 10 times in *c.* 3 min and appeared to be bathing rather than flycatching; a preening session followed. A notable feature of the sallies was the loud whirr of the wings. In both sexes the outer 3 primaries are pointed (Sick 1984).

This local species is known in Colombia from two specimens taken in C Meta and E Vichada, four sight records near Leticia (Hilty & Brown 1986), and several sight records of females close to Quebrada Matamatá, P. N. Amacayacú, in January 1989 (BOU in prep.).

CITRON-BELLIED ATTILA *Attila citriniventris*

One was located and photographed in a relatively open area of humid *terra firme* forest at P. N. Amacayacú, Amazonas, on 24 September 1990, representing the first record of the species in Colombia. It was observed intermittently for about an hour and was active mainly in mid-strata, *c.* 10 m up, very occasionally dropping down to 6 m, or more often rising to the sub-canopy *c.* 16 m up. Its general behaviour, typical of the genus, varied from being very active in repeated sallies for insects to sitting still and lethargically peering around, once on a hanging liana.

BEAUTIFUL JAY *Cyanolyca pulchra*

This species, endemic to the Pacific slope, is described as rare and local, occurring from the headwaters of the Río San Juan southward (Hilty & Brown 1986), and is regarded as an IUCN/ICBP Red Data Book species (as defined by Collar & Andrew 1988). It is resident and seen with regularity at R. N. La Planada (many sight records). On 28 October 1990 a group of 3 were observed at this locality, on a cloud forest ridge, at *c.* 2000 m. Vocalizations included a grating call, given in loose pairs or more continuously when excited, and a double *click* followed by a rising whistle, repeated immediately by a single *click*-whistle. This phrase was common and repeated up to four times. Birds responded immediately to playback. One individual was observed mobbing a Plate-billed Mountain-Toucan *Andigena laminirostris* by flying into it deliberately.

SOOTY-HEADED WREN *Thryothorus spadix*

On 11 October 1990 two individuals were observed collecting nest material at *c.* 650 m at C. Tacarcuna. The nest itself was a mossy clump located 3 m up at forest edge and the record is the first from the Colombian side of the Darién Gap. In Panama the species is known from C. Pirre and has also been recorded on C. Tacarcuna and C. Quia; it is described as inconspicuous and uncommon (Robbins *et al.* 1985, Ridgely & Gwynne 1989).

On 26 August 1987, a sight record of two individuals below Junin, Nariño, at *c.* 900 m, confirms a sighting by R. Ridgely in 1976 and indicates that the species undoubtedly occurs in NW Ecuador, where it has yet to be recorded.

BAND-TAILED OROPENDOLA *Ocyalus latirostris*

Two individuals of this small, slim oropendola were seen flying across the extensive flood plain at Puerto Nariño, Amazonas, on 29 September 1990. The species can be considered uncommon in Colombia, where it is known from a specimen and sight records at Quebrada Arara, Quebrada Tucuchira and adjacent Isla Santa Sofía III, Amazonas, and, more recently, from P. N. Amacayacú where the species is uncommon inside *terra firme* and was considerably more common in mixed icterid flocks along the Rio Cotuhé in July/August 1989 (RMcC, DW, and BOU in prep.).

PALM WARBLER *Dendroica palmarum*

A single bird in immature/non-breeding plumage was observed for 20 minutes at the Turbo airstrip, N Antioquia, on 13 October 1990. This represents the first record of the species in both mainland Colombia and South America (Ridgely & Tudor 1989). The bird was mainly terrestrial and was observed on both the grass verge of the runway and on the tarmac itself, perching occasionally on several low fences. It continually wagged its tail whilst walking. The bird was very confiding, allowing approach to within *c*. 6 m. We were refused permission to photograph the bird by military officials at the airport.

This migrant species winters from central U.S.A. to Honduras and the Greater Antilles, where it is an abundant visitor to Cuba (M. Sulley pers. comm.). Its occurrence in Mexico, outside the Yucatan Peninsula and its adjacent islands, is based on a few sight records and a specimen (Hubbard 1972). It is a rare, but perhaps regular, winter visitant to Costa Rica and Panama (Ridgely & Gwynne 1986), and there are records from the Colombian islands off the coast of Nicaragua (Paulson *et al*. 1969, Russell *et al*. 1979, Hilty & Brown 1986).

WILSON'S WARBLER *Wilsonia pusilla*

An adult was observed in low to mid strata (1–5 m up) below the ridge of C. Tacarcuna, at *c*. 1250 m, on 9 October 1990. From a distance of *c*. 10 m it was observed intermittently for *c*. 15 minutes at the edge of a small clearing, where it was seen hawking actively and hover-feeding.

This record is of particular interest as the species has not been previously recorded from South America or from Darién, Panama, and is known from only 3 sight records as far east as central Panama; it mainly migrates as far south as the Chiriquí region of western Panama, where it passes the northern winter in large numbers (Ridgely & Gwynne 1989).

SLATE-THROATED REDSTART *Myioborus miniatus*

Four and six individuals were observed on 8 and 9 October 1990 respectively between 800 and 1250 m on C. Tacarcuna. The species is reported as rather uncommon in the highlands of E Darién, Panama (Ridgely & Gwynne 1989), although our observations on the Colombian side of the border, where the species is previously unreported, would appear to indicate otherwise.

GREY-THROATED WARBLER *Basileuterus cinereicollis*

One individual was observed in a remnant humid forest patch on the eastern slope of the Perijá Mts, Cesar, between Manaure and Cerro Pintado, on 13 February 1987. The bird kept to within *c*. 1.5 m of the ground in rather sparse but tall (*c*. 1.5 m) undergrowth in an area of well-spaced trees, where it responded well to 'pishing'. The species may now be rare in much of its range due to habitat loss (Hilty & Brown 1986) and is regarded as an IUCN/ICBP Red Data Book species (as defined by Collar & Andrew 1988).

SPECKLED TANAGER *Tangara guttata*

Two individuals were observed on 8 October, and 6 on 10 October 1990 at *c*. 800 m on C. Tacarcuna at forest edge. The species is previously unreported from the Colombian side of the Darién Gap though fairly common in eastern Darién, Panama (Ridgely & Gwynne 1986).

SILVER-THROATED TANAGER *Tangara icterocephala*

Observations of a single bird at *c*. 800 m and 2 individuals at *c*. 1150 m on 8 October 1990, and 2 at 1250 m on 10 October 1990, on C. Tacarcuna are the first records from the Colombian side of the Darién Gap. The species is common and widespread in Panama (Ridgely & Gwynne 1989).

GREY-AND-GOLD TANAGER *Tangara palmeri*

One was observed on C. Tacarcuna at *c.* 700 m on 11 October 1990 at the edge of a remnant forest patch. The species is reported to be rare to locally uncommon in Darién, Panama (Ridgely & Gwynne 1989), and is previously unrecorded on the Colombian side of the Darién Gap.

GREEN-NAPED TANAGER *Tangara fucosa*

One was observed at the headwaters of the Río Tigre at *c.* 1220 m, just below the ridge of C. Tacarcuna, on 8 October 1990. The bird was located in a low bush at the edge of a trail in elfin forest where it associated with a group of 6 Tacarcuna Bush-tanagers *Chlorospingus tacarcunae*. The bird was observed for 2 minutes in light drizzle, at a distance of *c.* 6 m.

The species is known from Cerro Malí and Cerro Pirre (Wetmore *et al.* 1984), where it was seen in about one third of the mixed-species flocks encountered above 1400 m (Robbins *et al.* 1985), and more recently has also been recorded from C. Tacarcuna (Ridgely & Gwynne 1989). It has not been previously recorded in Colombia, but was to be expected (Ridgely & Gwynne 1989); the sighting represents the first record for South America. The species is currently placed in an IUCN/ICBP 'near-threatened species list' (as defined by Collar & Andrew 1988).

BLACK-AND-GOLD TANAGER *Bangsia melanochlamys*

Nothing has been published on the natural history of this species, endemic to two small areas in west-central Colombia (Isler & Isler 1987). On 31 August 1987, an individual was located inside humid forest on the western slope of Cerro Tatamá, Chocó/Valle/Risaralda border at *c.* 1500 m above Todo La Fierra. The bird was initially found *c.* 10 m up in sub-canopy on an exposed bare branch where it appeared lethargic and relatively inactive for *c.* 5 minutes. It then joined a large mixed-species foraging flock which included Red-headed Barbet *Eubucco bourcierii*, Scaly-throated Foliage-gleaner *Anabercerthia variegaticeps*, Ochre-breasted Tanager *Chlorothraupis stolzmanni*, Yellow-throated Bush-tanager *Chlorospingus flavigularis*, and loosely associating Olivaceous Piha *Lipaugus cryptolophus* and White-headed Wren *Campylorhynchus albobrunneus*. The mixed flock stayed in the area for *c.* 15 minutes and observations of *B. melanochlamys* were obtained down to *c.* 6 m as it fed, *c.* 6 m up, on clusters of red berries. It was highly manoeuvrable and once clung upside down from a stem to pluck a berry from a cluster. The call was a loud, high-pitched *keerlu* which wavered in pitch in the middle and lasted *c.* 2 sec.

The species is regarded as an IUCN/ICBP Red Data Book species (as defined by Collar & Andrew 1988).

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Geographic variation in the Scaly-breasted Thrasher *Margarops fuscus* with descriptions of three new subspecies

by Donald W. Buden

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The Scaly-breasted Thrasher *Margarops fuscus* (Müller), endemic to the Lesser Antilles (Fig. 1), has been recorded on St. Martin (sight records only), Saba, St. Eustatius, St. Kitts (= St. Christopher), Nevis, Barbuda, Antigua, Montserrat, Guadeloupe, Désirade, Marie-Galante, Dominica, Martinique, St. Lucia, Barbados, St. Vincent, the Grenadines (sight records only), and Grenada, occurring in forests, semi-arid woodlands, and in settled areas (Bond 1956, 1961, 1984). Bond (1956) considered it common generally, but less numerous on St. Vincent and Grenada, rare and local on Barbados, and accidental in the Grenadines, where observed on Union and Carriacou after the hurricane of 1898 and until 1902. Bond (1961) later considered it rare on Grenada as well as on Barbados and the American Ornithologists' Union (1983) apparently made an erroneous place name substitution in reporting it as "possibly extirpated on Barbuda and Grenada."

Cory (1892) included Barbados in a list of localities for *M. fuscus*, but Clark (1905) suggested Cory's code number 33 (=Barbados) probably was a misprint for number 32 (=Grenada), which was omitted from the list. Noble (1916) alluded to examples from Barbados, but I am unaware of any specimens that would have been available then. To the best of my knowledge, the only substantiated records from Barbados are two specimens collected in 1924, several seen near Bissex Hill and Chalky Mount in spring 1959 (Hutt in Bond 1962), another near St. John's Church in 1976 (Hutt in Bond 1977), and at least one other at Russia Gulley, St. Thomas, in October 1987 (M. Hutt *in litt.*). One of the two specimens (AMNH 325625) is labelled as a breeding male in full song with testes measuring one third of an inch (8.5 mm) and collected on the east side of Barbados at an elevation of *c.* 900 feet (274 m) by G. H. Thayer and Sinclair Clark on 18 March. The other (AMNH 325626) is labelled as a female with small ovaries collected at Bathsheba on 25 March; the data are noted on the label as having been extracted from G. H. Thayer's field notes. Both specimens probably were collected in or near the forest along Hackleton's Cliff, which I visited several times during 13–18 July 1988, but without seeing *M. fuscus*.

Müller described *Muscicapa fusca* (=*Margarops fuscus*) in 1776 based on Daubenton's Gobe-Mouche brun de la Martinique, *Pl. Enl.* 568, Figure 2—see Bangs & Penard (1920) for additional comments on this plate. Synonyms include *Turdus montanus* Lafresnaye, 1844, which is preoccupied, and *Turdus apicalis* Hartlaub, 1857, the type of which is of uncertain provenance but is not Daubenton's illustration as was reported by Bangs & Penard (1920). Hartlaub (1857) gave the locality as Senegal, which is unlikely if the specimen is indeed *M. fuscus*. Lichtenstein's (1854) list of birds in the Berlin Museum includes one *Crateropus apicalis* from Senegal, this name being a *nomen nudum*; the specimen doubtless was the type of *Turdus apicalis*. Cabanis (1874) reported that the type was acquired by the Berlin Museum from a French naturalist and was said to be from Africa. He refuted its being an African species and considered it an example of *Turdus montanus* Lafresnaye without elaborating as to how he reached that conclusion but mentioning that the Berlin Museum had no other examples. I am unable to state whether or not this specimen still exists and has been correctly identified.

Lawrence (1887) reported Scaly-breasted Thrashers from Grenada as being smaller and more extensively white ventrally than those from other islands, and he described them as a new species, *Margarops albiventris*. Cory (1888) proposed the name *Margarops montanus rufus* for the birds on Dominica, claiming them "paler" and "reddish brown instead of dark brown" compared with nominate *montanus* (=*fuscus*). But after

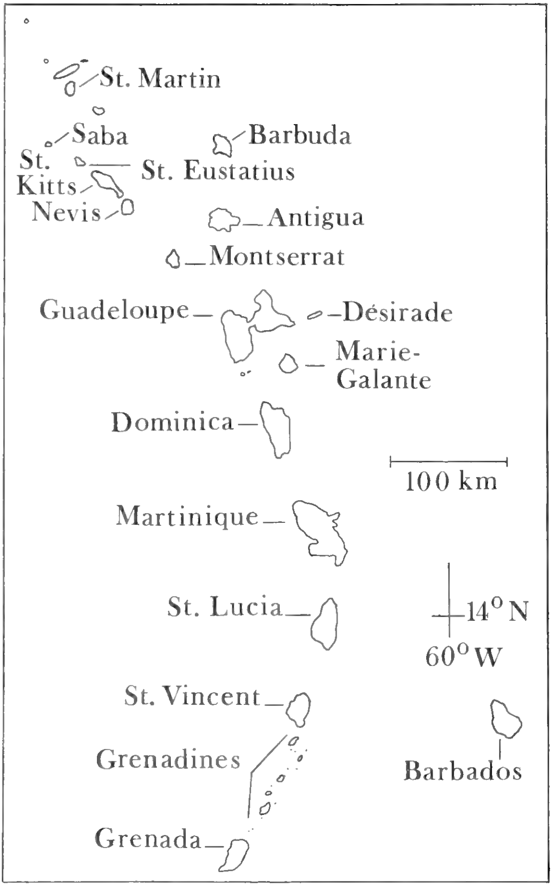

Figure 1. Map of the Lesser Antilles.

examining additional material, Cory (1891) considered the species monotypic and included *M. albiventris* in synonymy, at the same time erecting the genus *Allenia* for all of these populations. No new names were proposed subsequently, but Riley (1904) noted that specimens from Barbuda and Antigua averaged larger and were more olive and not so reddish as those from other islands. Noble (1916) reported that birds from the southern Lesser Antilles tended to be darker and smaller than those from the northern islands, and he went on to say "that if a southern race were to be separated from a northern the Guadeloupe bird would be included in the northern and the Dominica bird in the southern." In a more recent and widely accepted taxonomic interpretation, Bond (1956, 1959) considered the species monotypic and merged *Allenia* with *Margarops*.

TABLE 1

Mean, standard deviation, and sample size (in brackets) for wing, tail, and bill length measurements (mm) in samples of *Margarops fuscus*

Locality	Sex	Wing		Tail		Bill	
Saba	♂	124.8, 1.9	(5)	97.7, 1.8	(5)	18.7, 0.7	(5)
	♀	123.0, 2.0	(3)	99.4, 1.8	(3)	19.4, 1.3	(3)
St. Eustatius	♂	125.0	(1)	101.1, 3.1	(2)	18.0, 0.3	(3)
St. Kitts	♂	126.0, 3.3	(7)	99.2, 3.2	(9)	18.6, 0.5	(8)
	♀	123.8, 2.1	(5)	98.9, 4.8	(5)	18.5, 1.2	(7)
Nevis	♂	123.8, 1.5	(4)	98.1, 3.1	(4)	18.0, 0.7	(4)
	♀	124.5, 0.7	(2)	101.2, 0.9	(2)	18.6, 0.2	(2)
Barbuda	♂	125.0, 1.4	(2)	96.4, 1.8	(2)	17.8, 0.9	(2)
	♀	124.7, 4.5	(3)	99.2, 3.3	(3)	17.8, 0.7	(3)
Antigua	♂	125.4, 2.1	(5)	100.3, 2.3	(9)	17.9, 0.8	(9)
	♀	125.5, 0.7	(2)	99.4, 7.2	(3)	17.8, 0.7	(7)
Montserrat	♂	124.3, 0.6	(3)	95.0, 3.0	(3)	17.8, 0.7	(3)
	♀	125.0, 1.4	(2)	96.0, 4.3	(2)	17.1, 0.4	(2)
Guadeloupe	♂	124.0, 4.0	(8)	97.9, 2.8	(8)	17.7, 0.6	(10)
	♀	122.8, 5.2	(9)	95.4, 5.4	(11)	17.8, 0.9	(15)
Dominica	♂	117.6, 2.1	(25)	91.8, 1.6	(22)	17.5, 0.8	(24)
	♀	117.5, 3.8	(19)	91.5, 3.3	(18)	17.7, 0.8	(21)
Martinique	♂	118.5, 2.1	(4)	91.7, 1.3	(4)	17.8, 1.1	(7)
	♀	114.5, 3.4	(4)			17.1, 0.1	(3)
St. Lucia	♂	120.6, 3.4	(28)	91.4, 3.4	(25)	17.3, 0.7	(28)
	♀	119.0, 3.6	(8)	91.8, 5.1	(7)	17.5, 0.7	(8)
Barbados	♂	120.0	(1)	98.5	(1)	15.5	(1)
	♀	118.0	(1)	93.4	(1)	16.9	(1)
St. Vincent	♂	119.2, 2.4	(10)	90.8, 3.2	(9)	17.8, 0.6	(9)
	♀	115.0, 2.6	(11)	87.7, 2.8	(11)	18.1, 0.6	(13)
Grenada	♂	114.8, 2.6	(6)	87.5, 2.6	(4)	16.8, 1.0	(6)
	♀	118.0, 1.4	(4)	84.0	(1)	16.9, 1.0	(5)

I examined most of the specimens (study skins) used in previous studies along with 84 additional specimens collected by Albert Schwartz and associates on 12 different islands during 1961–1963. The Schwartz collection (AS) is now in the Louisiana State University Museum of Natural Science (LSUMZ). Other specimens I examined are in the American Museum of Natural History (AMNH), Field Museum of Natural History (FMNH), Museum of Comparative Zoology (MCZ), and the National Museum of Natural History (USNM).

The measurements, wing length (flat against rule), tail length, bill length (exposed culmen) and size of tail spot (taken on an outermost rectrix, from the tip of the feather to the proximal edge of the spot in the middle of the inner vane) are in millimetres; bills and tails were measured with dial calipers. Immatures and birds with extremely worn feathers were omitted. Colour comparisons were made largely by eye, but dorsal colouration in selected samples was measured also with an Applied Color System Spectro-Sensor II Reflectance Spectrophotometer. The names of islands in Table 1 and Figure 2 are listed roughly in geographic sequence from north to south, and the Guadeloupe samples include specimens from the island dependencies Désirade and Marie-Galante.

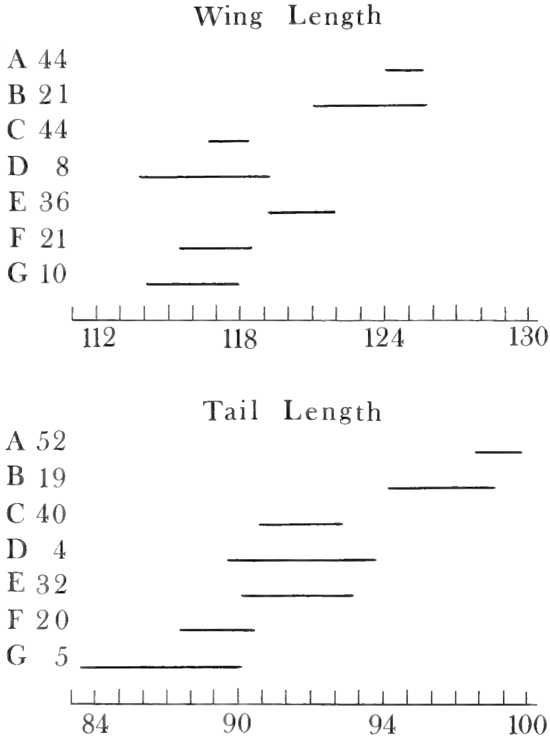

Figure 2. Ranges of 0.95 confidence for the means of wing and tail measurements (mm) in samples of *Margarops fuscus*. A = Leeward Islands (Saba, St. Eustatius, St. Kitts, Nevis, Barbuda, Antigua, Montserrat), B = Guadeloupe, C = Dominica, D = Martinique, E = St. Lucia, F = St. Vincent, G = Grenada; numbers after locality codes are sample sizes with sexes combined.

Scaly-breasted Thrashers from Guadeloupe and its dependencies northward tend to average larger than those from the south, and with no appreciable differences between sexes (Table 1). The cline is somewhat irregular for bill length but smooth for wing and tail measurements, except that the St. Lucia birds deviate in having longer wings (on the average) than do those from Martinique and Dominica to the north. In wing and tail measurements, specimens from the Leeward Islands (Saba southward to Montserrat) are similarly sized and together with those from Guadeloupe average distinctly larger than those from Dominica southward (Fig. 2). The two Barbados birds fall within the range of variation of other southern samples in most measurements, but in tail length the female exceeds the limits of all but the St. Lucia sample. The tips of the bills appear to have been broken or are excessively worn in both specimens resulting in measurements near the lower extreme for all samples combined.

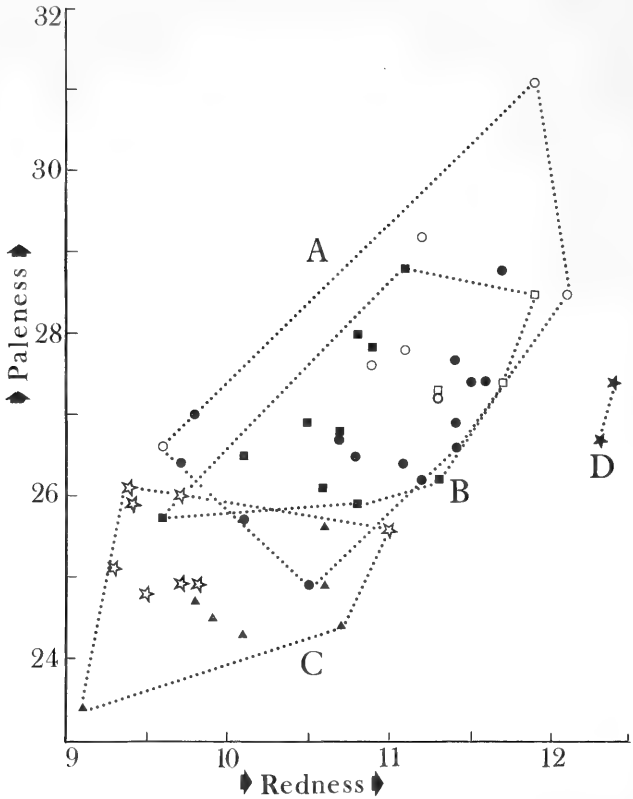

Figure 3. Plot of spectrophotometry values for dorsal colouration in selected samples of *Margarops fuscus*. A = "northern islands":—Leeward Islands (Saba, St. Kitts, Nevis, Barbuda, Antigua, Montserrat) (solid circles) and Guadeloupe (open circles), B = "central islands":—Dominica (solid squares) and Martinique (open squares), C = "southern islands":—St. Lucia (open stars), St. Vincent (solid triangles), D = Barbados.

In dorsal colouration, specimens from the northern islands tend to be paler brown than those from the south (Fig. 3). Adjacent populations overlap broadly in this character, but differences are evident when series are compared. Geographical differences in ventral colouration are much less marked and not so consistent within samples, but specimens from St. Vincent tend to be slightly darker below than those from other islands. The white spots on the tips of the tail feathers are largest in birds from St. Lucia and especially small in the two from Barbados, some wear notwithstanding.

Several specimens from different islands are distinctly more reddish-brown or rufous than others, apparently foxed. Bangs & Penard (1920) suggested that the reddish colour of Daubenton's illustration of Gobe-Mouche brun de la Martinique might be due to a change in pigment over the years, and they remarked on its resemblance chromatically to the type of *Turdus montanus* Lafresnaye from Guadeloupe, "which in its present

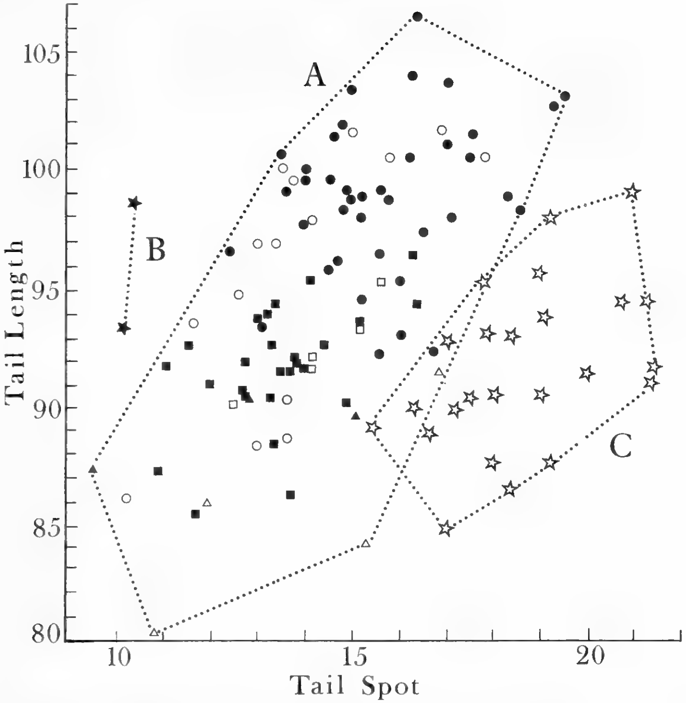

Figure 4. Plot of measurements (mm) of tail length versus size of tail spot on outermost rectrix in samples of *Margarops fuscus*. A = Leeward Islands (Saba, St. Eustatius, St. Kitts, Nevis, Barbuda, Antigua, Montserrat) (solid circles), Guadeloupe (open circles), Dominica (solid squares), Martinique (open squares), St. Vincent (solid triangles), Grenada (open triangles); B = Barbados; C = St. Lucia.

faded condition from long exposure to the light, is much redder above than fresh specimens . . ." The Lafresnaye specimen (MCZ 76370) was originally a display mount, which may account for its being somewhat paler on its presumably more exposed left side. The type of *Margarops montanus rufus* Cory (FMNH 29031) was examined for me by D. Maurer, who considered it similar in colouration to other examples of *M. fuscus* in the FMNH collection, and not noticeably rufescent. Among the 45 *M. fuscus* from Dominica that I examined, two (FMNH 29302 and USNM 90601) are apparently faded reddish-brown.

The two specimens from Barbados lack the extreme reddish-brown hue of the obviously discoloured birds, but both are distinctly more reddish dorsally than is characteristic of examples from other islands (Fig 3). The age of the specimens alone cannot account for this disparity as examples collected during the late 1800s are chromatically similar to those collected on the same islands during the 1960s. The early history of the two specimens is uncertain. Museum accession records indicate that both apparently were a part of Thayer's shipment of 74 Barbados bird specimens received by the AMNH in February 1926. But the museum archives also contain a handwritten packing slip from Thayer that reads in part: "Barbados *Allenia* (rare, local breeding resident) taken back (to be returned) for study, comparison of a *few* more Barbados & many St. Vincent specimens, and perhaps description of a new race."

Bond (1956) stated that specimens from "Barbuda, Antigua and (particularly) Barbados" are browner above than others. His inference that Barbados birds are more similar chromatically to those from the Leeward Islands (at least Barbuda and Antigua) than to those from the southern islands agrees with my observations generally and contradicts Noble's (1916) opinion that Barbados birds are more similar to examples from the south (Grenada) in being darker than those from the north (Guadeloupe). Whatever evidence (specimens?) led Noble to this conclusion was left unstated.

Thayer apparently considered Barbados birds worthy of subspecific recognition as the older of the two labels on AMNH 325625 bears the notation "Allenia montana [atlantica] proposed name G. H. T." The range of variation of *M. fuscus* on Barbados obviously cannot be adequately assessed by only two specimens, but in view of its rarity there (if still extant), additional material is unlikely to be forthcoming. As both specimens are similar to each other mensurally and chromatically and differ from others to the same degree generally as others that I consider nomenclaturally distinct differ among themselves, I propose the Barbados birds be treated as a separate subspecies under the name

Margarops fuscus atlanticus subsp. nov.

Holotype. AMNH 325625; male; Barbados, east side, elev. *c*. 900 feet (274 m); collected 18 March 1924 by G. H. Thayer and Sinclair Clark.

Diagnosis. A subspecies of *M. fuscus* characterized by a reddish brown dorsum and small amount of white in the tail.

Range. Known only from Barbados, West Indies.

Etymology. From the name "*Allenia montana atlantica*" suggested by G. H. Thayer, presumably alluding to the location of Barbados on the western edge of the Atlantic Ocean, or more specifically to the eastern (=Atlantic-facing) side of the island where the only known specimens were collected.

For the population of relatively large and pale birds in the northern Lesser Antilles, I propose the name

Margarops fuscus hypenemus subsp. nov.

Holotype. LSUMZ 142124 (original number AS 4349); male; 1.5 mi. (2.4 km) SW Lodge, St. Mary Cayon Parish, St. Christopher (=St. Kitts), West Indies; collected 18 April 1962 by Albert Schwartz.

Diagnosis. A subspecies of *M. fuscus* characterized by large size (wing length averaging 122.8 to 126.0 mm vs. 114.5 to 120.6 in other subspecies) and relatively pale brown dorsum lacking the rufescence of *M. f. atlanticus*.

Range. Known from the northern Lesser Antilles on Saba, St. Eustatius, St. Kitts, Nevis, Barbuda, Antigua, Montserrat, and Guadeloupe (including dependencies Désirade and Marie-Galante), and probably occurring on St. Martin based on sight records of *M. fuscus* by Robbins (in Bond 1984).

Etymology. From the Greek word for "leeward" in allusion to the name Leeward Islands for the Lesser Antilles north of Guadeloupe, those islands to which this race is nearly confined.

For the population on St. Lucia, I propose the name

Margarops fuscus schwartzi subsp. nov.

Holotype. LSUMZ 142125 (original number AS 3532); male; L'Hermitage, Dauphin Quarter, St. Lucia, West Indies; collected 18 January 1962 by Albert Schwartz.

Diagnosis. A subspecies of *M. fuscus* characterized by a large amount of white on the tail, the spots on the tips of the outermost rectrices averaging larger (absolutely and relative to tail length) than in other subspecies, and wing length averaging larger than in *M. f. fuscus* and dorsum slightly darker than in *M. f. hypenemus* and lacking the rufescence of *M. f. atlanticus*.

Range. Known only from St. Lucia, West Indies.

Etymology. Named after Albert Schwartz in recognition of his contributions to our knowledge of West Indian biogeography, and whose extensive collection of *M. fuscus* constituted much of the comparative material used in this study.

Specimens examined

M. f. hypenemus, 51 ♂♂, 41 ♀♀, 3 unsexed. Saba 2 ♂♂, 3 ♀♀ (AS), 3 ♂♂ (USNM); St. Eustatius 1 ♂ (MCZ), 2 ♂♂ (FMNH), 1 ♂ (USNM); St. Kitts 4 ♂♂, 2 ♀♀ (AS), 3 ♂♂ (FMNH), 2 ♂♂, 2 ♀♀ (MCZ), 3 ♀♀ (USNM); Nevis 4 ♂♂, 2 ♀♀ (AS); Barbuda 2 ♂♂, 1 ♀ (AMNH), 2 ♀♀ (USNM); Antigua 1 ♂, 3 ♀♀ (AMNH), 1 ♂ (AS), 4 ♂♂, 3 ♀♀ (FMNH), 3 ♂♂, 2 ♀♀ (USNM); Montserrat 3 ♂♂, 1 ♀ (AS), 1 ♀ (USNM); Guadeloupe 1 ♂, 2 ♀♀ (AMNH), 1 unsexed (AS), 4 ♂♂, 9 ♀♀, 1 unsexed (MCZ), 2 ♂♂, 4 ♀♀ (FMNH), 3 ♂♂, 2 ♀♀ (USNM); Désirade 1 unsexed (AS), 1 ♂ (FMNH); Marie-Galante 2 ♀♀ (AS), 1 ♂ (USNM).

M. f. fuscus, 48 ♂♂, 44 ♀♀, 2 unsexed; Dominica 7 ♂♂, 6 ♀♀ (AMNH), 13 ♂♂, 11 ♀♀ (AS), 1 ♀ (FMNH), 4 ♂♂, 3 ♀♀ (MCZ), 1 ♂, 1 ♀ (USNM); Martinique 2 ♂♂, 1 ♀ (AS), 4 ♂♂, 2 ♀♀ (FMNH), 2 unsexed (MCZ), 1 ♂ (USNM); St. Vincent 2 ♀♀ (AMNH), 4 ♂♂, 2 ♀♀ (AS), 2 ♂♂, 7 ♀♀ (MCZ), 4 ♂♂, 3 ♀♀ (USNM); Grenada 1 ♂ (AMNH), 5 ♂♂, 5 ♀♀ (FMNH).

M. f. schwartzi, 28 ♂♂, 8 ♀♀, 9 unsexed; St. Lucia 1 ♂, 2 ♀♀ (AMNH), 21 ♂♂, 2 ♀♀ (AS), 2 ♀♀ (FMNH), 3 ♂♂, 1 ♀, 9 unsexed (MCZ), 3 ♂♂, 1 ♀ (USNM.

M. f. atlanticus. Barbados 1 ♂, 1 ♀ (AMNH).

Summary

Four subspecies of *M. fuscus* are recognized—*M. f. hypenemus* in the northern Lesser Antilles to as far south as Guadeloupe and its dependencies Désirade and Marie-Galante (large size, pale to medium brown dorsum, and moderate to large-sized tail spots), *M. f. fuscus* from Dominica southward to Grenada excluding St. Lucia and Barbados (small to moderate size, medium to dark brown dorsum, and small to moderate-sized tail spots), *M. f. schwartzi* on St Lucia (moderate size, medium to dark brown dorsum, and large tail spots), and *M. f. atlanticus* on Barbados (moderate size, reddish brown dorsum, and small tail spots).

Acknowledgements

For the loan of comparative material, I thank the curators, collections managers and technicians at the American Museum of Natural History, New York; Academy of Natural Sciences of Philadelphia; Field Museum of Natural History, Chicago; Louisiana State University Museum of Natural Science; Museum of Comparative Zoology, Harvard University; and the National Museum of Natural History, Washington. I am also appreciative of the replies by museum staff to queries concerning holdings of *M. fuscus* at the British Museum (Natural History), Tring; Carnegie Museum, Pittsburgh; Florida State Museum, University of Florida; and Yale Peabody Museum, New Haven. I thank A. V. Andors for furnishing information from AMNH archives, R. A. Paynter, Jr. for permission to keep borrowed specimens at the MCZ, M. Hutt for his records of *M. fuscus* on Barbados, and Lawrence Sheftel, president, Reed Plastics Co., for use of a spectrophotometer.

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Two notable bird records from Chilean Patagonia

by François Vuilleumier, Angelo P. Capparella & Ivan Lazo

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From 7 to 30 November 1989 an expedition to southern Chile from the American Museum of Natural History (AMNH) conducted studies of speciation phenomena in Patagonian birds, especially *Geositta* (Furnariidae) and *Phrygilus* (Emberizidae) on both sides of the Strait of Magellan, Provincia de Magallanes, southern Chile (see Vuilleumier 1991a, 1991b). During that trip we also studied the rest of the avifauna, as time permitted. Two notable specimens were obtained on the mainland side of the Strait of Magellan during our survey: (1) the first specimen of *Eremobius phoenicurus* (Furnariidae) for Chile, and (2) a southward range extension of 1500 km for *Riparia riparia* (Hirundinidae). Both specimens are now catalogued at AMNH but will eventually be transferred to a museum in Chile. Tissue samples from these birds are stored at the Museum of Natural Science, Louisiana State University.

BAND-TAILED EARTHCREEPER, BANDURRILLA TURCA *Eremobius phoenicurus*

This first record for Chile is one individual (AMNH 826127) collected on 28 November 1988 *c.* 4 km southeast of O'Higgins, along the road from O'Higgins to Buque Quemado and Punta Delgada (approx. 52°18′S, 69°35′W). O'Higgins is a small village located on Route 255 about 34 km by road southwest of the town of Monte Aymond on the border between Argentina and Chile. The individual was damaged during collecting and the sex, skull ossification, and irides colour could not be determined. The damaged bill showed a black maxilla and a pale mandible with a black tip. The legs and feet were dark grey with the soles paler. The predominantly grey plumage was damaged, precluding finer analysis or preservation. The specimen consists mostly of a flat skin type of preparation with the undamaged rectrices still attached to the pygostyle. Although this specimen is an incomplete skin, the species can be identified with certainty because the colour pattern of the tail-feathers is diagnostic. The central rectrices are brown and the others are reddish chestnut at the proximal half and blackish brown at the distal half. By comparison with other furnariids at AMNH we verified that this pattern is unique to *Eremobius phoenicurus*.

The bird was collected in a patch of *mata negra* (*Verbena tridens*) in a very open, gently rolling area of grassy *Festuca* steppe (see Pisano 1977). Other birds noted in the *mata negra* included *Zonotrichia capensis* (abundant), *Lessonia rufa* (several), *Upucerthia dumetaria* (one) and *Phrygilus fruticeti* (at least one).

This species is not included in works treating the avifauna of Tierra del Fuego, including its Chilean part (Humphrey *et al.* 1970, Clark 1986), or in lists of the birds of Chile (Hellmayr 1932, Araya *et al.* 1986, Venegas 1986) or in more general distributional lists (Hellmayr 1925, Peters 1951, Meyer de Schauensee 1982, Sibley & Monroe 1990). A specimen previously attributed to the island of Tierra del Fuego was reassigned to Santa Cruz, Argentina, by Vaurie (1980: 221–222).

It is surprising that this species is not mentioned in the standard faunistic lists for Chile considering the fact that it is widely distributed in Argentine Patagonia. The possibility exists that is was observed but not collected on Chilean territory previously. In his paper on the avifauna of Tierra del Fuego and Chile, Olrog (1948: 507) stated the following: "En Punta Dungenes [sic], cerca de la frontera argentino chilena (Santa Cruz-Magallanes) en la entrada del Estrecho de Magallanes, se vío una pareja en marzo." He added: "Muy probablemente esta ave se encuentra — todavía no citada para Chile — también en otras partes de la Magallanes [sic] y en el norte de Tierra del Fuego." In his itinerary and on his map of collecting localities Olrog (1948) did not mention Punta Dungeness. He cited a male specimen collected at Puerto Gallegos, Santa Cruz, on 14 January. Presumably this is the same as Río Gallegos, a town about 60 km north of the border in Argentina. In his book on the birds of Chile, Johnson (1967: 156), citing Olrog (1948), stated that *Eremobius phoenicurus* was "Not yet recorded from Chile but virtually certain to occur in Patagonian zone of Magallanes". Our collecting site is about 85 km west of Punta Dungeness and about 85 km south of Río Gallegos.

Wetmore (1926: 253) wrote that "Near Zapala [Neuquén, Argentina] these birds were found amid patches of low thorny brush that grew on the slopes of rolling hills, where the soil was composed of sand and stones". He also stated that "they worked secretively under cover or ran along on the ground with the tail cocked at an angle over the back". One of us (F.V.) has recently been able to study *Eremobius phoenicurus* in Chubut where he found it in a variety of shrub-steppes ranging from relatively dense to quite open, but usually without grassy cover on the ground. Vuilleumier's observations closely match Wetmore's cited above. The specimen we collected in Chile was found in scrub that is patchily distributed on the leeward hillsides of the northwestern shore of the Strait of Magellan and that is physiognomically similar to the habitat it was found to occupy in Chubut.

BANK SWALLOW/SAND MARTIN, GOLONDRINA BARRANQUERA *Riparia riparia*

One adult ♂ (AMNH 826149; skull 100% ossified; left testis 2 × 1 mm) was collected 12 November 1989 from a flock of four species of swallows that were foraging very low over the mouth of the Río Santa Maria and over nearby sandbars and a gravel beach, about 2 km south of San Juán on the Brunswick Peninsula (approx. 53°40′S, 70°58′W). This area is about 65 km south of Punta Arenas. Besides the one *Riparia riparia* collected, the flock included about 50 *Tachycineta leucopyga*, 2 *Notiochelidon cyanoleuca* and 1 *Hirundo rustica*. The 12-gram individual *Riparia riparia* had moderate fat along the sides and in the abdominal cavity. No body, wing or tail moult was apparent. Its stomach contained insects. Other specimen data: irides dark brown, bill black, mouth lining yellow, tarsi and toes flesh-coloured.

This species has never been recorded south of central Chile (Valdivia) or central Argentina (Buenos Aires) (Ridgely & Tudor 1990). Most records are from east of the Andes. Therefore the most likely route that this individual took was down through Argentine Patagonia to the Brunswick Peninsula in Chilean Patagonia. Future observations are needed to determine if this species is a rare but regular visitor to the Strait of Magellan.

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The taxonomic status of *Anthus berthelotii*

by Per Alström & Krister Mild

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The taxonomic status of *Anthus berthelotii*, endemic to the Canary Islands and Madeira, has been disputed. The early authors referred it to, in succession, *A. trivialis* (Webb, Berthelot & Moquin-Tandon, 1836–44), *A. pratensis* (Vernon Harcourt, 1853) and *A. campestris* (Bolle, 1857), and finally recognized it as a distinct species (Bolle 1862). The latter author suggested that it has close affinities with both the *A. spinoletta* complex* and with *A. campestris*. Hartert (1910) argued against the proposed relationship with the *A. spinoletta* complex, but did not propose an alternative view on its systematic position. Lack & Southern (1949) and Volsøe (1951) considered it to be an old insular form of *A. campestris*. Hall (1961) argued that depending on which characters are selected as being of most importance, *A. berthelotii* could be closely related to *A. campestris* as well as to several other *Anthus* species. Most modern taxonomists (Vaurie 1959, Voous 1977, Sibley & Monroe 1990) seem to follow Lack & Southern (*op. cit.*) and Volsøe (*op. cit.*), placing *A. berthelotii* immediately after *A. campestris* in the systematic sequence. Recently, however, Bourne & Roselaar in Cramp (1988) suggested that *A. berthelotii* has closer affinities with the *A. spinoletta* complex.

The aim of this paper is to reaffirm that *A. berthelotii* is most closely related to *A. campestris*. *A. berthelotii* was studied on Gran Canaria in August 1978 and on Madeira in October and November 1986 and January 1987. Museum skins were studied in the British Museum (Natural History), Tring, Tape-recordings of *A. berthelotii*, obtained from the British Library of Wildlife Sounds and Dr. Hans-Wolfgang Helb, as well as KM's recordings, were analysed. The literature was searched for relevant data.

The term 'larger' pipits refers to *A. richardi, A. godlewskii, A. campestris, A. similis* and *A. sylvanus* of the Palaearctic pipits, whereas 'smaller' pipits refers to the other Palaearctic pipits.

Range

Anthus berthelotii is endemic to the Canary Islands and Madeira, where it is resident. The population of Madeira and Porto Santo is regarded as a separate subspecies, *madeirensis*, with slightly longer bill compared to the nominate subspecies. No other *Anthus* species breeds on these islands; *A. pratensis* and *A. trivialis*, possibly also *A. campestris*, are the only other pipits recorded (Bannermann 1963, Bannermann & Bannerman 1965, Cramp 1988). *A. campestris* (breeding in North Africa and southern and central Iberian Peninsula) is the only pipit breeding near *A. berthelotii*.

*Consisting of *A. spinoletta, A. petrosus*, and *A. rubescens*, formerly regarded as conspecific but now usually recognized as separate species (see Alström & Mild 1987, Knox 1988).

TABLE 1

Ratios of tail/wing, bill/wing and tarsus/wing (mean values) of four pipits. Bill length measured to skull. Personal measurements of museum specimens.

	Tail/wing	Bill/wing	Tarsus/wing
A. berthelotii (n=42)	0.76	0.22	0.30
A. c. campestris (n>100)	0.73	0.21	0.28
A. p. petrosus+littoralis (n>100)	0.69	0.20	0.26
A. pratensis (n>100)	0.71	0.18	0.27

Habitat

A. berthelotii prefers dry, open areas interspersed with bushes. On Madeira it is associated with open grasslands, especially on the upland plateau, but also occurs in overgrazed, dry, secondary grasslands along the coast. In the Canary Islands it is found from sea-level to about 2500–3000 m. Here it occurs in a wider variety of habitats such as open cultivated ground, shrub-covered mountain slopes, dunes, semi-desert areas of volcanic rock and in more restricted open places in wooded areas such as clearings and tracks (Bannermann 1963, Bannermann & Bannerman 1965, Cramp 1988, and personal observations).

A. berthelotii's habitat preferences match those of *A. campestris*. In this respect they differ from all other western Palaearctic pipits, except for *A. similis*.

Size and structure

A. berthelotii is the smallest Palaearctic pipit, being marginally smaller than *A. pratensis*. However, in the field it often gives the impression of being considerably larger, probably because of its proportionately long tail, tarsus and bill—a further indication of its closer relationship to the 'larger' pipits (Table 1).

Bourne & Roselaar (*loc. cit.*) state that structure of wing, bill and foot suggest closer affinities with the *A. spinoletta* complex than with *A. campestris*. We do not agree with this, since both wing-formula and foot (especially hind claw) are also very similar to *A. campestris*. The bill of *A. berthelotii* is indeed long and slender and reminiscent of that of *A. spinoletta*, although it is proportionally longer (Table 1).

In fresh plumage all of the 'smaller' pipits have their tertials rather evenly spaced, unlike all of the 'larger' species. In *A. berthelotii* the spacing of the tertials is the same as in the 'larger' pipits (Fig. 1).

Plumage and bare parts

Bourne & Roselaar (*loc. cit.*) argued that general colour, pattern on sides of head and streaking on chest suggest a closer relationship with *A. spinoletta/petrosus* than with *A. campestris*. We do not agree that the general coloration of *A. berthelotii* is closer to that of the *A. spinoletta* complex than to *A. campestris*; it is distinctly different from both. Moreover, in our opinion, the pattern on the side of the head of *A. berthelotii* is definitely closer to that of *A. campestris* than to *A. spinoletta/petrosus*. *A. berthelotii* shows a complete eye-ring, a distinct

Figure 1. Tertial spacing in 'larger' pipit (A), *Anthus berthelotii* (B), and 'smaller' pipit (C).

moustachial stripe and rather pale ear-coverts with a darker eye-stripe behind the eye, much like *A. campestris*, whereas *A. spinoletta/petrosus* show a broken eye-ring, an indistinct moustachial stripe and rather uniformly dark ear-coverts. The distinct streaking on the underside of *A. berthelotii* may seem to indicate a closer affinity with *A. spinoletta/petrosus* than with *A. campestris*, as suggested by Bourne & Roselaar. However, in *A. berthelotii* the streaks are usually smaller, darker and more sharply defined than in *A. spinoletta/petrosus*, and more confined to the breast.

The tail-pattern of *A. berthelotii* is very similar to that of *A. campestris*, the penultimate feather showing a rather long pale wedge. In *A. spinoletta/petrosus* the second outermost rectrix shows at the most a small pale wedge. The median and greater coverts of *A. berthelotii* are patterned more as in *A. spinoletta/petrosus*. In *A. berthelotii* the tarsus/toes and base of the lower mandible are flesh-coloured as in *A. campestris*, while in *spinoletta/petrosus* the tarsus/toes, and in the breeding season also the lower mandible, are usually dark brown or blackish.

To conclude, in our opinion, the plumage of *A. berthelotii* is distinctly different from all other western Palaearctic pipits although closest to *A. campestris*.

The juvenile plumage of *A. berthelotii* is clearly different from the subsequent plumages. In juveniles the mantle feathers, and to a lesser extent also the scapulars and crown, have extensive, rather clear-cut dark centres and narrow, pale fringes (looking scalloped when fresh), whereas in subsequent plumages these feathers are rather uniformly coloured, with less extensive and more diffuse dark markings and no distinct pale fringes. Moreover, the juvenile median and greater coverts, tertials and central pair of tail-feathers have more clear-cut dark centres and somewhat paler fringes/edges than in fresh adult. The juvenile plumage of *A. berthelotii* is basically similar to that of *A. campestris*, as well as to that of the other 'larger' Palaearctic pipits. In the 'smaller' species, on the other hand, the juvenile plumage is basically similar to the adult.

Moult

Unlike other Palaearctic pipits except *A. similis*, *A. sylvanus* and most *A. p. petrosus* and some *A. p. littoralis*, *A. berthelotii* lacks the partial pre-breeding moult of head and body feathers. Bourne & Roselaar suggest that this indicates a closer relationship with *A. spinoletta/petrosus* than with *A. campestris*. In our opinion the lack of a pre-breeding moult is of little taxonomic importance and merely reflects the fact that *A. berthelotii* is a resident insular bird with no need to moult in spring.

Vocalisation

The song is very simple. It consists of a single dissyllabic note, monotonously repeated approximately every second or slightly slower; *tchelee tchelee tchelee tchelee tchelee*. . . The song is very similar to that of *A. campestris*, but usually each unit is repeated somewhat faster and the tone is less melancholy. The song is very different from that of all the 'smaller' pipits of the Palaearctic, which have more varied and more complex songs, typically consisting of a long series of several different segments and usually including trills as well as more fluty notes. See Bergmann & Helb (1982) and Cramp (1988) for sonagrams and more detailed descriptions of the song of *A. berthelotii*.

Like most other pipits, *A. berthelotii* gives a variety of calls. The most common one, given both in flight and from the ground, is a single *tcheLEE* or *tchirlee*, similar to a song-unit but somewhat shorter and more explosive. Other calls are a somewhat lower-pitched *chup* and a slightly nasal *tcheep*. These calls are reminiscent of the corresponding calls of *A. campestris*, but they are distinctly different from the calls of the 'smaller' pipits.

Behaviour

The song-flight of *A. berthelotii* is significantly different from that of the 'smaller' pipits, but is very similar to that of the 'larger' pipits, especially *A. campestris*. During the song-flight the male sings while circling in deep undulations for some time, and then plunges silently to the ground. The 'smaller' pipits (except *A. gustavi*) usually ascend from a perch and then, as the peak is reached, 'parachute' to a perch or the ground; the song is usually given both on the ascent and on the descent.

Like the 'larger' pipits *A. berthelotii* does not display the characteristic antagonistic behaviour, with drooping wings and slightly raised tail, of the males of most 'smaller' pipits (except for *A. trivialis*, *A. hodgsoni* and *A. gustavi*).

Discussion

In our opinion *A. berthelotii* clearly belongs to the group of the 'larger' pipits. This is demonstrated by, e.g., (1) the tertial spacing, (2) the juvenile plumage, (3) the primitive song, (4) the undulating song-flight, and (5) the lack of the antagonistic behaviour of the males of most 'smaller' pipits.

Although our experience of *Anthus* species from the Afrotropical region is limited to studies of museum specimens and the literature, none appears to be very closely related to *A. berthelotii*. However, several characters indicate a close relationship between *A. berthelotii* and *A. campestris*. (1) The distribution of *A. berthelotii* constitutes an extension of that of *A. campestris*, thus indicating that *A. berthelotii* may be an island isolate of *A. campestris*. (2) The preference for dry, open habitats perfectly matches the choice of habitat of *A. campestris*, but disagrees with that of all other western Palaearctic pipits, except for *A. similis*. (3) The plumage is closer to that of *A. campestris* than to that of any other western Palaearctic pipit. (4) The song-flight is most similar to that of *A. campestris*. (5) The song is very similar to that of *A. campestris*.

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Notes on the behaviour of the Crimson Fruitcrow *Haematoderus militaris* near Manaus, Brazil, with the first nesting record for this species

by Andrew Whittaker

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The Crimson Fruitcrow *Haematoderus militaris* is one of the most spectacular of the large South American cotingas; yet its ecology and social behaviour are virtually unknown (Snow 1982). In the Manaus area, the first sightings of this species were made in 1979 from a 42-m tower in virgin *terra firma* forest some 50 km north of Manaus by Bierregaard *et al.* (1987), who reported initial observations of the bird's behaviour and display flight. This represented an extension of the previously known distribution in the Guianas, and Amapá and Pará in Brazil (Snow 1982). Subsequently, D. Stotz (pers. comm.) collected a specimen in Rondonia, some 1000 km southwest of Manaus.

The following observations were made over a five-year period (1987 to 1991) from the tower described by Bierregaard *et al.* (1987) or from the nearby forest reserves of the PDBFF (Projeto Dinâmica Biológica de Fragmentos Florestais). This region consists of a mosaic of *terra firma* forest and agricultural development (mostly cattle pastures) between 50 and 70 km north of Manaus. The forest here is found on nutrient-poor yellow latosols (Anon. 1978) and has a continuous, 35-m high canopy with occasional 40–55 m single emergent trees towering above the rest.

Almost all the sightings of *H. militaris* were of single birds. They were located by checking exposed perches in large open-topped emergents or by following their short, low-pitched *bock* calls. The birds were always observed in the canopy and for this reason a clearing or tower greatly improved the chances of seeing them. The call is normally repeated at irregular intervals of several seconds. Imitation of the call can sometimes bring the bird closer into the canopy above the observer. Vocal recordings by Bierregaard and Mario Cohn-Haft are archived at the Library of Natural Sound at Cornell University, and at the Instituto de Bioacústica at the University of Campinas, in Campinas, São Paulo.

As with Bierregaard *et al.* (1987), a high percentage (about 80%) of my records involved birds in adult male plumage. Only on five occasions were female-plumaged or juvenile birds seen. On one occasion an adult male was accompanied by two female-plumaged birds, and on another occasion by a single female-plumaged bird. The third sighting was of an adult male which was accompanied by a bird in a plumage similar to the juvenile plumage described by Snow (1982). The distinct vermiculated black and white tertials were conspicuous. The fourth record was of a female-plumaged bird attempting to catch a large flying insect, and the last record was an individual building a nest.

Only on the three occasions mentioned above was more than a solitary individual bird observed. The adult male and juvenile birds were observed together at 16.00 hrs on 28 March 1988. The male was seen sallying for insects from an emergent tree. It sallied for about 10–15 m at an angle of *c*. 45° in an unsuccessful attempt to catch a large unidentified flying insect, returning to the same perch as the immature bird. A few minutes later bill touching was observed. The pair (adult male and female-plumaged bird) were observed chasing each other through the canopy at the edge of a natural treefall clearing on 8 June 1987. The two birds then perched on the same branch, preened each other and touched their beaks for about a minute before they flew off calling until they were out of sight.

Snow (1982) states: "The male's courtship must be one of the most brilliant displays of all tropical American birds: to see it and describe it is a prize awaiting some future ornithologist". The first records of any display flights were recorded by Bierregaard *et al*. (1987). My two further observations provide a more detailed description of this cotinga's display.

The third record of two or more birds together involved three birds and was evidently part of the initial display. At 16.30 hrs on 14 September 1988, in the Agricultural District some 65 km north of Manaus, I was attracted to a group of three Crimson Fruitcrows by their typical calls. There were two female-plumaged birds and one male. They were perched on the edge of a 10-ha, isolated forest reserve separated on all sides from virgin forest by about 250 m of cattle pasture. The weather was still and sunny and all the birds were very close together in the top of a tall leafless tree in the corner of the reserve. The two female birds were 1 m apart and the male some 2 m below them. One of the females had an unusual plumage with the brown-black of the back extending onto the nape; the rest of the plumage was typical (black wings and tail, crimson body feathers). The male bird was puffed up with his specialized elongated feathers all erect, moving his head from side to side. He then held his head motionless at an angle with one eye fixed on the two birds above him, while the bird in typical female plumage moved closer to the other female. As the male displayed the latter bird flew off, calling once as it flew to the adjacent continuous forest. This bird was moulting its primaries. The male continued in its pose, opening his beak while moving his head from side to side. After about 6 minutes the female which had remained flew off over the clearing in the same direction as the first bird. The male returned his feathers to normal, and hopped around a little in the branches before also leaving silently across the clearing some 9 minutes later.

On 5 September 1988 the initial preparations for the display flight were observed at the Manaus observation tower. I saw a bird in male plumage at one of the regularly used perches in an emergent lecythidaceous tree. For some time it remained motionless in a partially exposed position. At 08.45 hrs it puffed out its very elongated upper breast feathers and erected its crest feathers; it started looking around more alertly, and over the next 10 minutes puffed up and erected its plumage five times. It then flew some 200 m over the canopy in its typical undulating, woodpecker-like flight to another emergent tree of the same species, some 80 m from the tower. As it arrived, the bird performed a stall above the perch enabling it to drop more slowly some 50 cm, landing with its crest erect. On a later occasion, as the bird returned to its perch it again rose up in a stall and dropped toward the perch, but this time flapped up again above the perch into a final stall before alighting. It then hopped about the small branches in the emergent tree, moving its head from side to side.

The bird performed a display flight at 09.03. It climbed steadily at an angle of about 50–60° with its neck extended and wings beating rapidly with deep forceful wing-beats almost completely below the plane of the body. When it reached about 30 m above the tree-top it started a slow descent. During the descent the bird held its wings open above the horizontal in a v form, the tail was fanned out to act as a brake, and all its crown, upper and lower back and breast feathers were puffed out. This made the bird look rather like a great crimson rugby ball. As it reached the level of the tallest emergents it began a slow spiral down into the forest and out of sight.

Shortly after 09.12 the bird was relocated on one of its regular perches. During the following few minutes it appeared very agitated, changing perches several times and puffing out its breast feathers. At 09.26 it took off on another display flight as before, but on the descent it glided almost horizontally through the canopy for some 50–80 m before relaxing its plumage and returning to its undulating flight pattern. It landed about 200 m away in another emergent.

At 08.55 the next morning we again observed the display flight. One display, from leaving the perch on the upward climb to the landing, was timed and took 24 seconds. Again at 09.16 and 09.20 the bird was seen descending from display flights above different emergent trees. During these observations no other birds were seen and no vocalizations were heard.

At 13.00 on 4 April J. Stratford (pers. comm.) observed an adult male bird flying over the road and above the canopy of the *terra firma* forest near the reserves. Its flight pattern was noted as very unusual; it was flying in a normal horizontal plane but its body was held in vertical position, with the tail spread and the upper tail-coverts all erect and moving in the wind as the bird passed by. The bird then reverted to a normal flight pattern and flew into the forest and out of sight.

The diet of this species is still poorly known. During my field work I observed on several occasions individuals sallying for large flying insects, often looking clumsy in the attempt but nonetheless with success. Bierregaard *et al.* (1987) also recorded this from the tower on one occasion. R. Ridgely and G. Tudor (pers. comm.) also observed a sub-adult bird catching two cicadas in the canopy. The bird collected in Rondonia had only insects in the stomach (D. Stotz pers. comm.). The other two stomach contents reported by Snow (1982) also only contained insects.

There is nothing recorded about the nesting of *H. militaris*. At 07.25 hrs on 2 September 1991 repeated vocalizations brought my attention to the presence of a female-plumaged bird in a large tree on the edge of a 100-ha isolated forest reserve. The bird's plumage was identical to the female seen on 14 September 1988, with the brown-black extending onto the nape. She was shuffling about in a broody manner in a slight hollow formed by a fork on a horizontal branch in the centre of the tree some 20 m high. She seemed to be arranging what I assumed to be a nest although nothing was visible from my position.

At 07.30 the female flew off silently over the clearing to some other trees along a stream some 250 m away. She returned at 07.50 directly to the nest site, making just one short vocalization. Again she shuffled about, sitting in a brooding position on the nest-site arranging something, although no nest-material was seen in the bill. During the next 3 minutes she called three times before leaving by swooping down into the cover of the nest tree and then off over the clearing in typical undulating fashion. She landed in an emergent tree before being lost to sight in the corridor of forest bordering the stream.

At 08.04 the female returned to a dead tree 20–30 m from the nest-site, where she called three times before flying to the nest. Again no material was visible. This time she move in a counterclockwise direction while sitting on the nest with her bill open, apparently arranging the nest-material. She flew off silently into the 100-ha reserve at 08.06. At 08.55 and 09.25 she visited the nest and called once; on both occasions she clearly had nest-material in her beak, apparently tiny rootlets and maybe a little mud. She settled onto the nest-site, shuffled around, arranged the material, and wiped her bill several times on the edge of the nest. On the second visit she remained standing up in the nest, and with her wings held open in a horizontal position she did one and a half clockwise rotations in the nest, pushing down the nesting material with her feet. Then she flew off over the clearing calling twice.

Further observations were made some 30 days later but there was no evidence of a bird in the vicinity of the nest, but only in the 100-ha reserve where a bird was heard to call. During a three-month ornithological survey of this 100-ha isolated reserve I recorded the species 12 times, mostly by vocalizations; only on two occasions were birds seen.

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On the status of the Christmas Island sandpiper, *Aechmorhynchus cancellatus*

by Michael Walters

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Introduction

Two species of sandpiper have been named and ascribed to the genus *Aechmorhynchus*, *Tringa cancellata* Gmelin, 1789, and *T. parvirostris* Peale, 1848. The first is known only from the lost type, considered to have been collected on Christmas Island, Pacific Ocean, on 1 or 2 January 1778 during Captain Cook's last voyage. This specimen was figured by William Ellis in a painting [no. 64] in the Natural History Museum, London. The accepted date of collection is presumably based on the fact that Ellis's painting was dated 1778, and Cook left the island on 2 January. No other specimens have ever been seen on or around Christmas Island. *T. parvirostris* was described by Peale on the basis of specimens collected by the U.S. Exploring Expedition in the period 1838–42 in the Tuamotu Archipelago. It had not been seen for a number of years prior to its rediscovery by the Moser Expedition 1899–1900, and subsequently by R. H. Beck in 1921. The problem is whether the Christmas Island population was of the same, or a different, taxon to that of the Tuamotos. (Throughout this paper the name *Aechmorhynchus* will be used, although the genus has recently been considered congeneric with *Prosobonia* (Zusi & Jehl 1970).)

Stresemann (1950) and others who have examined Ellis's plate of the Christmas Island bird concluded that it was probably the same as the Tuamotu population, and this was accepted by Greenway (1958) without further enquiry. Seebohm (1888) merged *parvirostris* in *cancellatus*, but Townsend & Wetmore (1919) separated them on the grounds that the description of the latter by John Latham (1785) states that the bill was one inch (26 mm) long and the underparts were barred, whereas of the four available specimens of *parvirostris* the longest bill was only 18 mm and the underparts were unmarked. Zuzi & Jehl (1970) were of the opinion that these distinctions do not in fact apply, on the grounds that bill lengths given by Latham are often imprecise and therefore the length of one inch does not necessarily indicate a longer bill in *cancellatus*. Similarly, barring on the underparts of *parvirostris* is variable and cannot therefore be used as a distinguishing feature. They therefore dismiss *parvirostris* as a synonym of *cancellatus*. However, it is not as simple as that.

The problem

Christmas Island is approximately 2000 miles from the Tuamotus. It seems unlikely that two sedentary populations of a sandpiper would occur on these two groups, and on no others in the South Pacific, without having diverged to some extent. There are therefore several possibilities to be considered: (1) The two populations were identical. (2) The two populations differed. (3) There never was an endemic population on Christmas Island, the single specimen was in fact a vagrant. (4) The locality is an error, and the specimen was not collected on Christmas Island at all, but in the Tuamotos. (5) The species formerly occurred widely in the South Pacific, but in historic times had been rapidly decimated, and was practically extinct on Christmas Island by the time of Cook's visit. Possibility 5 (which follows on from 1) is not provable except by the discovery of bones on Pacific islands which could be attributed to this taxon. 3 seems unlikely, but again is not capable of proof. 4 can also be dismissed, as Cook did not visit the Tuamotos on the third voyage.

The specimens

The type of *cancellatus* was brought back safely to Britain and passed into the Banksian Collection where Latham saw and described it as the "Barred Phalarope":

> Length 7 inches and a half. Bill one inch, black: the feathers on the upper parts of the bird brown, edged with white: under parts white, transversely barred with dusky: quills dusky, with the ends brown, and the margins and tips very pale: tail the same, spotted on both webs with white: legs dusky. Inhabits Christmas Island. In the collection of Sir Joseph Banks.

This description was the basis of Gmelin's name. The subsequent fate of the specimen is unknown. Lysaght (1959) says that the length of the bird as given by Latham ($7\frac{1}{2}$ inches) agrees neither with Ellis's plate nor with a manuscript description by William Anderson.

Ellis's painting of *cancellatus* depicts a bird closely related to *parvirostris* but with shorter hind toes. The underparts are much paler than in the five NHM specimens of *parvirostris*, but the most striking difference is the head pattern: *parvirostris* has a white superciliary stripe, very thin or absent in front of the eye and most prominent behind it; *cancellatus* has no white stripe behind the eye, but a very broad prominent one in front of it.

Peale's (1848: 235–6) description of *parvirostris* states that the bill is green, black at the tip, the legs olive green and the irides brown. The females paler than the males. Peale found it common on Dog Island, rare on Raraka. He said that there is a superciliary line which is nearly white. Cassin (1858) revised Peale's work a decade later, and added plates which were intended to (but did not) accompany the earlier work. His plate of *parvirostris* depicts a nondescript sandpiper with no very distinctive features. There is a faintly pale area before, behind and under the eye, with a faint dark streak from the eye to the base of the bill, the throat is pale with barring commencing on the chest and continuing on the flanks. The back and wings are brown with pale edges to the feathers, the primaries have less pale edges. The tail feathers are brown with some white barring on the edges of the outer webs. The descriptions of Peale and Cassin do not disagree with the plate.

P. R. Lowe (1927) examined and discussed *parvirostris*. He pointed out that the flying capacity of *parvirostris* had not degenerated at all; it had full powers of flight, which Lowe considered remarkable for a wader which was sedentary and confined to a single archipelago. This suggests the possibility that the bird was formerly more widely distributed. Lowe suggested that because the Bristle-thighed Curlew *Numenius tahitiensis* was first collected by Peale in the same place as *parvirostris*, the latter may originally have had a similar distribution. But there is no known instance of a migratory bird abandoning migration and settling down to a sedentary existence in one of its two abodes. Lowe considered that the characters of *Aechmorhynchus* were primitive and rather ralline in nature, and suggested that it was from an older group than most of the rest of the waders. This view has not been generally accepted.

The islands and their ornithological history

Christmas Island is a low coral lagoon, discovered by Captain Cook on Wednesday 24 December 1777. He remained there till 2 January 1778, naming the island for the season (Findlay 1886). The island is 35 miles long, and 14 miles wide at its greatest width. The lagoon is very shallow, and has now largely silted up, leaving a large tidal basin at the western (leeward) side, an area of islets in the middle, and a large flat area with many small lakes in the east. The island is very low (formerly no more than 10 feet above sea level) but there are now a number of sand dunes up to 40 feet high. The water table is often very near the surface, which makes travel hazardous, and causes flooding in wet weather. The soil is calcareous sand, often covered with mud, or a hard pan or crust of coral mud. The island is only 2 degrees north of the equator, and there is little seasonal change in climate (Gallagher 1960). When discovered, the land was covered with stunted bushes, and a few palm trees. Cook planted yams and melons. He also dug without success for water, but subsequent visitors found that very inferior water could be obtained (Findlay 1886).

There is apparently archaeological evidence that the island was visited in early times, but there is no indigenous human population (Gallagher 1960), and the island was certainly not inhabited at the time of Cook's visit. There is difficulty in interpreting the changes to the fauna that may have occurred since then. Remarkably little has been written about the island, particularly in the early years, and there is no further account until that of Bennett (1840). Cook commented on the birds as follows:

> Under the low trees above-mentioned, sat infinite numbers of a new species of tern, or egg-bird. These are black above, and white below, and with a white arch in the forehead [Sooty Terns]; and are rather larger than the common noddy ... There were also a good many common boobies, a sort that are almost like a gannet [Blue-faced Booby]; and a sooty or chocolate coloured one, with a white belly [Brown Booby]. To this list we must add men-of-war birds; tropic birds; curlews; sandpipers; a small land-bird like a hedge sparrow [the endemic warbler]; land crabs; small lizards; and rats.

F. D. Bennett visited the island in the whaling ship *Tuscan* in May 1835, and gave an account of the island in his travels (1840). Unfortunately King (1955) appears to have totally garbled Bennett's account, claiming that the latter saw sooty terns, pure snow white petrels, frigate birds and petrels, among others. Bennett's account mentions none of these. Furthermore the "quail" listed briefly by Bennett is interpreted by King as referring to wintering Golden Plover, but this seems unlikely, as Bennett specifically states that it is a land bird. It may therefore have been a small rail, totally unknown to science. King's account is repeated by Gallagher (1960). Much more to the point, Bennett makes no mention of any endemic sandpiper, which had probably disappeared by that time, possibly a victim of the rats which were already present in Cook's time. This, however, cannot be proved. It is not clear what species of rats are here involved. Gallagher saw at least two species (but did not trap any), a small grey one which he thought was probably the Polynesian Rat *Rattus exulans*, and another large rufous one which he did not identify, but which may have been the Brown Rat *Rattus norvegicus*. (Mrs. Elizabeth Schreiber, pers. comm., advises me that this larger species of rat is no longer to be found on the island.) It is most likely that the rat present when Cook arrived was *exulans*, introduced by the Polynesians, which seems to do relatively little damage to bird populations. There is as yet no known instance of the extinction of any bird species as a result of predation by *R. exulans*. Atkinson (1985) indicates that there is no evidence for the existence of any rat other than *R. exulans* on any island in the central Pacific prior to 1850; after that date all three species (*R. exulans, R. rattus* and *R. norvegicus*) were widely, but irregularly, distributed. Atkinson does not specifically mention Christmas Island, and no information seems to be available on dates of rat introduction.

King's assessment of Bennett's account is so poor that he lists "other terns" and suggests that these are "probably noddies". Not only are these terns quite clearly the Blue-grey Noddy *Procelsterna cerulea* but King has overlooked the fact that Bennett gave a detailed description of them and actually named this species for the first time, type locality Christmas Island! As Bennett's account is of some importance in establishing his accuracy, it is here discussed. Bennett's ship reached Christmas Island on the afternoon of 6 May 1835. He describes a booby, clearly *Sula dactylatra*; the Red-tailed Tropic bird *Phaethon phoenicurus* (now *P. rubricauda*); the "snowy tern" is obviously *Gygis alba* for he describes it laying eggs on bare branches; and the Blue-grey Noddy. He also found "curlews" numerous on the coast. He is absolutely accurate in all the birds which he describes. However, the fact that he omits any mention of several species which must have been present, means that we cannot be certain that the sandpiper had died out by that time.

The next recorded visit seems to have been that of the lumber barque *J.C. Fremont* which was wrecked in the large bay on the east of the island in November 1857. In 1858, Captain Hooper examined it, reporting that a number of wrecks had occurred in that dangerous bay. He noted that the lagoon was extremely salty and that all the fish in it appeared to be dead, but remarkably preserved, and quite edible, the excessive salt appearing to act as a preservative (Hooper, in Findlay 1886).

The first ornithological visit to Christmas Island which systematically collected and reported on the birds was by Streets (1877), who visited it in a January during the course of the 1873–5 United States North Pacific Surveying expedition. He listed 9 species:

Numenius femoralis, i.e. *tahitiensis*. A few seen but not collected.
Sula piscator, i.e. *S. sula*. Sitting on eggs in January.
Sula cyanops, i.e. *dactylatra*. Breeding, one immature collected.
Fregata minor. Not breeding and not very common.
Phaethon rubricauda. Breeding. 2 specimens collected, one an immature.
Anous stolidus. Breeding.
Puffinus nativitatis. One specimen, captured on its nest.
Pterodroma parvirostris. Breeding. 2 specimens collected.

The list is interesting not only for what it includes, but for what it omits. There is, for instance, no mention of the endemic warbler.

Gallagher (1960) lists a total of 32 species recorded from the island. It is clear that the failure to mention a particular species in one of the early accounts cannot be taken as incontrovertible evidence that that species was not in fact present.

A. parvirostris is widely distributed in the Tuamotu Archipelago, and is not confined to Honden and Raraka, as was stated by earlier writers. It occurs in every type of habitat the islands afford, commonly on stretches of bare ground, and less commonly in dense pandanus thickets. Islands on which the sandpiper has been recorded include the Mangareva group, the Actaeon group southwest of Mangareva, and the central Raeffsky group (Greenway 1958). Holyoak (1973) points out that *A. parvirostris* occurs only on islands free of men, cats and rats. The Mangareva or Gambier Islands consist of an encircling coral reef enclosing five large and several smaller islands. All the islands of the group are steep and rugged, and volcanic in origin. They are fertile and have fresh water. The Amphitrite or Actaeon Islands are low wooded islands, apparently with fringing reefs, and when discovered in 1833, were uninhabited. The Raeffsky Islands are three small islands, very close together and almost connected. Honden or Dog Island when discovered in 1616 was clothed with vegetation and almost covered with water at high tide. It appears to have been uplifted since that date. It is now a coral lagoon which only communicates with the sea at very high tides. Raraka is a thickly wooded coral lagoon. Fakarava is a large coral lagoon, well vegetated and inhabited, the population in the late nineteenth century being about 190. Katieu is a low coral atoll with a lagoon. Kawahi is a low coral lagoon covered with coconut palms and bushes (Findlay 1884). Thus the sandpiper occurs both on coral atolls, similar to Christmas Island, and on high volcanic islands.

Conclusions

The available evidence does not prove conclusively the existence of a population of *Aechmorhynchus* sandpipers on Christmas Island taxonomically distinct from that on the Tuamotus. Conversely, it does not prove that such a population could not have existed. The quality of Ellis's painting, the type of *A. cancellatus*, suggests, but does not prove, that the Christmas Island specimen was different from that of the Tuamotu population (*parvirostris*). However, in my view the evidence is sufficient to say that *parvirostris* cannot unequivocally be identified with *cancellatus*, and that therefore the latter name should not (as has recently been done) be used for the Tuamotu population, which should revert to the name *parvirostris*. *Aechmorhynchus cancellatus* must remain a name of doubtful application, possibly but not certainly referring to an extinct species, formerly endemic to Christmas Island.

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Avian body weights from southern Ecuador

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This paper presents body weight data for 676 individuals of 169 species. It should be seen as a continuation of King's (1991) presentation of weights of 88 south Ecuadorean species, which to our knowledge is the only previous paper on the subject covering this region. Prior to 1989 the southernmost part of Ecuador was poorly surveyed (Bloch *et al.* 1991), and avian distribution patterns are rather complex, as two centres of endemism (the North Andean and Tumbesian) overlap in the region (Best & Clarke 1991, Bloch *et al.* 1991). In spite of several expeditions to the area in the last couple of years, the area is one of the biogeographically least understood parts of the Andes.

Data and study sites

Data were collected during 6 months (January to July) of fieldwork in 1989 and 3 months (October to January) in 1991–1992. The data from 1989 were collected solely from living mist-netted birds, while some of the data from the second period are from collected specimens. Details of the mist-netting programme in 1989 are given in Bloch *et al.* (1991). Mist-netting was carried out more or less evenly from dawn to dusk. The data have been collected from 14 different localities in the provinces of Loja and Zamora-Chinchipe of southern Ecuador. Localities surveyed (arranged in order of increasing elevation) are as follows:

Upper tropical zone: (1) Rio Bombuscara (04°08'S, 78°58'W), 1000–1300 m. Premontane humid forest. Huge forested area along the Bombuscara River in the Podocarpus National Park connected with the rest of the only remaining cohesive forested area in the Andes region of southern Ecuador. Most of the area is good primary forest with lush undergrowth and tall trees. Some smaller clearings and patches of second growth.

Subtropical zone: (2) New Sabanilla-Zamora road (04°00'S, 79°02'W), 1500–1700 m. Humid montane forest. A patch of primary forest, which is still connected to the forested areas of Podocarpus National Park. A new road is under construction in this area, and the forest is being cut to make way for it, but the area still contains patches of undisturbed forest with dense understory and a moderate cover of epiphytes. (3) Nueva Fatima (04°16'S, 79°49'W), 1750 m. Semi-deciduous montane forest. A very small forest patch (0.2 km^2) of secondary forest, consisting of tall second-growth, dense scrub and a few larger trees. (4) Quebrada Avioneta (04°17'S, 78°56'W), 1900–1950 m. Very wet montane forest. Huge forested area within the forested zone of Podocarpus National Park. Tall primary forest, with an extremely dense cover of epiphytes and some undergrowth; i.e., some scattered cleared areas. (5) East of San Pedro (04°13'S, 79°11'W), 2300 m. Semi-wet montane forest-scrub. A scrubby secondary forest with some understory in a landscape heavily disturbed by settlers. Corridors exist to better forest at higher elevation. (6) Celica I (03°57'S, 79°48'W), 2350–2400 m. Semi-humid montane forest. Rather disturbed primary forest patch strongly influenced by human activity. Less disturbed in upper parts and particularly in ravines, the intervening ridges with much shorter vegetation, in lower parts mainly with secondary growth and with large cleared and burned areas. Undergrowth partly disturbed by cattle.

Temperate zone: (7) Quebrada Honda (04°30'S, 79°07'W), 2400–2500 m. Humid montane forest. Fragmented and disturbed primary forest, with moderate epiphyte cover and undergrowth. Connected to the huge forested area of Podocarpus National Park. (8) Jatumpamba

(04°19′S, 79°52′W), 2500–2600 m. Semi-deciduous montane forest. A small forest patch of mainly secondary forest without any large trees. Understory vegetation very sparse due to grazing by cattle. (9) The farm of David Espinosa (03°58′S, 79°09′W), 2600 m. Humid montane forest. A neighbouring area to Podocarpus National Park with mixed grassland and forest. The forest has a dense undergrowth and moderate cover of epiphytes. The forest edges and the scattered thickets consist solely of secondary growth. (10) Celica II (04°01′S, 79°52′W), 2750 m. Semi-humid montane forest. A small and isolated but rich primary forest patch, with a dense undergrowth. Trees with abundant epiphytes. (11) Selva Alegre (03°32′S, 79°22′W), 2850 m. Wet montane forest. Fragmented primary forest with remarkably tall trees. In the lower parts alternating with pastures, burned areas and thickets with secondary growth. Trees in primary parts with many flowering epiphytes and also thick velvet-like cushions of moss. Undergrowth partly disturbed by cattle grazing inside the forest. Scattered openings due to selective logging. (12) Oña Capa (03°34′S, 79°08′W), 3000 m. Humid montane forest. A few hectares of disturbed primary forest. Moderate cover of epiphytes and many open spaces due to selective felling. Fringes of the forest mixed with thickets of secondary growth. (13) Acanama (03°42′S, 79°13′W), 3000 m. Very wet montane forest. Two patches separated by a ravine with cleared and grazed slopes. Patch 1: mainly secondary growth including a dense undergrowth of *Chusquea* on a small hill; i.e., central parts with tall primary, epiphyte-covered trees. Patch 2: a primary dense forest on a steep slope with reduced undergrowth, instead a mass of tangled, mossy roots in the lowest stratum; the fringe of the forest with dense thickets of *Chusquea*. (14) Cajanuma (04°06′S, 79°09′W, 2700–3200 m. Humid montane forest. Huge forested area in a valley connected to the rest of the only remaining cohesive forested area in the Andes region of southern Ecuador, Podocarpus National Park. In the lowest part (2700–2750 m) mainly secondary growth mixed with some primary forest. From 2750 m primary humid cloud-forest with some large areas with dense undergrowth of *Chusquea*. Conspicuous cover of moss and great abundance of mistletoes and epiphytes. The vegetation grades into a gnarled moss-covered elfin forest at 3000 m.

The weights

All birds were weighed with a Pesola spring balance to the nearest 0.5 g. For any category where at least five weights are available, the mean, standard deviation and range are given. For categories with fewer than five, individual weights are given. Localities where the weights were obtained are indicated by the locality number(s) after the name.

These weights include species that have small geographic ranges (e.g. *Coeligena iris, Thamnophilus zarumae, Ochthoeca jelskii, Basileuterus fraseri, Basileuterus trifasciatus, Atlapetes leucopterus*) and/or are rare and poorly known (e.g. *Pyrrhura albipectus, Galbula pastazae, Grallaricula peruviana, Myiophobus lintoni, Notiochelidon flavipes, Turdus fulviventris*).

The taxonomy of South American birds is at present under extensive revision. Some forms are being elevated from subspecies to species rank, or demoted from species to subspecies rank. Nevertheless, we follow the nomenclature and order of Meyer de Schauensee (1970), even though somewhat outdated, as it still remains the only comprehensive modern treatment of the birds of South America. However, following Traylor (1985) and the recommendation of R. S. Ridgely and P. G. Greenfield (*in litt.*) we have treated the following taxa as distinct species: *Thamnophilus zarumae* is regarded as distinct from *T. doliatus; Myrmotherula spodionota* is regarded as distinct from the lowland species *M. haematonota; Ochthoeca jelskii* is separated as a species from *O. pulchella* of Peru and Bolivia; *Vireo leucophrys* of southern Middle and South America is regarded as a species separate from the northern *V. gilvus; Basileuterus fulvicauda* is regarded as distinct from *B. rivularis*; and *Diglossa humeralis* is regarded as distinct from *D. carbonaria*.

Pyrrhura albipectus (2): ♂ 110; ♀ 98
Threnetes leucurus (1): unsexed 6, 6.5
Phaethornis guy (1): unsexed 5, 5.5, 5.5
Phaethornis syrmatophorus (4): ♂ 5.5; unsexed 6
Phaethornis griseogularis (1): unsexed 2.5
Eutoxeres aquila (1): unsexed 9.5, 11
Colibri thalassinus (6, 10): 6 unsexed 4.6 ± 0.9 (4–5.5)
Amazilia amazilia (3): unsexed 4
Adelomyia melanogenys (4, 6, 10): ♂ 4.5; 9 unsexed 3.9 ± 0.2 (3.5–4)
Heliodoxa rubinoides (4): ♀ 7.5
Lafresnaya lafresnayi (7, 9, 11, 13, 14): ♂ 5; 8 ♀♀ 4.7 ± 0.5 (4–5.5); unsexed 5.5, 6.5
Coeligena coeligena (4): unsexed 8
Coeligena torquata (7, 14): ♂♂ 8.5, 9; ♀ 7.5
Coeligena lutetiae (13, 14): 6 ♂♂ 7.7 ± 0.8 (7–9); ♀ 7.5
Coeligena iris (6, 10, 11, 13): 7 ♂♂ 6.8 ± 0.6 (6–7.5); ♀ 6.5; 17 unsexed 6.8 ± 0.5 (6–8)
Heliangelus amethysticollis (4): ♂♂ 5, 5.5
Heliangelus exortis (7, 13, 14): 9 ♂♂ 4.6 ± 0.7 (3–5); ♀♀ 5, 5; unsexed 4.5, 5, 5, 5.5
Heliangelus viola (6, 9, 10, 11): ♂♂ 5, 6.5; J 5.5; unsexed 5, 5.5, 5.5
Eriocnemis vestitus (11, 13): ♀ 5; unsexed 5.5
Lesbia nuna (5, 6, 9, 10): ♀♀ 3, 3.5, 4, 4
Metallura tyrianthina (9, 11, 13, 14): 7 ♂♂ 3.8 ± 0.4 (3.5–4.5); 8 ♀♀ 3.6 ± 0.4 (3–4); unsexed 4, 4
Chalcostigma herrani (14): ♀ 5
Aglaiocercus kingi (4): ♀ 4
Trogon personatus (12): ♀ 57
Galbula pastazae (1): ♂ 32.5; ♀ 31
Aulacorhynchus derbianus (2): unsexed 200
Veniliornis fumigatus (10): unsexed 42.5
Dendrocincla tyrannina (7): ♂ 56
Sittasomus griseicapillus (1): unsexed 18
Glyphorynchus spirurus (1): unsexed 13
Xiphorhynchus triangularis (4): unsexed 46.5
Lepidocolaptes affinis (11): unsexed 33
Synallaxis azarae (5, 9, 13, 14): JJ 15, 15.5; 7 unsexed 15.4 ± 1.0 (14–17)
Synallaxis unirufa (7, 14): unsexed 18, 21.5
Synallaxis gularis (13, 14): JJ 11, 12, 12.5; 11 unsexed 12.8 ± 0.7 (12–14)
Cranioleuca antisiensis (5, 6, 8, 10): 12 unsexed 15.4 ± 1.8 (13–18)
Margarornis squamiger (11, 13, 14): 6 unsexed 17.7 ± 0.9 (16–18.5)
Premnoplex brunnescens (4): ♂ 15; 11 unsexed 16.4 ± 1.1 (14.5–18)
Pseudocolaptes boissonneautii (11, 13, 14): 5 unsexed 49.6 ± 2.3 (46.5–52)
Thripadectes melanorhynchus (1): unsexed 38, 46
Thamnophilus zarumae (5): ♂ 23.5
Thamnistes anabatinus (1): unsexed 19.5
Dysithamnus mentalis (1): ♀ 15
Myrmotherula spodionota (1): ♂ 10
Cercomacra nigrescens (2): ♂ 16, 18.5; ♀ 17; J 15.5
Pyriglena leuconota (1, 4): ♂♂ 31, 33.5
Hylophylax poecilonota (1): ♂ 18
Grallaria rufula (14): unsexed 39
Grallaricula nana (7:) ♂ 21
Grallaricula peruviana (4): ♀ 18
Conopophaga castaneiceps (1): ♀ 25.5
Myornis senilis (13, 14): unsexed 19.5, 21.5, 23
Scytalopus femoralis (4): ♂ 25
Scytalopus latebricola (9): unsexed 18
Ampelion rubrocristatus (10): unsexed 59
Pipreola riefferii (4, 7): ♂♂ 49.5, 53; ♀♀ 43, 48.5
Pipreola arcuata (7): ♂ 119
Pachyramphus versicolor (2, 4): ♂♂ 13.5, 15
Pipra isidorei (1): ♂ 7; ♀♀ 8.5, 9
Masius chrysopterus (2, 4): ♂♂ 10.5, 10.5; ♀ 13
Myiotheretes fumigatus (14): unsexed 32

Ochthoeca fumicolor (13, 14): 5 unsexed 17.1 ± 0.7 (16–18)
Ochthoeca rufipectoralis (7, 14): 6 unsexed 11 ± 0.8 (9.5–11.5)
Ochthoeca cinnamomeiventris (4): unsexed 11, 13
Ochthoeca frontalis (14): unsexed 10.5, 11
Ochthoeca jelskii (10): unsexed 9.5, 10, 11
Ochthoeca diadema (7, 13, 14): 5 unsexed 10.7 ± 1.4 (9.5–13)
Sayornis nigricans (2): unsexed 20
Myiodynastes chrysocephalus (2): JJ 42, 42.5
Myiarchus tuberculifer (7): unsexed 20.5
Myiotriccus ornatus (1): unsexed 12.5, 12.5, 12.5
Pyrrhomyias cinnamomea (7, 11, 13): unsexed 9, 10, 10
Myiophobus phoenicomitra (1, 4): ♂♂ 12.5, 12.5; ♀ 11.5
Myiophobus cryptoxanthus (2): ♀ 8.5
Myiophobus lintoni (7): J 10
Hirundinea ferruginea (2): unsexed 31, 32, 40
Platyrinchus mystaceus (1): unsexed 7.5, 12
Tolmomyias assimilis (1): unsexed 16
Idioptilon granadense (13): unsexed 8, 8
Pseudotriccus pelzelni (4): ♂ 11; unsexed 11
Pseudotriccus rificeps (14): unsexed 11
Anairetes parulus (13): unsexed 6, 6, 6.5
Serpophaga cinerea (4): unsexed 8
Mecocerculus poecilocercus (6, 10): unsexed 7, 7.5, 7.5
Mecocerculus calopterus (3): unsexed 7, 7
Mecocerculus stictopterus (10, 11, 14): unsexed 9, 9, 10.5
Elaenia pallatangae (9, 10): 5 unsexed 15.1 ± 1.5 (13.5–17.5)
Tyranniscus uropygialis (8): unsexed 7
Leptopogon superciliaris (1, 2): ♂ 13.5; unsexed 11.5, 13.5
Leptopogon rufipectus (4): unsexed 12.5, 15
Mionectes striaticollis (1, 4): unsexed 13, 15, 15.5
Mionectes olivaceus (1): 5 unsexed 13.6 ± 1.4 (12.5–15.5)
Notiochelidon flavipes (7): ♀ 9
Cinnycerthia unirufa (7, 13, 14): ♂ 30; J 24.5; 12 unsexed 28.2 ± 2.6 (25–32.5)
Cinnycerthia peruana (4): 7 unsexed 25.7 ± 2.2 (22–28)
Cistothorus platensis (13): unsexed 12.5
Thyrothorus euophrys (7, 14): ♀ 31; unsexed 31.5
Troglodytes solstitialis (11, 14): 5 unsexed 10.7 ± 1.1 (9–12)
Henicorhina leucosticta (1): unsexed 15
Henicorhina leucophrys (1, 4, 10): 9 unsexed 14.9 ± 0.8 (13.5–16)
Myadestes ralloides (1, 4): unsexed 27, 28, 28.5, 30
Catharus fuscater (4, 10): 5 unsexed 34.6 ± 1.1 (33.5–36)
Catharus ustulatus (1, 2): 8 unsexed 28.4 ± 2.3 (25.5–33)
Turdus fulviventris (4): ♂♂ 70, 71; ♀ 69
Vireo leucophrys (6): unsexed 12.5, 13
Hylophilus olivaceus (1): unsexed 12, 12, 13
Cacicus holosericeus (14): unsexed 64
Parula pitiayumi (1): unsexed 7.5, 8
Dendroica fusca (2, 9): ♂ 10; ♀ 8.5
Wilsonia canadensis (1): unsexed 9.5
Myioborus miniatus (1, 4, 5, 6): 6 unsexed 9.8 ± 0.9 (9–11.5)
Myioborus melanocephalus (7, 13, 14): JJ 12.5, 13.5; 5 unsexed 12.0 ± 1.2 (11–14)
Basileuterus nigrocristatus (6, 7, 9, 10, 12, 13, 14): 15 unsexed 11.9 ± 1.3 (9.5–14)
Basileuterus luteoviridis (13, 14): 5 unsexed 16.1 ± 2.4 (13–19.5)
Basileuterus tristriatus (4): 6 unsexed 12.9 ± 1.2 (11–14.5)
Basileuterus trifasciatus (3, 6, 10): 9 unsexed 9.7 ± 0.8 (8.5–11); J 9
Basileuterus coronatus (4, 7, 11, 13, 14): 11 unsexed 15.5 ± 2.5 (12–20.5)
Basileuterus fraseri (3): unsexed 14
Basileuterus fulvicauda (1): unsexed 13, 13.5, 16
Coereba flaveola (1): unsexed 10, 10
Conirostrum sitticolor (13): unsexed 12, 12.5
Diglossa lafresnayii (13, 14): 6 unsexed 15.7 ± 1.5 (14–18.5)
Diglossa humeralis (9, 13): ♂ 13; J 11; unsexed 14

Diglossa albilatera (5, 6, 7, 9, 10, 13, 14): 11 ♂♂ 10.3 ± 1.1 (9.5–12.5); 5 ♀♀ 9.3 ± 0.4 (8.5–9.5); JJ 10.5, 11; unsexed 10, 10.5
Diglossa glauca (4): ♀ 11; unsexed 10.5, 12
Diglossa cyanea (4, 7, 11, 13, 14): 18 unsexed 18.1 ± 1.7 (16–23.5)
Iridophanes pulcherrima (2): ♂ 17
Euphonia xanthogaster (1, 2, 6, 10): ♂♂ 13, 13.5, 13.5, 15; 6 ♀♀ 14.1 ± 0.4 (13.5–14.5)
Chlorochrysa calliparaea (2, 4): ♂ 17.5; ♀ 19
Tangara chilensis (1): unsexed 22
Tangara punctata (1, 2): ♂ 17; unsexed 16, 18
Tangara parzudakii (2): ♀ 35
Tangara cyanotis (2): ♀ 17
Tangara cyanicollis (1, 2): ♂ 18; unsexed 16.5
Tangara ruficervix (2): ♂ 18.5
Tangara nigroviridis (4): ♂ 18
Tangara vassorii (8, 9, 13, 14): ♂ 17; ♀ 20; J 13; 6 unsexed 17.8 ± 1.1 (16.5–19.5)
Iridosornis analis (4): ♂ 24; unsexed 28
Iridosornis rufivertex (7, 13): 5 unsexed 23.0 ± 1.7 (21–25)
Anisognathus igniventris (7, 13): J 33.5; 5 unsexed 35.4 ± 3.1 (31.5–40)
Anisognathus lacrymosus (7, 9, 13, 14): 18 unsexed 33.7 ± 2.5 (30–38)
Dubusia taeniata (13): unsexed 38, 39
Ramphocelus carbo (2): ♂ 30; J 27.5
Calochaetes coccineus (2): ♀ 48
Piranga leucoptera (2): ♂ 21
Piranga rubriceps (7): ♂ 42
Tachyphonus rufus (2): ♀ 36.5
Thylpopsis ornata (5, 7): unsexed 11.5, 12
Chlorospingus ophthalmicus (4): ♀ 18; JJ 17.5, 20.5; 7 unsexed 22.1 ± 2.2 (19–25)
Chlorospingus flavigularis (1): 10 unsexed 26.4 ± 1.8 (23.5–28.5)
Chlorospingus parvirostris (1, 2, 4): ♂ 23; ♀ 20; unsexed 22, 25.5
Chlorospingus canigularis (4): ♂ 17; unsexed 16.5
Cnemoscopus rubrirostris (7, 13): unsexed 22.5, 24, 24.5
Hemispingus atropileus (7, 13, 14): 8 unsexed 23.6 ± 2.6 (17.5–26)
Hemispingus verticalis (14): unsexed 14.5, 15
Catamblyrhynchus diadema (6, 10, 13, 14): J 15; 6 unsexed 19.3 ± 2.9 (15–23.5)
Saltator maximus (1): unsexed 42.5
Pitylus grossus (1): ♂ 43.5; ♀ 37
Oryzoborus angolensis (1): ♂ 14; 5 ♀♀ 13.2 ± 1.0 (12–14.5)
Catamenia homochroa (9): ♂ 12.5
Atlapetes pallidinucha (9, 14): 7 unsexed 34.2 ± 6.0 (29–46.5)
Atlapetes rufinucha (5, 6, 7, 9, 10, 12, 13): JJ 25.5, 30; 17 unsexed 29.5 ± 3.8 (23–37)
Atlapetes leucopterus (3): unsexed 24, 24, 25.5
Atlapetes brunneinucha (2): ♀ 46
Atlapetes torquatus (5, 9, 10, 13): 6 unsexed 42.1 ± 5.9 (33–50)
Arremon aurantiirostris (1): unsexed 26.5, 28
Myospiza aurifrons (1, 4): unsexed 18, 19
Zonotrichia capensis (2, 5, 9, 11): J 22.5; unsexed 20.5, 21.5, 24, 26.5
Spinus magellanicus (2): ♂♂ 11, 11

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Distributional records, natural history notes, and conservation of some poorly known birds from southwestern Ecuador and northwestern Peru

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The Andean foothills and adjacent coastal plain of southwestern Ecuador and northwestern Peru form an ecological transition zone between the very humid Colombian and Ecuadorean Pacific rainforests to the north, and the xeric coastal area of Peru to the south. This topographically complex area supports a very broad spectrum of habitats, ranging from dry, desert-like scrub to very humid cloud forests. This range of vegetation types is influenced by a strongly seasonal climate: the period from May to November is usually very dry, but a pronounced wet season occurs from December to April in most years (Brown 1941, Munday & Munday 1992).

Early bird collectors achieved relatively complete geographic coverage and a thorough synthesis of the avifauna was possible by the late 1920s (Chapman 1926). Chapman named the characteristic bird species of the region the *Equatorial Arid Fauna*. In contrast to early ornithological effort, there were very few surveys between 1930 and 1970 (e.g. Marchant 1958, Koepcke 1961, D. Norton and R. A. Paynter in 1964–1965); only in the late 1970s and 1980s did zoologists begin to reinvestigate the area (Schulenberg & Parker 1981, Parker *et al.* 1985, Wiedenfeld *et al.* 1985, Parker *et al.* 1989, Robbins & Ridgely 1990). Up to 1990 the region was still poorly represented in the ornithological literature, and one of its endemic species (the El Oro Parakeet *Pyrrhura orcesi*) was only formally described in 1988 (Ridgely & Robbins 1988). In the last five years, however, survey work has intensified and several survey reports have appeared (Best & Clarke 1991, Bloch *et al.* 1991, Krabbe 1991, Williams & Tobias 1991, Best 1992, Parker & Carr 1992; also unpublished species lists from ANSP and WFVZ surveys). Despite this recent interest in the region, journal papers concerning its avifauna still remain very sparse.

Müller (1973) and Cracraft (1985) discussed the complex biogeographical situation of western Ecuador and adjacent northwestern Peru. Cracraft (1985) noted that several species are restricted to the region, and he named the area to which they are confined the Tumbesian endemic centre after the Department of Tumbes in Peru which forms its spatial centre. The most recent analysis of the endemic avifauna of the Tumbesian region (ICBP 1992) lists 44 endemic species entirely confined to it, the second highest of all 221 Endemic Bird Areas (EBAs) identified by ICBP worldwide. The Tumbesian region overlaps with a number of other EBAs: its eastern fringe borders the South Ecuador/North Peru Cloud Forests EBA (Best & Clarke 1991); whereas to the northeast there is overlap with species from the Chocó/Pacific slope Andes EBA, with some species characteristic of that region also occurring at more humid sites within the Tumbesian area (see discussion).

Recent investigations revealed that the forests of the Tumbesian region have been degraded to a patchwork of agricultural land punctuated by occasional forest remnants. The endemic forest avifauna has thus become isolated in small, scattered fragments which are themselves under threat. At least 15 globally threatened bird species are confined to these forest fragments (Collar *et al.* 1992). When plans for fieldwork were being formulated in 1988 the majority of ornithological data from the region came from prior to 1930. Satellite images from 1986 illustrated that extensive deforestation had ravaged the area since that time. However, of the forest fragments that had survived up to 1988, several had never been surveyed. We were eager to document the avifauna of these areas before they also disappeared. Furthermore, the habitat requirements of the threatened species were poorly known. The only data on the birds' breeding seasons came from the Santa Elena Peninsula in western Ecuador, where breeding coincided with the annual rains (Marchant 1958); the timing of the breeding season in extreme southwestern Ecuador had yet to be established. A combination of these factors encouraged us to mount two expeditions: the first in August and September 1989 (the dry season); the second from January to March 1991 (the wet season). The purpose of this paper is to present our most noteworthy ornithological data from both surveys. Further details of the surveys can be found in Best & Clarke (1991) and Best (1992).

From 8 August to 30 September 1989 B. J. Best, C. T. Clarke, M. Checker, A. McNab, M. Chango and R. Tapia surveyed three sites in Loja Province, Ecuador, for which no previous ornithological data existed (apart from a two-day survey of one site in June 1989 (Bloch *et al.* 1991)) (Fig. 1); C.T.C. and M.C. also visited one site in Piura Department, northern Peru. From 6 January to 13 March 1991 B.J.B., A. L. Broom, M.C., R. M. Thewlis, J. W. Duckworth and J. Cueva surveyed an additional 11 Ecuadorean sites, 7 in Loja Province, 2 in El Oro and 2 in Azuay (five of which were ornithologically unknown), and resurveyed the earlier three in Loja. Details of the sites surveyed appear in Appendix A; their geographical positions are shown in Figure 1.

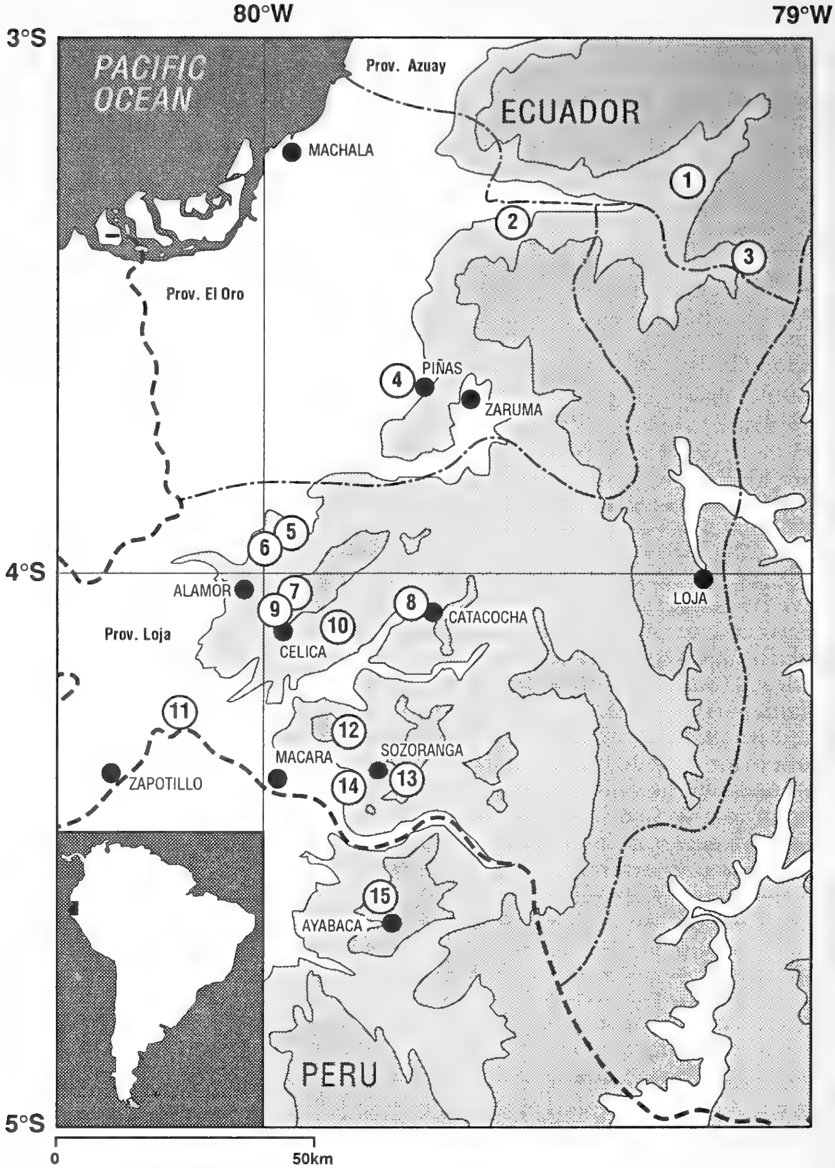

Figure 1. Sites surveyed by the authors in SW Ecuador (and *NW Peru) in 1989 and 1991:

1. Río Rircay Valley†, 3°17′S, 79°15′W.
2. Uzhcurrumi†, 3°21′S, 79°33′W.
3. Oña, 3°25′S, 79°07′W.
4. Buenaventura, 3°40′S, 79°44′W.
5. Vicentino†, 3°57′S, 79°57′S.
6. Alamor, 4°00′S, 80°00′S.
7. Tierra Colorada†, 4°02′S, 79°57′W.
8. Catacocha†, 4°03′S, 79°40′W.
9. Celica, 4°07′S, 79°58′W.
10. El Empalme, 4°07′S, 79°51′W.
11. El Ceibo-Sabanilla†, 4°15′S, 80°08′W.
12. Sozoranga, 4°21′S, 79°47′W.
13. Utuana†, 4°22′S, 79°43′W.
14. Tambo Negro†, 04°24′S, 79°51′W.
15. *Ayabaca†, 04°36′S, 79°44′W.

†sites which were ornithologically unknown prior to our surveys.
Dark stippling denotes land above 2000 m, light stippling land over 1000 m.

A list of all bird species recorded, with relative abundance and breeding data, appears as Appendix B. In the main part of this paper we report noteworthy distributional records of 31 species, with natural history notes and comments on the conservation of the 19 most poorly known. One species, Black-crested Tit-Tyrant *Anairetes nigrocristatus*, and one subspecies, Black-eared Hemispingus *Hemispingus melanotis piurae*, are reported from Ecuador for the first time. Additional information is included from M. Kessler, N. Krabbe and F. Lambert who spent time in the field with the authors during the 1991 survey. This includes sonagrams produced from tape-recordings made by F. Lambert.

Unless specifically indicated to the contrary, the species was searched for, but not recorded, above or below the altitudinal limits given (survey sites covered the range 320–2625 m). Abundance estimates used in the species accounts should be interpreted as in Appendix B. The letter T on the title line denotes species from the Tumbesian EBA; the letter A members of the South Ecuador/North Peru Cloud Forests EBA; and the letter C Chocó/Andean Pacific slope endemics (following the lists of Crosby *et al.* in prep.). If applicable, the Red Data Book (Collar *et al.* 1992) categories of rare, vulnerable, endangered or indeterminate (for threatened species), or 'near-threatened', are indicated.

Tape-recordings mentioned in the text are deposited at the British Library of Wildlife Sounds, London. Acronyms used in the species accounts include: ANSP = Academy of Natural Sciences of Philadelphia; BMNH = British Museum of Natural History, Tring; FMNH = Field Museum of Natural History, Chicago; LSUMZ = Louisiana State University Museum of Zoology; MCZ = Museum of Comparative Zoology, Harvard; MECN = Museo Ecuatoriano de Ciencias Naturales, Quito; and WFVZ = Western Foundation of Vertebrate Zoology, Los Angeles. Bird nomenclature and sequence follow Ridgely & Greenfield (in prep.); habitat classifications follow those of Kessler (in press).

PALE-BROWED TINAMOU *Crypturellus transfasciatus* T, near-threatened

Common at Tambo Negro, Loja Province, Ecuador, from August to September 1989 and January to March 1991 throughout the altitudinal range of that site (600–1000 m). At least 10 were found daily (during four or more hours survey-time) on the floor of *Ceiba trichistandra*-dominated Deciduous Forest, but were wary and often hurriedly ran into dense understorey after detecting our presence. On 20 February 1991, several were heard calling from more open *Ceiba* forest around the military checkpoint, about 15 km E of Arenillas, El Oro Province, Ecuador (3°40′S, 80°07′W). At Tambo Negro they called repeatedly with a loud, resonant *whooit* (tape-recorded) in the early morning and from 17.30 hrs until dark. The species is given near-threatened status in Collar *et al.* (1992); our observations indicate that in open, disturbed deciduous forest (where an understorey still persists), this species can be readily found and is not in immediate danger. This is in agreement with other recent observations (R. Ridgely).

FASCIATED TIGER-HERON *Tigrisoma fasciatum* near-threatened

One was seen perched on a log across a fast-flowing river at Tierra Colorada, Loja Province, Ecuador, on 11 February 1991. This appears to be a southward range extension in western Ecuador from Cañar Province about 200 km to the north. The species is scarce throughout its range (R. Ridgely).

GREY-BACKED HAWK *Leucopternis occidentalis* T, endangered

Seen at six sites in 1991 in El Oro and Loja Provinces, Ecuador, from the lowest study-site (320 m) to 1800 m. Sites (all with at least 2–3 birds) were: Uzhcurrumi, Buenaventura, Alamor, Vicentino, Tierra Colorada and Celica. This species was found in evergreen forest and over adjacent agricultural land. Several putative pairs were seen; on 10 February two birds took part in a spectacular aerial display at Tierra Colorada, involving one bird rising to several hundred metres, then diving vertically down towards the other, uttering a drawn-out, screeching *keeeearr*. At Vicentino on 8 February, one of two birds flying together carried sticks in its feet which it deposited in an isolated tree in a field (but no nest could be seen). Most observations involved lone individuals or presumed pairs sitting at mid- to upper-storey level (often calling to each other), inside or on the edge of forest, or in isolated trees in agricultural areas.

Although *L. occidentalis* is clearly vulnerable to deforestation, our observations suggest that areas maintaining small patches of remnant humid forest can still support small numbers of this species, at least in the short term. However, as for the majority of bird species endemic to the Tumbesian region, its precise breeding requirements need to be determined.

SOLITARY EAGLE *Harpyhaliaetus solitarius* near-threatened

One soaring at 1800 m over Quebrada Suquinda (4 km NW of Sozoranga town), Loja Province, on 22 September 1989, was mobbed by two Harris's Hawks *Parabuteo unicinctus*. There are scattered records of *H. solitarius* from a few sites in the Ecuadorean Andes and foothills (e.g. Buenaventura, Robbins & Ridgely 1990). This species is rare throughout its range from Central America to Argentina (Fjeldså & Krabbe 1990) and is thought to be threatened by montane forest destruction (Collar & Andrew 1988); it has recently been given near-threatened status in Collar *et al.* (1992). R. Ridgely informs us that the species may have huge territories and hence be naturally rare throughout its range.

RUFOUS-HEADED CHACHALACA *Ortalis erythroptera* T, near-threatened

Found at 7 sites in western Loja and in El Oro Province, Ecuador, in small patches of remnant forest in the altitudinal range 900–1850 m. At Quebrada Namballe, 6 km NW of Sozoranga town, this species occurred at 1850 m, higher than the previously known altitudinal limit of 1390 m (Chapman 1926), while Tambo Negro is the most southerly known site. Approximately 30 small groups (2–5 birds in each) were encountered during the 1991 survey, and at Sozoranga roughly twice as many groups were found from January to March 1991 as in August and September 1989. *O. erythroptera* occurred in deciduous forest, but was most common in semi-evergreen and evergreen forest patches, and occasionally also in adjacent agricultural land where they were seen in a banana plantation and on the ground in a maize-field.

They were regularly heard vocalizing in the early morning, when groups of up to seven individuals conducted extended bouts of counter-calling from tall trees (also heard later in the day). At Tierra Colorada groups called for extended periods during the day every 2–3 days; on intervening days only sporadic birds called, which did not stimulate others to call. The maximum density of calling groups was recorded on 11 March 1991: 6 groups in a 1–2 km^2 area around Quebrada Yaguana at Sozoranga. We agree with Parker *et al.* (1989) that the raucous, repeated *kwak-ar-ar-ar* call is noticeably slower and lower-pitched than in other members of the genus *Ortalis*. Presumed pairs at Quebrada Yaguana (Sept. 1989) and Tierra Colorada (Feb. 1991) gave a variety of calls including a soft cooing, a harsh *cow*, and a fast, repeated *kawuck* (tape-recorded).

At Sozoranga, local people claimed to hunt *O. erythroptera*, but we never saw the species being hunted at any site, despite being easily found along well-used roads. Although forest fragmentation is expected to have caused a decline in the numbers of *O. erythroptera*, it is still fairly common in many forest remnants. This has led to the species being deleted from the threatened categories of Collar *et al.* (1992) and placed with the near-threatened species. It should be borne in mind that genetic isolation of groups in forest remnants is a further threat to this, and many other forest-dependent Tumbesian endemics (S. Strahl).

BEARDED GUAN *Penelope barbata* A, vulnerable/rare

A small group was encountered at 2625 m in Humid Montane Cloud Forest at Cerro Chacras above the town of Ayabaca, in Piura Department, Peru. On 23 September 1989 three birds flew into a small tree, where they started feeding. The following day, several were heard calling and wing-drumming at dawn, and a single bird at 15.30 hrs perched in the mid-storey of a large tree. *P. barbata* is confined to the Andes of southern Ecuador and northern Peru and is declining due to temperate zone deforestation and hunting (Bloch *et al.* 1991). It is apparently less wary than *Ortalis erythroptera* (C. Rahbek) and can still be readily found in some areas of extensive cloud forest, such as the Podocarpus National Park in southern Ecuador. The most recent estimate of the Ecuadorean population is *c.* 1500 individuals (Bloch *et al.* 1991).

RUFOUS-NECKED WOOD-RAIL *Aramides axillaris*

One on 11 March 1991 was walking slowly through leaf-litter below secondary, Semi-evergreen Lower Montane Cloud Forest at 1400 m at Cerro Florida 3 km ENE of Sozoranga town, Loja Province, Ecuador. The record extends the known upper altitudinal limit in Ecuador by 800 m. Away from coastal mangroves, there are very few records of *A. axillaris*. In February 1988 M. Kessler found the species breeding in the North-West Peru Biosphere Reserve (Parker *et al.* 1989).

OCHRE-BELLIED DOVE *Leptotila ochraceiventris* T, endangered

This rare, elusive dove was found at five new sites ranging from 650 to 2625 m (the latter being the highest study site); four in Loja Province, Ecuador: Vicentino, Catacocha, Sozoranga and Tambo Negro, the fifth in Piura Department, Peru (Ayabaca). The Ayabaca record at Cerro

Chacras (2625 m) unexpectedly extends the known upper altitudinal limit of this species by 700 m into the temperate zone. Small numbers (1–7 per day) were found in deciduous, semi-evergreen and evergreen forest, on the leafy forest floor or in low bushes and trees, mainly in shady, humid ravines (where they often gathered at streams to drink among larger numbers of White-tipped Doves *L. verreauxi*). On three occasions at Sozoranga, individuals or small groups occurred in low scrub away from forest. In February 1991 a captive bird in Alamor (4°02′S, 80°02′W) shared a tiny cage with a Grey-cheeked Parakeet *Brotogeris pyrrhopterus*, having been trapped on agricultural land near to the town where large numbers of *L. verreauxi* occurred.

This species was heard vocalizing only during our January–March 1991 survey, indicating they were then probably approaching breeding. The presumed territorial call (tape-recorded by N. Krabbe) is a short, guttural *whoouur*, rising then falling. In early February and early March 1991 four were found calling from a small patch of Semi-evergreen Cloud Forest at Panacillo just NE of Sozoranga town. On 16 February one called from an open area of secondary forest at Vicentino. On 9 March, five weeks into the rainy season, three called from *Ceiba trichistandra*-dominated Deciduous Forest at Tambo Negro. None were vocalizing at Tambo Negro in August and September 1989 (but the species was seen), nor in late January and early February 1991 before the onset of the annual rains. In September 1989 birds fed on the marble-sized ripe fruit of a *Trichilia* tree in Quebrada Suquinda at Sozoranga, the first documented food-plant.

L. ochraceiventris has disappeared from several Ecuadorean localities (e.g. Santa Rosa in El Oro Province; along the Río Babahoyo, Guayas Province) which have been deforested, and is clearly threatened by deforestation and understorey degradation. This species seems especially vulnerable to understorey disturbance, a characteristic shared by three other Tumbesian endemics: Blackish-headed Spinetail *Synallaxis tithys*, Henna-hooded Foliage-gleaner *Hylocryptus erythrocephalus* and Grey-headed Antbird *Myrmeciza griseiceps*.

RED-MASKED PARAKEET *Aratinga erythrogenys* T, near-threatened

Widespread, occurring at all but three of the sites surveyed from the lowest site (320 m) to 2500 m; we also often saw it when travelling between the sites. This parrot was found in deciduous, semi-evergreen and evergreen forest, and in adjacent agricultural land with scattered trees and bushes. In August and September 1989 *A. erythrogenys* flew over Tambo Negro in large groups of up to 140 individuals at dusk, probably moving to nocturnal roosts; large groups also flew by Utuana at dusk in that month. From January to March 1991 fewer and smaller groups were seen at Tambo Negro; several obvious pairs included those investigating holes in mature *Ceiba trichistandra* trees. Courtship was observed at Tambo Negro and Tierra Colorada. The largest flocks seen during January–March 1991 were at Tierra Colorada, where the largest flock numbered 82 individuals.

These observations indicate that in southwestern Ecuador, *A. erythrogenys* breeds during the rainy season. The species frequently flocked with *Brotogeris pyrrhopterus*; mixed groups were often seen feeding in fruiting and flowering trees. In late August 1989, they fed on red *Erythrina* flowers at Tambo Negro which also attracted 13 other bird species and the squirrel *Sciurus stramineus* (Best & Clarke 1991). *A. erythrogenys* was the most common captive parrot in the study area; the species is probably threatened by the international cage-bird trade, as large numbers are annually exported from Peru (M. Kessler, IUCN data) and population declines in a number of areas are thought to be due to intense deforestation (P. Greenfield, R. Ridgely). Although considered potentially threatened by several workers (Best & Clarke 1991, Bloch *et al.* 1991, P. Greenfield, R. Ridgely), *A. erythrogenys* is not listed as officially threatened in (Collar *et al.* 1992); these authors preferring the 'near-threatened' category because it is still common in many Tumbesian localities. However, as it requires stands of trees for breeding colonies, and is evidently a popular cage-bird, it should be carefully monitored.

EL ORO PARAKEET *Pyrrhura orcesi* T, vulnerable/rare

On 15 February 1991 a new population of this recently described (Ridgely & Robbins 1988) parakeet was found by N. Krabbe and M. Kessler when a flock was heard in dense mist at 1300 m between Guanazán and Uzhcurrumi in northern El Oro Province (3°23'S, 79°32'W). This area (situated *c.* 40 km N of the 1980 type-locality at Buenaventura west of Piñas (Ridgely & Robbins 1988) consisted mainly of gardens and orchards, with some tiny patches of wet forest. The record also extends the known upper altitudinal limit of *P. orcesi* by 300 m. We also encountered this species at Buenaventura, in groups of 3–10 individuals within and on the edge of Very Humid Premontane Cloud Forest. In addition to the above two localities, *P. orcesi* is only known from four others: Piedras in El Oro Province (a previously overlooked specimen in the BMNH: Ridgely & Robbins 1988) and three localities on the Pacific slope in Azuay Province to the north (Collar *et al.* 1992), and is thus very vulnerable to deforestation within its tiny range.

GREY-CHEEKED PARAKEET *Brotogeris pyrrhopterus* T, near-threatened

Found at 8 sites in Loja and El Oro Provinces, Ecuador, from 320 m (the lowest study site) to 1400 m. In addition to those sites listed in Appendix B, groups were also found at numerous places whilst travelling between the study sites. *B. pyrrhopterus* occurred in deciduous and semi-deciduous forest, and also in adjacent agricultural areas, but seemed to prefer drier habitats. At Tambo Negro, they formed groups of up to 40 in August and September 1989; smaller groups predominated there from January to March 1991, with many pairs. These investigated holes in mature *Ceiba trichistandra* trees, copulated and allopreened. A pair was also seen copulating there in August 1989. Groups fed on *Erythrina* flowers at this site in August and September 1989, and on *Ceiba* seeds in January.

Several captives were seen in the study area; like *A. erythrogenys*, the present species is probably threatened by the international cage-bird trade and by habitat destruction. No fewer than 97,947 were reported in trade from 1982–1990, and large shipments of this species into the USA and Europe apparently continue (IUCN data). Despite marked population declines in some areas (e.g. along the Río Babahoyo; Best & Clarke 1991), *B. pyrrhopterus* is not listed in one of the threatened categories of Collar *et al.* (1992) because it is still fairly common in degraded agricultural habitats. However, because the species nests in tree-holes (Parker *et al.* 1989) it is still vulnerable, and has been given near-threatened status in Collar *et al.* (1992).

PERUVIAN SCREECH-OWL *Otus roboratus* T

Several heard in February–March 1991 in Loja Province, Ecuador, in *Ceiba*-dominated Forest at Tambo Negro, and also two singles near Sozoranga (Panacillo and Quebrada Yaguana), both in Semi-evergreen Lower Montane Cloud Forest. Two different vocalizations were heard: a barked *ow* and a short trill; these match the calls of this species recorded by other workers. On range, these records probably refer to the subspecies *O. r. pacificus* which is known from several localities in northwestern Peru (Johnson & Jones 1990). *O. roboratus* has only recently been confirmed as occurring in Ecuador, and a series of new records extends its known northerly limit to Jauneche in Los Ríos Province at 1°10′S, 79°30′W (P. Coopmans, Parker & Carr 1992).

STYGIAN OWL *Asio stygius*

On the evenings of 10, 11 and 12 March 1991, one was watched by spotlamp, perched on a television aerial in Sozoranga town centre (Loja Province, Ecuador). It called each night with a deep, repeated *hwooo* for variable periods around 22.00 hrs. Residents described the species as 'common' and a nuisance, because the presence of birds on television aerials interferes with reception. Furthermore, sometimes this species and Barn Owl *Tyto alba* are captured, doused with petrol then set alight and released. *A. stygius* is rare or very local throughout its range from Central America to Argentina (Fjeldså & Krabbe 1990).

RAINBOW STARFRONTLET *Coeligena iris* A

Recorded at four sites in Loja Province, Ecuador, in Semi-evergreen Lower Montane and Montane Cloud Forest and in nearby humid shrubbery from 1700 m (unusually low for the species) to 2625 m (the highest study site; *C. iris* occurs higher in nearby mountains (Bloch *et al.* 1991)). At Utuana in September 1989 *C. iris* was fairly common, and in February 1991 this species and Purple-throated Sunangel *Heliangelus viola* took part in both inter- and intra-specific territorial disputes. *C. iris* is restricted to montane southern Ecuador and northern Peru (Fjeldså & Krabbe 1990), and although given near-threatened status in Collar & Andrew (1988), the species is no longer considered at risk because it occurs so commonly in degraded secondary habitats.

GORGETED SUNANGEL *Heliangelus strophianus* C, near-threatened

Small numbers were seen at Buenaventura, El Oro Province, Ecuador, in February and March 1991, frequenting the mid- and understorey of Very Humid Premontane Cloud Forest. This species is a virtual Ecuador endemic and these records constitute a southward range extension from Azuay Province, approximately 100 km to the north (Ridgely & Greenfield in prep.).

PURPLE-THROATED SUNANGEL *Heliangelus viola* A

Fairly common at two sites in Loja Province, Ecuador: Utuana and Celica, and also found at Ayabaca in Piura Department, Peru, in Humid Montane Cloud Forest and humid shrubbery from 2000 to 2625 m (the highest study site; like *C. iris* it occurs at higher elevations nearby (Bloch *et al.* 1991)). It possesses a distribution similar to *Coeligena iris* and was similarly given near-threatened status in Collar & Andrew (1988), being formally considered a true forest hummingbird. However, like that species, it occurs regularly in degraded areas and is not in any danger (R. Ridgely). This is confirmed by Collar *et al.* (1992) who do not list the species as near-threatened.

BLACKISH-HEADED SPINETAIL *Synallaxis tithys* T, endangered

Recorded only in forest at Tambo Negro where it occurred throughout the altitudinal range of the locality (600–1000 m), extending the known upper altitudinal limit of the species by 250 m. Tambo Negro is also the most southerly point of the species' known range, and the most inland site. A MCZ specimen was collected within 2 km of Tambo Negro in October 1965 by D. Norton (R. Ridgely). Small groups or presumed pairs foraged in the leaf-litter and the understorey of *Ceiba*-dominated Deciduous Forest; birds were mainly observed 1 m or less from the ground (exceptionally to 5 m, see below). The species seemed most common in denser understorey, frequently hopping through the leaf-litter (one individual was seen to completely immerse itself under leaves), sometimes with Black-capped Sparrows *Arremon abeillei*. In January and February 1991, several were found calling high up (to 5 m) in leafless trees. Their distinctive, churring, wren-like call, a short upward inflected trill, was tape-recorded (Fig. 2).

We believe *S. tithys* is gravely at risk from deforestation and understorey disturbance; in the last decade it has been found at only seven sites, all but one in Ecuador (see Collar *et al.* 1992), being confined to forest in all except one. Even at that locality (Alamor) the species may only occur seasonally (Williams & Tobias in prep.).

RUFOUS-NECKED FOLIAGE-GLEANER
Syndactyla (Automolus) ruficollis T, endangered

Occurred at six sites in Loja Province, Ecuador, and at Ayabaca in Piura Department, Peru, from 600 to 2625 m (the highest study site). The species was uncommon from 600 to 1000 m in *Ceiba*-dominated Deciduous Forest (there are very few recent records below 1000 m; Ridgely & Greenfield in prep.), being commoner above 1500 m in the mid- and understorey of Semi-evergreen Lower Montane and Montane Cloud Forest, sometimes in bamboo. The bird occurred in single-species and mixed-species flocks including one unusually large group of at least 10 *S. ruficollis* foraging in a loose flock through cloud forest trees on 22 September 1989 at Utuana. *S. ruficollis* frequently probed the bases of arboreal bromeliads, presumably in search of arthropods.

On 3 February 1991, one at Tambo Negro foraged in the leaf-litter, behaviour more typical of Henna-hooded Foliage-gleaner *Hylocryptus erythrocephalus*. Vocalizations included a staccato *chek*; the territorial song was a drawn-out *chik, chik, che-che, tirrrrrr*, the last note drawn-out

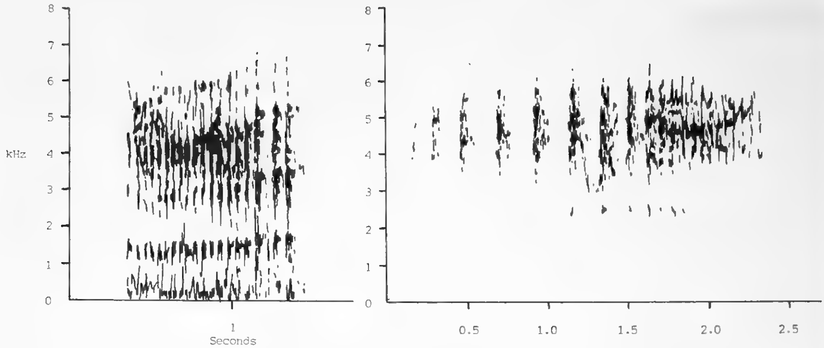

Figure 2. Calls of *Synallaxis tithys* (left) and *Syndactyla ruficollis* (right), from recordings made by Dr F. Lambert.

and downward inflected (Fig. 2). On the basis of its vocalizations and arboreal habits this species is now usually treated as a *Syndactyla* rather than an *Automolus* (Fjeldså & Krabbe 1990, Parker *et al.* 1989); our recordings of its voice and observations of its behaviour support this taxonomic revision. This information on *S. ruficollis* supplements that of Parker *et al.* (1985) from Cruz Blanca in Piura Department, Peru. *S. ruficollis* is threatened by deforestation and especially the trampling of undergrowth by cattle and clearance of bamboo for pack animal fodder (Best & Clarke 1991, Parker *et al.* 1985). Its distribution is more montane than most of the Tumbesian endemics and it occurs in the same threatened forest types as the Grey-headed Antbird *Myrmeciza griseiceps*.

HENNA-HOODED FOLIAGE-GLEANER
Hylocryptus erythrocephalus T, indeterminate

This distinctive furnariid occurred at four sites in Loja Province, Ecuador, from 600–1800 m. The 1800 m sightings at Sozoranga make that site the highest so far discovered for the species, which was previously known only to 1390 m near Alamor (Chapman 1926). At Tambo Negro it was fairly common and easily located during January–March 1991, although it had not been found in August–September 1989, suggesting that it may undertake local seasonal movements. It occurred singly, in presumed pairs or in mixed-species flocks under *Ceiba*-dominated Deciduous Forest and Semi-evergreen Lower Montane Cloud Forest, and appeared to favour areas with a dense understorey and a thick covering of leaf-litter, often under less disturbed forest. Individuals spent much of the time on or within 1 m of the forest-floor, habitually rummaging noisily in the leaf-litter, tossing leaves and twigs into the air (making them conspicuous when feeding). These observations complement those of Wiedenfeld *et al.* (1985) and Parker *et al.* (1989) from Tumbes Department, Peru.

The staccato, chattering call (see Paynter 1972 for sonagram) was not heard at Sozoranga or Tambo Negro on our August to September 1989 survey, but was repeatedly heard there during January to March 1991 (when it was tape-recorded). But in June 1989 the bird was heard calling in Quebrada Yaguana at Sozoranga (Bloch *et al.* 1991). Birds occasionally perched up to 3 m in low bushes and trees and called repeatedly.

On 27 January 1991 a dispute involved three individuals chasing and violently attacking each other up to 2 m off the ground, making short flights from branch to branch and calling very loudly. *H. erythrocephalus* is a hole-nester (the first occupied nest-hole was found by M. Kessler in February 1986 at El Caucho in the North-West Peru Biosphere Reserve in Tumbes Department; Parker *et al.* 1989) and at least four probable nest-holes were found, surrounded by low scrub, in the crumbling roadside earth-cliffs near Sozoranga. The bird is threatened by deforestation and understorey clearance in the tropical and subtropical zones, and except for an outlying population in Manabí Province, Ecuador (Parker & Carr 1992, R. Ridgely), it is confined to a small area of Ecuador's El Oro and Loja Provinces and adjacent northwestern Peru.

(*to be continued*)

The name of the Ecuadorean subspecies of the Chestnut-collared Swallow *Hirundo rufocollaris*

by Kenneth C. Parkes

Received 19 May 1992

In much of the literature, the Cave Swallow *Hirundo fulva* of the southern U.S., Mexico, and the West Indies, is credited with having two isolated subspecies on the west coast of South America, in Peru and Ecuador. Ridgely & Tudor (1989) considered these populations to represent a separate species, the Chestnut-collared Swallow *H. rufocollaris*, and this treatment is followed here. The type locality of *Hirundo rufocollaris* Peale, 1848, is in Peru. Chapman (1924) named the Ecuadorean population *Petrochelidon rufocollaris aequatorialis*.

Earlier, Lawrence (1867) had described a new species as "*Hirundo aequitorialis*". This name has always been considered to be a synonym of *Tachycineta albiventer* Boddaert, 1783, the White-winged Swallow. Hellmayr (1935: 71, footnote) stated that "*aequitorialis*" of Lawrence was a misprint for "*aequatorialis*". Brooke (1974) accepted Hellmayr's dictum, and pointed out that once *Petrochelidon* was merged with *Hirundo*, as now accepted by the majority of authors, *P. rufocollaris aequatorialis* Chapman, 1924, would be preoccupied by *H.* "*aequatorialis*" Lawrence, 1867. Brooke therefore renamed the Ecuador subspecies of Chestnut-collared Swallow as *Hirundo (Petrochelidon) fulva chapmani*, nom. nov.

The difficulty with all of this is that Hellmayr's statement was contrary to the International Code of Zoological Nomenclature. The name *aequitorialis* appears only once in Lawrence's paper (which Brooke had not seen), so that there is no internal evidence that this was in fact a *lapsus calami*. Article 57(f) of the 3rd edition (Ride *et al*. 1985) of the Code states: "Except as specified in Article 58, a one-letter difference between species-group names is sufficient to prevent homonymy . . ." Article 58 lists 14 kinds of spelling differences that constitute exceptions to Article 57(f) such that names so differing are nevertheless homonymous; *none* of these exceptions applies to the case of *aequitorialis* versus *aequatorialis*. Chapman's name *aequatorialis* will therefore stand for the Ecuadorean subspecies of Chestnut-collared Swallow, with *chapmani* Brooke as a synonym.

Although *Hirundo aequitorialis* Lawrence now rests in the synonymy of *Tachycineta albiventer*, that species is currently considered to be monotypic. Its type locality is Cayenne, and it has a very large range in South America. Lawrence (1867) gave the type locality of *aequitorialis* as "Ecuador, Quito", but according to Hellmayr (1935), Lawrence's holotype, now in the collection of the American Museum of Natural History, is from the Río Napo. It is quite conceivable that geographic variation in *T. albiventer*, may be detected at some future time, in which case the name *aequitorialis* may be revived for far western populations. Carnegie Museum of Natural History has no material from Ecuador, but two specimens from eastern Bolivia have distinctly longer wings than topotypes from Cayenne and specimens from eastern Amazonian Brazil.

Acknowledgement

I am grateful to my colleague Robin K. Panza, who called my attention to long-forgotten nomenclatural notes on these swallows that I wrote at the time of the publication of Brooke's paper.

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Phrygilus coracinus Sclater, 1891, is a valid taxon

by Jon Fjeldså

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On 30 April 1987 an almost totally black sierra-finch was mistnetted and collected at 4350 m altitude in the lower parts of extensive bushy woodland of *Polylepis tarapacana* on the slope of the Sajama volcano in arid western Oruro, Bolivia, near the Chilean border (loc. 94e in Fjeldså 1987). The bird resembled a male of the Patagonian *Phrygilus carbonarius*, but differed from it by having thin white wing-bars and by being larger, like *P. fruticeti*. On the following day a bird resembling a normal male *P. fruticeti* was seen on a rocky *Polylepis* slope a few km away (Loc. 94d), which could indicate that the collected bird was a melanistic individual of *P. fruticeti*.

Later it became clear that the blackish form had been described and named *Phrygilus coracinus* on the basis of a bird collected "8 leagues from Sacaya" in Tarapacá in northern Chile in 1886 by A. A. Lane (Sclater 1891; see also Lane 1891). However, the taxon was synonymized by Hellmayr (1932), who pointed out that the bird was in very worn plumage (lacking grey feather-edges) and that a less blackish specimen had been taken by Lane together with the *coracinus* type. Hellmayr (*op. cit.*) thus interpreted *coracinus* as a dark individual variant in an extremely worn dress. He also pointed out that the illustration (P1.13) in Sclater (1891) conveys a wrong impression of the bird.

Having examined large numbers of *P. fruticeti* specimens, I here demonstrate that Hellmayr's synonymization of *P. coracinus* was also mistaken.

Specimens examined

The examination of specimens was done in 1987–89 as part of a general study of differentiation of populations of birds inhabiting shrubby habitats and relict woodlands in the high parts of the Andes. 259 specimens of *P. fruticeti* were studied in the following institutions: the American Museum of Natural History, New York; Academy of Natural Sciences, Philadelphia; Natural History Museum, London (Ornithology Department in Tring); Carnegie Museum, Pittsburgh; Field Museum of Natural History, Chicago; Louisiana State University, Museum of Zoology, Baton Rouge; L'Institute Royal des Sciences Naturelles, Bruxelles; Museo Argentino de Ciencias Naturales "Bernardino Rivadavia", Buenos Aires; Museo de História Natural "Javier Prado" de la UNMSM, Lima; Museo Nacional de Historia Natural, La Paz; Muséum National d'Histoire Naturelle, Paris; National Museum of Natural History, Smithsonian Institution, Washington, D.C.; Rijksmuseum van Natuurlijke Historie, Leiden; Royal Ontario Museum, Toronto: Swedish Museum of Natural History, Stockholm; Zoologisches Forschungsinstitut und Museum Alexander König, Bonn;

Universidad San Antonio Abad del Cusco; and Zoological Museum, University of Copenhagen.

Colour terminology follows Ridgway (1912).

Geographical distribution

Phrygilus fruticeti is widely distributed in Andean valleys and along the slopes in Argentina and Chile and northwards through Bolivia to northern Peru, from sea-level in the south, but mainly in the lower part of the temperate zone in the north (1500–3850 m). Within its wide range it is common locally in semi-arid zones and usually below the limit of regular nightly frost. It favours the shrub-steppe vegetation and may form semi-colonies in places with short-fallow shifting and some hedges and clumps of composite and solanaceous shrubbery, *Colletia* shrub and columnar cacti. It is generally absent from the high plateaus, except locally near the large wetlands, which may have a stabilizing effect on the local climate. On the basis of this general pattern it is somewhat surprising to find it locally in the arid puna zone of western Bolivia, mainly in the transition zone between the tolar steppe (*Lepidophyllum*) and the *Polylepis* scrub of the volcanic slopes (see Fig. 1, and Lieberman 1985 for typical habitat zonation).

Variations in measurements

The only measurement taken on all examined specimens is flattened wing-length. The variation for adult males in shown in Table 1 (females were poorly represented in certain parts of the range and are not shown; however, they appear to follow a parallel geographical pattern, with mean values 5 mm below those for males). The table shows a quite stable mean around 100 mm (but with a platykurtic variance) all the way from the south of the continent to northern Chile and the altiplano of Puno in Peru, and thereafter another level around 93 mm in the rest of Peru, in the inter-Andean basins as well as on the Pacific slope. Birds of the upper Urubamba Valley of Cuzco and on the Pacific slope in southern Peru are very variable, giving intermediate mean values. A comparison of males from north and south of this transition zone gives a coefficient of difference of 1.17, which corresponds to 88% joint non-overlap. However, the weight (data on some labels) appears to be constantly around 35 g (males) all the way, and according to Zimmer (1924) the same lack of variation holds true also for bill and tarsus. Therefore, the only variation seems to be in the relative wing-length.

General plumage description

Comparing plumage colours is complicated by the seasonal variation caused by wear of the feather edges. Fresh-moulted birds (during the southern winter) are rather uniform drab-coloured with broad ochraceous tawny to drab-grey feather-edges (pale grey on the black foreparts) and very little of the black feather-centres shining through. These edges wear off in the more contrasting breeding dress. Thus, it is necessary to examine the hidden parts of the plumage and judge what each individual bird would look like if it were in full breeding garb. In this condition, adult males are characterized by extensive deep gull-grey areas

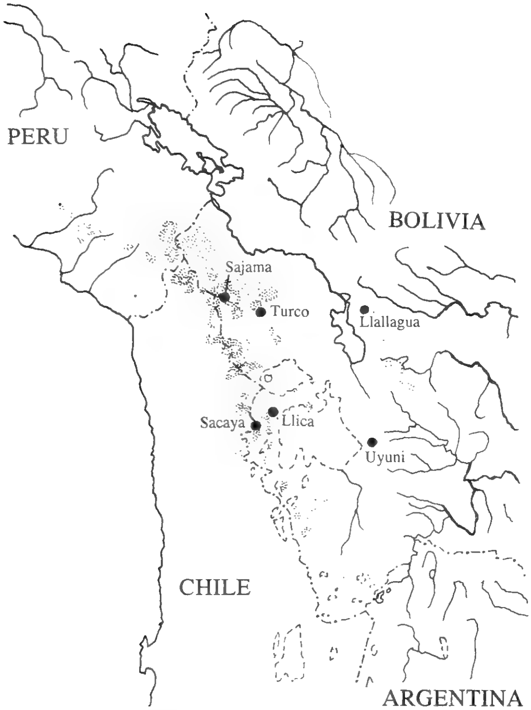

Figure 1. Records of typical *Phrygilus fruticeti coracinus*, with the distribution of *Polylepis* scrub on lava plateaus and volcanic slopes in western Bolivia shaded.

TABLE 1

Wing-lengths (flattened, mm) of males of *Phrygilus fruticeti* from different parts of the range. N Peru is defined as montane basins of northern Peru and Pacific slope south to Ica; C Peru as the valleys of Huancavelica, Ayacucho and Apurímac; S Peru as the Pacific slope of southern Peru; S Bol as the valleys of Potosí, Chuquisaca and Tarija; W Bol as the high plateaus of western La Paz, Oruro and Potosí and adjacent Chile, inhabited by *P. fruticeti coracinus*; C Chile is from Coquimbo to Puerto Montt. Other geographical names are single Departments, or otherwise self-explanatory.

Area	*n*	Wing-length mean	s.d.
N Peru	22	93.0	2.2
C Peru	14	92.5	2.3
Cuzco	36	95.6	2.5
Puno	6	97.9	2.2
S Peru	9	97.2	3.2
W Bol	5	104.8	3.1
La Paz	10	98.2	2.2
Cochabamba	14	100.2	2.3
S Bol	7	100.4	2.1
Atacama desert	4	103.6	1.2
C Chile	13	98.2	2.3
Argentina	7	98.3	1.8

especially on sides of head, neck and body and on lower back and rump; the remaining upperparts grey with black streaks but some feather-edges on crown, mantle and humerals ochraceous; black throat and breast and white lower underparts. Females have grey parts partly replaced by light ochraceous, the grey breast streaked black, ear-coverts warm orange-brown, and the face distinctly patterned with white whiskers separated by blackish malars from the white upper throat. Juveniles are buffier with fine streaks on the sides. In all plumages, the median and greater wing-coverts are tipped white, forming two wing-bars which are 5 mm broad in typical males.

Geographical variation in colours and pattern

In general, Peruvian males have narrow (tapering) dark streaks on the crown and (notably) hindneck, extensively deep gull-grey sides of head and heavy blackish stripes on mantle and humerals. A quite similar colouration was found also in birds from Putre (Tacna) and further south in Chile, and in Patagonia, but these birds usually appear slightly more ochraceous grey, with the dark dorsal streaks diluted to a dull earth-brown. Birds of the Altiplano of southern Peru and Bolivia had broader crown-streaks often invading the otherwise grey areas on cheeks and ear-coverts.

On the whole, the variation is subtle so far, as also indicated by the accounts of Zimmer (1924) and Hellmayr (1932). However, birds from the arid puna of western Bolivia are strikingly different, and correspond to "*Phrygilus coracinus*": males are black almost throughout, save for some thin grey or clay-coloured feather-edges, especially above (foreparts of a bird in fresh plumage shown on Plate LVIII 9d in Fjeldså & Krabbe 1990); males in worn dress are jet black, except for traces of grey streaks on back and rump, and conspicuous white feather-tips only in the cloacal region and vent. The white wing-bars and pale grey tail-tip are always very narrow (1–2 mm). The legs (of the Sajama bird) were darker orange brown than the light brown or straw colour in birds from lower-altitude sites in Peru and Bolivia (live birds handled on several occasions).

Adult females (by label data) from this area have grey and black foreparts and almost match adult males of other populations; the only constant difference being paler grey lores grizzled with blackish feather-tips, instead of fully black lores, and the ear-coverts showing some brown tinge. They are thus entirely different from the ochraceous-washed females of other populations.

Most *coracinus* specimens have been collected by M. A. Carriker, Jr., and have been available to many other students. However, no-one has commented on their distinctive characters. This may have two reasons: the species was viewed as widespread and uninteresting 'trash', and series with black males and females resembling 'normal' males give the immediate impression of strongly variable males.

Typical *coracinus* specimens are from the Sajama volcano (1), Llica west of Uyuni salt-lake (7), Uyuni (3), Llallagua (2) and Sacaya (the type in the Natural History Museum) (Fig. 1); furthermore there was one aviary specimen (Carnegie Museum, misidentified as *P. carbonaria*).

M. Kessler (pers. comm.) saw *coracinus* in *Lepidophyllum* habitat in the Sajama area and further southeast near Turco but not further south, and the range is probably restricted mainly to the mosaics or ecotones of *Lepidophyllum* and *Polylepis* shrubbery in western Bolivia (stippled area in Fig. 1). The localities are at 3700–4400 m. At Sacaya (altitude variously given as 3050, 3800 and 3960 m) it may have been a visitor from higher altitudes, as the locals did not know the bird (Lane 1891).

This form is so distinctive that one could immediately suspect it to be a separate species. However, some intermediate specimens exist in collections, suggesting hybridization in the adjacent ecotones. One intermediate male was taken at Sacaya with the type of *coracinus* (Hellmayr 1932), another at Pampa Aullagas at 3700 m in Oruro, and individuals coming closer to 'typical' Bolivian birds are from Potosí (1) and Callipampa near the north corner of Lake Poopo in Oruro (4). Slight tendencies towards *coracinus* were seen in single individuals (among normal specimens) from the upper Pilcomayo drainage west of Potosí, Cerdas in Potosí, and from Nor Cinti in Chuquisaca. As stated above, a rather strongly black-streaked crown and face characterises most Bolivian specimens, but was not shown by a series from Putre in Tacna in northernmost Chile.

Specimens of transitional types are almost as well represented in collections as typical *coracinus*. However, I am sure that this is a sampling error, because much more collecting has been done along the main roads following the eastern edge of the Altiplano (which appears to be the hybrid zone) than in desolate western Bolivia.

Conclusion

I propose that *coracinus* be recognized as a well-marked subspecies with a small range in western Oruro and Potosí and maybe into the very nearest alpine zone of northern Chile. The typical life-zone of *P. fruticeti coracinus* may be the pumice slopes and lava formations with scattered *Polylepis* shrubbery fringing low-lying areas with *Lepidophyllum* steppe and small meadow-like areas. *P. fruticeti* sometimes ascends to the lower fringes of *Polylepis* woodlands (3850 m) elsewhere in the Andes, but these habitats in western Bolivia are generally above 4000 m and climatically much more extreme. This part of the puna zone is characterized by drought, very clear air and blazing sun. Mid-day temperatures are pleasant, but the nights and early mornings are biting cold, especially on the plains below the *Polylepis*-dotted slopes.

Bird species with wholly or partly black plumages are generally well represented in desert, especially in desert mountains. Thus *P. fruticeti coracinus* can be seen as an example of a more widespread adaptive trend. It may be no coincidence that the 'hooded' sierra-finches have a black-headed representative (*Phrygilus atriceps*) in the arid parts of the high Andes, and furthermore that its populations in the most arid western part of the central range have almost black wings (Fjeldså & Krabbe 1990: 661). Black colour should cause increased heat gain and reduce the harmful radiation that penetrates to the skin, and it increases a feather's resistance to wear (Finch *et al.* 1980, and especially Burtt 1986), all of which should be valuable in the climate of western Bolivia.

The northern subspecies *P. fruticeti peruvianus* is poorly differentiated; the joint non-overlap of 88% with southern birds in wing-lengths of males is slightly below the conventional level for subspecific difference of 90%, but the northern birds differ additionally by having more distinctive black streaking on their backs. I will therefore recommend maintaining this subspecies. Zimmer (1924) defined the range of *peruvianus* as Peru, but as he had specimens only from the northern part of the country, and no specimens from Bolivia or extreme northern Chile, he could not know where to draw the line between the two subspecies. Hellmayr (1932) extended the range of *peruvianus* to La Paz (but this is hardly supported by his list of measurements), and Paynter (1970, with no evidence stated) extended it to Cochabamba in Bolivia. Judging from Table 1 and plumage colours (see above), *peruvianus* is restricted to Peru north of Puno and Arequipa. The main 'filtering barriers' for gene-flow may be the transverse mountain ranges westwards from Abra La Raya on the Puno/Cuzco border. South of this barrier there is some variation in colours, males from outside the *coracinus* range in Bolivia showing more or less extensively black-streaked faces. However, this differentiation is too subtle for defining an additional subspecies.

Acknowledgements

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IN BRIEF

DISTRIBUTIONAL ERRORS IN "THE BIRDS OF LA PLATA ISLAND, ECUADOR" (ORTIZ-CRESPO & AGNEW 1992)

The recent paper by Ortiz-Crespo & Agnew (1992, *Bull. Brit. Orn. Cl.* 112: 66–73) on the birds of La Plata Island, Ecuador, usefully brings up to date our knowledge of the avifauna of that isolated island. Unfortunately two statements in their paper concerning distributional records in the "eastern Pacific" suggest that their familiarity with the literature of that region is confined to the waters off South America.

RED-FOOTED BOOBY *Sula sula*

The 20 individuals seen of this species are said (p. 69) to substantiate "that La Plata has the only colony of this species breeding in the entire eastern Pacific other than the one in the Galapagos." They have overlooked the colony on Cocos Island (5°32′N, 87°04′W), a possession of Costa Rica lying some 450 miles northeast of the Galapagos Archipelago (Slud 1967, *Bull. Am. Mus. Nat. Hist.* 134: 261–296). The species also breeds on several islands in the Revillagigedo Archipelago, which lies between 230 and 250 miles south of the tip of Baja California, Mexico. The colony on Isla San Benedicto in that archipelago, which I have visited twice, is of particular interest because the nests of this species, normally on bushes or small trees, are placed on shelves of the jagged and irregular pinnacles of a treeless lava delta. For the history of this colony, see Jehl & Parkes (1982, *Wilson Bull.* 94: 1–19). Both of these localities clearly lie in the "eastern Pacific".

GREAT FRIGATEBIRD *Fregata minor*

The authors state in their comparison of the La Plata and Galapagos avifaunas (p. 71) that the colony on Isla Genovesa, Galapagos, is "the only Great Frigatebird *Fregata minor* colony known in the eastern Pacific . . ." They have overlooked the colonies on the same islands as in the case of *Sula sula*. Slud (*loc. cit.*) pointed out that collected specimens verified field observations that the resident frigatebird on Cocos Island was *F. minor*. There were sight records of small numbers of Magnificent Frigatebirds *F. magnificens*, but no indication that this species also nested on Cocos Island. As for the Islas Revillagigedos, all authors writing of these islands through 1956 agreed that the breeding frigatebird was *F. minor* (in contradiction to the statement of Ortiz-Crespo & Agnew). R. L. Pitman of our 1978 expedition found about 50 individuals including newly fledged young roosting on the northwest side of Isla San Benedicto in 1978, and a colony of about 50 pairs (5 nests seen) on a steep cliff on the northwestern side of the island. At both Isla Socorro and Isla San Benedicto, 5-10 individuals of *F. magnificens* were seen in November 1974, April 1978, and April 1981. Furthermore, near the lava delta on San Benedicto in April 1978, both species were seen in about equal numbers. Two female *magnificens* collected there were in non-breeding condition and one was in heavy moult. However, a male *magnificens* collected at Bahía Academy, Isla Socorro, on 14 April 1978, had enlarged testes (19 × 13 mm). As frigatebirds do not normally wander far from the immediate area of nesting colonies, we believe that *F. magnificens* may well nest somewhere in the extensive areas of wooded habitat on Isla Socorro (Jehl & Parkes, *loc. cit.*). This would suggest that the Islas Revillagigedos may be the second known area, after the Galapagos, where *F. minor* and *F. magnificens* breed together, although the observations on Cocos Island at least hint at that location as a third area of sympatry.

Carnegie Museum of Natural History, KENNETH C. PARKES
4400 Forbes Avenue,
Pittsburgh, PA 15213,
U.S.A.

21 July 1992

BOOK RECEIVED

del Hoyo, J., Elliott, A. & Sargatal, J. (eds) 1992. *Handbook of the Birds of the World.* Vol. 1, Ostrich to Ducks. Pp. 696. 50 colour plates, numerous text-figures (all in colour) and maps. Lynx Edicions, Barcelona. ISBN 84-87334-10-5. £95. 32 × 25 cm.

One's first reaction to the advance publicity given to this book was amazement that anyone, or any group of people, should have dared to undertake anything so ambitious. How could competent authors be found to cover all aspects of all birds? How could even the keenest editorial team keep authors and artists to a deadline? How could a world handbook be kept within manageable size? But on reading the 18-page Introduction one is immediately impressed by the careful thought and planning that have made it possible to produce a highly satisfactory synthesis, of large but not unmanageable size, which presents a degree of detail adequate for most purposes, with a bibliography for each species enabling the reader to pursue enquiries further in the literature.

A 38-page section, dealing with the class Aves and constituting a useful summary of bird biology, follows the Introduction. This is followed by the main, systematic part of the book. The basic unit for organizing the text is the Family. Though there is some variation in the treatment (e.g. in the case of monospecific families, or families divided into well-marked subfamilies), each family account begins with a section dealing with general aspects under the headings: Systematics, Morphological Aspects, Habitat, General Habits, Voice, Food and Feeding, Breeding, Movements, Relationship with Man, Status and Conservation. The family accounts are richly illustrated with a superb selection of colour photographs, well reproduced. The species accounts follow; they summarize, also under standard headings, information relating to each species, if necessary with cross-reference to the family account, thus avoiding unnecessary duplication. Every species is illustrated in a colour plate (adult plumages only; the most distinct subspecies included), and each has a small but adequate distribution map, showing breeding and non-breeding ranges. The plates, which are the work of F. Jutglar, Ll. Sanz, A. Jutglar, J. Varela and Ll. Solé, are of the highest standard. The classification used is sensibly conservative, mainly following the Morony, Bock and Farrand *Reference Lists of Birds of the World* (1975).

Space prevents a listing of all the contributors to this work. Most are from Barcelona, as are the publishers; and the only item of text not in English is a brief dedication in Catalan, to Ramón Mascort. In giving full information on the conservation status of all species one of the aims of the work, which has been produced in collaboration with ICBP (now Birdlife International), is to promote the cause of avian conservation. If subsequent volumes appear without undue delays, it will also have succeeded magnificently in presenting the best, and most finely illustrated, account of the world's birds, thus superseding many lesser works. Homage to Catalonia!

NOTICE TO CONTRIBUTORS

Papers, from Club Members or non-members, should be sent to the Editor, Dr D. W. Snow, The Old Forge, Wingrave, Aylesbury, Bucks HP22 4PD, U.K., and must be offered solely to the *Bulletin*. They should be typed on one side of the paper, with **treble**-spacing and a wide margin, and submitted in duplicate. The style and lay-out should conform with usage in this or recent issues of the *Bulletin*.

A contributor is entitled to 10 free offprints of the pages of the *Bulletin* in which his contribution, if one page or more in length, appears. Additional offprints or offprints of contributions of less than one page may be ordered when the manuscript is submitted and will be charged for. Authors may be charged for proof corrections for which they are responsible.

BACK NUMBERS OF THE *BULLETIN*

Available on application to the Hon. Treasurer, as below (Vol. 93 onwards, 4 issues per year; Vols. 89–92, 6 issues per year; Vols. 89 and earlier, generally 9 issues per year): 1993 and after (Vols. 113 onwards) £4.50 each issue; 1983–92 (Vols. 103–112) £4 each issue; 1981–2 (Vols. 101 & 102) £3.50 each issue; 1980 (Vol. 100) *No. 1* £4.50, *Nos. 2, 3 & 4* £2.50 each issue; 1973–9 (Vols. 93–99) £2.50 each issue; 1969–72 (Vols. 89–92) £2 each issue; 1929–68 (Vols. 50–88) £1.20 each issue; Vol. 49 and before £2.50 each issue.

Indices: Vol. 70 and after £1.50 each; Vols. 50–69 £2.50 each; Vol. 49 and before £6 each.

Long runs (10 years or more) for Vol. 50 and after are available at reduced rates on enquiry. Postage and packing extra. Orders over £50 post free. Special issue Vol. 112A, 1992, in hardback, 300p, £32, inc. p&p.

MEMBERSHIP

Only Members of the British Ornithologists' Union are eligible to join the Club; applications should be sent to the Hon. Treasurer, as below, together with the annual subscription (£8.50 or, if preferred, U.S. $22 for 1993, postage and index free). Changes of address and any correspondence concerning membership should be addressed to the Hon. Treasurer.

SUBSCRIPTION TO THE *BULLETIN*

The *Bulletin* (Vol. 113 onwards) may be purchased by non-members on payment of the annual subscription (£18 or, if preferred, U.S. $40 for 1993, postage and index free). Applications should be sent to the Hon. Treasurer. Single issues may be obtained as back numbers.

PAYMENTS TO HON. TREASURER

Payments should be sent to the Hon. Treasurer, S. J. Farnsworth, Hammerkop, Frogmill, Hurley, Maidenhead, Berks SL6 5NL, U.K., or credited direct to the Club's bank account—No. 10211540, Sort Code 20 00 87, at Barclays Prime Account, P.O. Box 125, Northampton NN1 1SO, U.K., with confirmation to the Hon. Treasurer. All payments are net and should be in Sterling if possible. Payment in other currencies must include a further £3 for U.K. Bank Charges (except for annual rates in U.S. Dollars which are inclusive).

CORRESPONDENCE

Correspondence about Club Meetings and on all other matters should go to the Hon. Secretary, Mrs A. M. Moore, 1 Uppingham Road, Oakham, Rutland LE15 6JB, U.K.

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COMMITTEE

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Bulletin of the

British Ornithologists' Club

Edited by
Dr D. W. SNOW

Volume 113 No. 3 September 1993

FORTHCOMING MEETINGS

Tuesday, 19 October 1993. Dr Clive Mann will speak on "Bornean Birds". Dr Mann, who has spent 10 years in Borneo, will present an overview of the avifauna there. He will discuss its origins and describe some of its specialities. He is presently working on the BOU Checklist of the birds of Borneo.

Those wishing to attend are asked to notify the Hon. Secretary by Tuesday, 5 October 1993.*

Tuesday, 2 November 1993. Rod Martins will speak on "Where are the limits of the Western Palearctic?". Rod Martins has been a Council member of OSME since 1986 and was a member of the 1985 OSME Expedition to North Yemen. He is editor of *Turkey Bird Report* and has a particular interest in the status and distribution of birds in the Middle East.

Those wishing to attend are asked to notify the Hon. Secretary by Tuesday, 19 October 1993.*

Tuesday, 7 December 1993. John Fanshawe will speak on BirdLife research and conservation in the Arabuko-Sokoke Forest in East Africa. John Fanshawe is a Project Manager for BirdLife International (ICBP). He has just completed 3 years in Kenya and will present work undertaken in Arabuko-Sokoke. He is working on his doctorate, on the consequences of habitat modification for forest birds.

Those wishing to attend are asked to notify the Hon. Secretary by Tuesday, 23 November 1993.*

Tuesday, 18 January 1994. John Burton will show some films of ornithological interest which he has retrieved from the National Film Archive (B.F.I.).

Tuesday, 22 February 1994. Martin Woodcock will speak about 3 Tropical Forests—a montane and a lowland forest in East Africa and a montane forest in West Africa.

Meetings are held in the Sherfield Building of Imperial College, South Kensington, London at 6.15 p.m. for 7 p.m. A map showing Imperial College will be sent to members on request.

*Late acceptances and cancellations can usually be taken up to the Thursday morning preceding a meeting, although members are asked to accept by 14 days beforehand as arrangements for meetings have to be confirmed with Imperial College well in advance.

If you accept and subsequently find you are unable to attend please notify the Hon. Secretary, 1 Uppingham Road, Oakham, Rutland LE15 6JB (tel. 0572 722788) as soon as possible as the booking can often be offered to another member.

Bulletin of the BRITISH ORNITHOLOGISTS' CLUB

Vol. 113 No. 3 Published: 30 September 1993

ANNUAL GENERAL MEETING

The Annual General Meeting of the British Ornithologists' Club was held in the Ante-room of the Sherfield Building, Imperial College, London SW7 on Tuesday 18 May 1993 at 6 p.m. Mr R.E.F. Peal was in the Chair. 19 members were present.

The Minutes of the 1992 Annual General Meeting, which had been published (*Bull. Brit. Orn. Cl.* 112: 137–138), were approved and signed by the Chairman.

The Report of the Committee for 1992, which had been published in the *Bulletin*, was presented. The Accounts for 1992 were circulated at the meeting. The Honorary Treasurer said that the drop in interest rates had reduced the income of the Club. The sale of the freehold property was now complete and the proceeds had been invested. In the Centenary Year two extra publications, *Birds, Discovery and Conservation* and the *Bulletin* Volume 112A, had been produced.

The Honorary Secretary proposed, seconded by the Vice-chairman, that the Report and Accounts for 1992 should be adopted. This was carried unanimously.

The Editor said that because of financial restraints there might have to be some reduction in the number of pages in each issue of the *Bulletin*. It was hoped to maintain a publication delay of not more than 1 year. There had been a slight drop in the number of submissions in the last few months and the present position was therefore satisfactory. Recently there had been a concentration of papers on the Neotropics, and the *Bulletin* was well known in America as the journal where important data on Neotropical ornithology were published; but he hoped that it would be possible to restore a more balanced geographical coverage.

The Chairman said that the *Bulletin* had been picked out by the American Museum staff at the last I.O.C. for its presentation of new species, and this was a tribute to the editorship, previously of Dr James Monk and now of Dr David Snow. He felt sure that representations for more space would be as indulgently received as possible.

There being no additional nominations, the following were declared elected:

Chairman; D. Griffin (vice R. E. F. Peal)
Vice-chairman; The Reverend T. W. Gladwin (vice D. Griffin)
Hon. Secretary; Mrs A. M. Moore (re-elected)
Hon. Treasurer; S. J. Farnsworth (re-elected)
Committee; R. E. F. Peal (vice the Reverend T. W. Gladwin)

In announcing these elections the Chairman asked to be recorded his thanks to the Hon.Secretary for her most efficient administration., He expressed his gratitude to Mr Griffin for having generously stood aside for him to be Chairman for the last four years and his appreciation of the work of the Editors, Dr Monk and Dr Snow, and of the Hon.Treasurers, Mrs Bradley and Mr Farnsworth, during his term of office.

No other business had been notified in accordance with Rule 12.

The meeting closed at 6.15 p.m.

The eight hundred and twenty-ninth meeting of the club was held after the Annual General Meeting on Tuesday, 18 May 1993 in the Ante-room, Sherfield Building, Imperial College, at 6.15 p.m. 30 Members and 23 Guests attended.

Members attending were: D. Griffin (*Chairman*), M. A. Adcock, Dr J. R. Adler, Mrs D. Bradley, P. J. Bull, D. R. Calder, Dr M. Carswell, Professor R. Chandler, Dr R. A. Cheke, J. H. Elgood, S. J. Farnsworth, A. Gibbs, Revd T. W. Gladwin, B. Gray, C. A. R. Helm, M. C. Jennings, Ms R.-M. Jones, R. Kettle, Dr J. F. Monk, D. J. Montier, Mrs A. M. Moore, R. G. Morgan, P. J. Oliver, R. E. F. Peal, Dr N. Skinner, Dr D. W. Snow, N. H. F. Stone, Professor W. E. Waters, C. E. Wheeler, M. W. Woodcock.

Guests attending were: Dr A. Lewis (*Speaker*), Mrs B. Adcock, Miss J. Alexander, K. Blundell, Mrs M. Bull, Mrs J. Calder, Mrs F. Farnsworth, J. Gilby, Mrs J. Gladwin, Mrs S. Griffin, J. B. Heigham, A. J. Holcombe, Mrs A. J. Holcombe, Mrs D. Monk, Mrs M. Montier, P. J. Moore, Mrs A. Nason, Mrs E. Peal, A. Robertson, D. Russell, Dr C. Ryall, R. Webb, Mrs B. Woodcock.

After supper Dr Monk paid tribute to Mr Peal who had retired at the end of his term of office as Chairman for the past 4 years. Dr Monk said that, as Chairman and as Honorary Secretary for 18 years before that, Mr Peal had given quite outstanding service to the Club. When he had first taken office the membership and the finances of the Club had been in decline and it was largely due to his unstinting work that both are in such good health today. He presented Mr Peal with a watercolour of a Wryneck *Jynx torquilla* by Mr Robert Gillmor, commissioned by past and present members of the Committee of the Club to mark Mr Peal's retirement.

The address was given by Dr Adrian Lewis on the compilation of the Kenya Bird Atlas. With an area about twice that of the U.K. and some 1070 bird species, comparatively few of which are vagrants, Kenya's avifauna is one of the richest in Africa. This richness derives from Kenya's intense habitat diversity, coupled with its location at the junction of several of the Afrotropical Region's major avifaunal realms. The project to atlas Kenya's bird species ran from 1981 to 1989 and involved more than 200 active observers, as well as collecting data from published sources, nest record cards and museum collections. These records were plotted onto a quarter square degree (QSD) geographical grid for the periods prior and subsequent to 1 January 1970 and statistically analysed for correlation with such factors as altitude, rainfall, a moisture index, and also water body and vegetation types.

The degree of coverage that the study achieved was assessed in two ways. A multiple linear-regression was used to estimate the maximum number of species to be expected in each QSD. This regression takes into account the altitudinal variation, the types of water body and the observer effort present within a square, and is highly significant statistically. Division of the species total recorded for a square by its predicted maximum yields a percentage that reflects the thoroughness with which the square's avifauna has been covered. Secondly, the completeness of each species' map is assessed by its DC numbers. D stands for Detectability which, on a scale of 0 to 3, indicates the ease with which the bird may be detected *and* identified e.g. Common Bulbul=3, small members of *Indicator*=0. C stands for Coverage which, on a similar scale, signifies the estimated coverage achieved of the species' range, e.g. the maps of rare/skulking species or those inhabiting infrequently visited areas have low C numbers.

The atlas project was a success (a) because the contributors' enthusiasm and drive were kept at high levels by personal (never duplicated) correspondence, and by frequent progress reports; and (b) because the details of the ranges of most of Kenya's birds are apparent at the relatively coarse QSD scale.

THE CHAIRMAN'S ADDRESS

(given at the meeting of the Club on 27 April 1993)

BRITISH ORNITHOLOGISTS' CLUB 1968–1992

I spoke three years ago on "Progress of the Club in the last 50 years" (*Bull. Brit. Orn. Cl.* 110: 114–121). I happen to have been on the Committee since 1969 and I am going now to deal with some aspects of the Club's evolution in the last 25 years not covered to an appreciable extent then.

In 1969, the Chairman, Dr James Monk, was one year into his three-year term of office, as was Sir Hugh Elliott, the vice-Chairman. J. J. Yealland, the Editor, had been elected in 1961 to take office on 1 June the next year and under the Rules this was for a five-year term only. The passage of time apparently passed unnoticed as he was still in office in 1968, when he told the Committee that he wished to retire at the end of that year, later agreeing to continue for a further three months.

The Club had had a crisis in 1950/1951, when meetings were flourishing but the *Bulletin* had almost faded out: it was revived by a new Editor, Dr Jeffery Harrison, who changed the nature of its content. In 1968 attendances at meetings had fallen 38% in the previous 4 years and that year there were fewer than 20 people at three of the eight Club meetings. The *Bulletin* had nine issues a year, most of 16 pages with about six papers an issue, chiefly on apparently minor taxonomic matters; it was for reference in libraries rather than something one read. It looked dull and it was. It needed a change. Some "senior members" considered that the small number of members who attended meetings were saddled with responsibility for publication of the *Bulletin* and suggested that there might be insufficient material to justify its publication at all. Suggestions were that publication of the *Bulletin* should cease or that it should become the joint responsibility of the Club and the B.O.U., the Club's assets being put at the disposal of the B.O.U. towards the costs of the *Bulletin*; in either case the Club would continue to hold meetings.

The Chairman, Dr Monk, recognized that action was needed and a memorandum and questionnaire were sent to members in September 1968, about 55 being returned. About two-thirds wanted negotiation with the B.O.U. about the *Bulletin* and one-third that the *Bulletin* should continue as it was. Over half would remain members if there were no *Bulletin*. There was no consensus on whether the number of meetings should be maintained or reduced. There were questions asking members if they would be willing to serve as Secretary, Treasurer or Editor and there were nine willing to be Editor (including C. W. Benson). As for me, I replied that I was not willing to take office in the Club—which confirms my experience in life: don't trouble to volunteer for a hot seat—if it is the will of God that you shall be in it, you'll end up in it just the same.

The subject was then discussed at the Club meeting the next month, attended by 19 members and 3 guests, which continued until 10.10 p.m. Dr Monk's file is in the Club's archives and he concluded that there was no clear call for the Club to discard the *Bulletin* but a firm suggestion that it should be published about six times a year and meetings probably likewise; also that there was a general dissatisfaction with price and standard of dinners at the Rembrandt. Decisions were taken accordingly; each of the six *Bulletin* issues was to have 32 or fewer pages, meetings were to be held six times a year, not at the Rembrandt, alternately dinners and suppers. The Committee's first choice as Editor was C. M. N. White (in Zambia) but it was Con Benson whom they nominated. He was elected at the 1969 A.G.M. and proved an excellent Editor, experienced both in field and museum. The objection to the Rembrandt, other than to the price (not recorded, but £1.25 in 1965), was to noise from functions in adjoining rooms and from the kitchen. The evening of the 1969 A.G.M., at which I was elected to the Committee, was our last at the Rembrandt and we then normally met, with dinner, at the Criterion.

At the 1971 A.G.M. Sir Hugh Elliott was elected Chairman, J. H. Elgood as Vice-Chairman, and I as Hon. Secretary. The next meeting, in June at the Cafe Royal, was the first I arranged and cost £1.50+ 12½% service for our customary three courses and coffee. The Criterion closed soon after we met there in May 1972 and our meetings were then all held at the Cafe Royal, which was under the same ownership. They agreed to continue the Criterion price of £1.75 (+VAT, when it came into force) although their minimum was otherwise £2. Exceptionally, in July 1974 we went to Imperial College, where we had two speakers in a lecture theatre, one before and one after a buffet supper in the Senior Common Room costing £1.82. To go there was the suggestion of Dr Amicia Melland, Administrative Secretary of the B.O.U., and we were vouched for by Dr T. J. Seller. In July 1975 either the West End was more prosperous or money falling in value particularly fast, as the Cafe Royal minimum charge was raised almost 50% and the cheapest wine to £3 a bottle. The hunt was on for alternatives and we repaired to Imperial College for the second half of that year. However, small numbers counted against us as Imperial College expected a normal minimum of 25 and an absolute minimum of 20. So we then alternated between there, for meetings at which our larger numbers were expected, and a private room at the "Goat" in Stafford Street, W1 for others, especially if no slides were to be shown. The "Goat" was cheaper but it would only hold 35 to 40 with a very considerable squeeze and no slide projection and 10 fewer if there were slides. Gradually numbers rose and we last met at the "Goat" in July 1979, after that having all meetings at Imperial College in the Senior Common Room, Prince's Gardens. In 1981–1983 prices there rose 55% and numbers at meetings fell, so in 1984 we twice had suppers, a new option then, £2 or more cheaper than a three course dinner. In 1986 the Senior Common Room in Prince's Gardens had been closed and we moved to Sherfield Building.

When we met at the Rembrandt, our projectors and screen were kept between meetings at the Natural History Museum and we employed a projectionist to operate them. One blessing of meeting at a West End restaurant was that they stored our screen and the "Goat" provided one for our use there. However, the Hon. Secretary always had to carry our projector to and from meetings and Mrs B. P. Hall very kindly gave the Club £100 when we left the Rembrandt with which to buy a new projector that was much lighter than its predecessor and superior in use. Imperial College stored neither projector nor screen, so I had to convey both to and from meetings there. Happily, in November 1979, when I had just moved to Sevenoaks, Mrs Diana Bradley, the Hon. Treasurer, kindly offered to transport them to and from meetings until early 1989, when Dr R. J. Chandler, to whom we are most grateful, arranged to store them for us at Imperial College.

My predecessor as Chairman, Revd G. K. McCulloch, in September 1988 reintroduced Short Communications at meetings before the main speaker. However, in 1990 there was a request by a senior member for meetings to finish by 9 p.m. instead of by 9.30 or 9.45 as was customary. That would have involved cutting heavily the time for speakers, let alone questions, but trying to finish as early as practicable did mean cutting out Short Communications; but that is a step which can be reviewed, if desired.

The changes from nine numbers of the *Bulletin* a year to six in 1969 and then to four in 1973 have been excellent. The size of the *Bulletin* was fixed in 1972 at 172 pages plus 4 for the Report and Accounts, which had for the previous four years been published as a separate broadsheet, an unfortunate break in the Club's published records. In 1970, to save £9 a year, the *Bulletin* covers for the whole year were printed in a single operation, almost certainly the poorest piece of economy the Club has ever adopted, as it meant that the date and number of each issue were not on the cover (nor could the list of Committee members be updated). In 1975 the number of pages was reduced to 144, but by 1981 improvement in the Club's finances made an increase possible. It was decided in 1987, after long negotiations, to transfer printing of the *Bulletin* to Henry Ling Limited despite good relations for many years with Caxton & Holmesdale Press, as for 192 pages a year there was a saving of 24% (£1360) annually. From Vol. 112A and Vol. 113 No. 1 the *Bulletin* has been printed on acid-free paper, a change not previously announced.

The Rules were reprinted in the *Bulletin* Index for 1982, the first time for 23 years. The many changes made to them over the years had made them read very awkwardly in places and it was decided to replace them with a new set of Rules. Committee members had many ideas of what they wanted but after the Chairman, Revd G. K. McCulloch, using his knowledge as a barrister, and I had produced a final draft in the light of views expressed and the need for clarity, unanimity was achieved and the new set of Rules was approved at the A.G.M. in 1988.

A list of Club members, with addresses, had been published in the *Bulletin* Index annually up to Vol. 69 (1948–1949) and then in Vols 74 and 79. The need for it arose again, because the B.O.U. ceased after 1982 to publish a list of members. The production of one by the Club after a long gap proved, as the B.O.U. was finding, a major work, but Mrs Bradley and I produced a current list for publication in the Index to Vol. 107 (1987). As annual production greatly eases the work, and it is of considerable value, a corrected list has been published every year since. A List of Contents has been printed on the outside back cover of each number of the *Bulletin* from 1982, a great benefit to readers. The *Bulletin* mailing list was put by Mrs Bradley on her computer in 1985, and from March 1986 she supplied the printers with gummed labels, thereby eliminating a source of errors.

There have been many changes since 1928 in the provision of free copies to authors of papers, some authorized, some not. From 1964 to 1969 they were given 30 free copies of the entire *Bulletin* in which their paper appeared. As the print run was a constant number, probably 900 copies, if a large number were needed for authors there were few left for stock. By 1971 Sir Hugh Elliott was finding that we were running out of some issues of the 1960s and we reprinted as necessary. As there was a demand for earlier issues, including many out of print, we have since then reprinted very many and now have all volumes in stock back to Vol. 33 (1913–1914) and several earlier ones. The promotion of membership and of *Bulletin* sales, both current subscriptions and back numbers, has been a continuing operation, especially for the last 20 years. As it is a general experience that scientific journal subscriptions are falling at around 2% a year, it is a matter of having to run to stay still. Thus our (non-member) subscribers peaked in 1981 at 194 and were 147 last year. The Club has in the past set a single rate for subscribers, but as membership is open only to B.O.U. members, there is a case for considering different rates for individual and for institutional subscribers, as a number of other societies do.

The home of Herbert Stevens at Tring, bequeathed conditionally to the Club in 1964, became available with vacant possession in April 1991. The house with some of the garden was sold in September 1991 for £70,000 and the rest of the land in June 1992 for £79,000. Steps were taken at the 1992 A.G.M. for the appointment of trustees to hold

TABLE 1
Summary of statistics, British Onithologists' Club

	1952	1971	1992
No. of members	191	229	594
Attendances at meetings	491	138	463
No. of B.O.U. members	725	1634	1789
No. of non-member subscribers	65	*c.*80	147
Bulletin:			
No. of pages	118	190	312
Cost per page £	2.93	5.26	39.32
Member's subscription			
£	1.05	2.50	8.50
SwFr	12.80	24.90	18.75
US$	2.95	6.38	12.83
Retail prices	1.00	2.06	26.84

The figures for foreign currencies and for retail prices are for December in the respective years the net proceeds of the property and contents, for investment with a view to maintenance of the real value of the fund in the long term, and a corresponding income to the Club.

Table 1 gives some figures concerning the Club for 1971 and 1992, together with 1952 to show a longer span, and I close with comparisons of 1971 (when I became Hon. Secretary) with 1992. Membership has more than doubled and, what is more, the proportion of B.O.U. members that belong to the Club—and they are our only source of members—has risen from 1 in 7 to 1 in 3. Attendances at meetings have risen by $3\frac{1}{3}$ times, rather more than the rate of increase in the Club membership. *Bulletin* pages published in the year (excluding Vol. 112A) are up 1.6 times but the mean cost per page has risen nearly $7\frac{1}{2}$ times—it about trebled in the six years from 1971 to 1977, and compares with a rise in the retail price index of 13 times from 1971 to 1993. Non-member subscribers are nearly double the number that there were then and the cost of a member's subscription in a hard currency, e.g. Swiss Francs, is less than it was in 1971.

British Ornithologists' Club
Income and Expenditure accounts for the year ended 31 December 1992

	1992		1991	
	£	£	£	£
INCOME				
Subscriptions received				
Members	5,040		3,610	
Non-member Subscribers	2,738		2,433	
Less: Subscription recruitment expenses	—		(13)	
		7,778		6,030
Donations received		17		143
Investment income				
Stevens Bequest Fund:				
COIF 2 Interest	10,227		2,101	
Barrington Trust Fund (COIF Income Shares)	33		32	
Interest received:				
Barclays Prime Account	313		618	
Barclays Prime (Centenary) Account	97		—	
Lloyds High Interest Cheque Account	—		52	
COIF Deposit Account	3,222		4,032	
		13,892		6,835
Property				
Clovelly—Rent	—		585	
Insurance refund	—		17	
Capitalisation of Legal Fees arising in 1989 and 1990 re planning permission	2,143		—	
		2,143		602
Income Tax recovered				
Deeds of Covenant		324		221
Bulletin back numbers				
Sales	126		206	
Less: distribution costs	(15)		(30)	
		111		176
Cost of sales (Bulletin)				
Opening stock	(100)		(100)	
Closing stock	100		100	
		—		—

	1992		1991	
	£	£	£	£
Meetings				
Income	3,137		2,992	
Less: Restaurant charges	(3,413)		(2,817)	
Speakers' expenses/notices etc	(289)		(252)	
		(565)		(147)
Centenary Dinner				
Income	2,548		—	
Less: Restaurant/hall hire	(3,138)		—	
Notices etc	(139)		—	
		(729)		—
Club ties				
Sales	639		—	
Less: Opening stock	(300)		—	
Purchases	—		(936)	
Closing stock	—		300	
Notices etc	(69)		—	
		270		(636)
		23,241		13,224
EXPENDITURE				
Bulletin BOC				
Publication and printing	9,380		7,690	
Additional offprints (separates)	238		140	
	9,618		7,830	
Less: Offprint sales	(110)		(193)	
Authors' contributions	(155)		(448)	
	9,353		7,189	
Editor's honorarium	750		750	
Editorial and secretarial expenses	85		145	
Address labels	651		551	
Postage	1,430		1,307	
	12,269		9,942	
Special Centenary Issue Vol 112A				
Publication and printing	10,489		—	
Additional offprints (separates)	580		—	
	11,069		—	
Less: Sales (excluding offprints)	(1,799)		—	
Offprint sales	(170)		—	
	9,100		—	
Editorial expenses	139		—	
Notices etc	257		37	
Postage	652		—	
	10,148		37	
Contribution to "Birds, Discovery and Conservation"				
Publication and printing	5,372		—	
Less: Sales	(3,110)		—	
Donations	(750)		—	
	1,512		—	
Notices	68		—	
Postage	250		—	
	1,830		—	
Projection equipment—depreciation	10		—	
Sound equipment	—		50	
	10		50	

	1992		1991	
	£	£	£	£
Committee Administration				
Postage	330		428	
Stationery and printing	676		514	
Secretarial	—		118	
Telephone	369		250	
	1,375		1,310	
Insurances	50		90	
Accountancy	967		646	
Bank charges	55		18	
Credit card charges	124		11	
Miscellaneous	124		95	
	1,320		860	
Total expenditure		26,952		12,199
Excess of Expenditure over Income		(3,711)		1,025

British Ornithologists' Club
Balance Sheet as at 31 December 1992

	1992			1991
	£	£	£	£
General Fund				
Balance at 1 January 1992	33,228		32,203	
Less: Excess of expenditure over income	(3,711)		1,025	
Balance at 31 December 1992		29,517		33,228
Barrington Trust Fund				
Balance at 1 January 1992 & at 31 December 1992		577		577
Stevens Bequest Fund				
Balance at 1 January 1992	157,747		92,568	
(Loss)/Profit on sale of Freehold Property	(12,730)		62,668	
Sale of Chattels—Net	—		2,511	
Balance at 31 December 1992		145,017		157,747
		175,111		191,552
Represented by:				
Barrington Trust Fund Investment				
Charity Fund 111.57 COIF Income shares		577		577
Stevens Bequest Fund Investment				
Freehold Property (Building Plots)	—		85,000	
COIF No. 2 Account	145,017		72,485	
		145,017		157,485
Fixed Assets				
Projection Equipment		90		100
Current Assets				
Stock of *Bulletin*	100		100	
Stock of Ties	—		300	
Cash in Hand	13		44	
Cash at Bank				
—Barclays Prime Account	17,837		6,007	
—Barclays Prime (Centenary) Account	132		—	
—Lloyds Current Account	23		2	
—Post Office Giro Account	116		37	

	1992		1991	
	£	£	£	£
Cash at Bank *continued*				
—COIF Deposit Account	19,195		35,564	
—COIF No 2 Account	14,429		—	
Sundry Debtors	26		291	
		51,871		42,345
Current Liabilities				
Subscriptions received in advance				
—Members	1,686		1,998	
—Non-member Subscribers	1,723		1,404	
—Members 1992 refund	17		—	
Sundry Creditors	19,018		5,553	
		(22,444)		(8,955)
		175,111		191,552

AUDITORS' REPORT

To the Members of

BRITISH ORNITHOLOGISTS' CLUB

We have audited the financial statements in accordance with Auditing Standards.

In our opinion the financial statements give a true and fair view of the state of the Charity's affairs at 31 December 1992 and of its Income and Expenditure for the year then ended.

Prince Albert House
20 King Street
Maidenhead, Berks
18 May 1993

DONALD REID & CO.,
Registered Auditors

Approved by the Committee on 18 May 1993
R. E. F. PEAL, Chairman

Birds of the cold tropics: Dokfuma, Star Mountains, New Guinea

by P. A. Gregory & G. R. Johnston

Received 24 June 1992

Introduction

Altitude is the most important ecological sorting mechanism acting upon the New Guinean avifauna (Diamond 1972). It is surprising, therefore, that relatively little has been published about the birds occurring at very high altitudes in alpine and subalpine habitats (Smith 1980). High-altitude bird communities are known to be depauperate (Diamond 1972), but are of particular interest because they occur in highly discontinuous habitats which harbour relictual populations of several species. The low diversity of these communities is reflected in very coarse niche differences between taxa; the few species in any high-altitude avian community generally belong to different genera or even families (Diamond 1972). Indeed, hitherto, no more than two congeners were definitely known to coexist at the same altitude above 2000 m. This contrasts with the situation below 1000 m where 4 to 8 congeners may exist in sympatry.

Dokfuma is a subalpine herbfield situated on the southern slopes of Mount Capella in the Star Mountains (5°01′S, 141°07′E) in the West Sepik Province at an altitude of 3200 m. The herbfield has developed in a frost hollow with gentle slopes and is approximately two square kilometres in area. The valley floor is covered by a dense mat of ferns, with small stands of tree ferns and stunted *Rhododendron* shrubs. The margins of the valley support an open *Dacrycarpus* woodland. *Phyllocladus, Papuacedrus* and *Schefflera* are common in this woodland. In sheltered areas there are stands of dense, extremely mossy, Upper Montane Forest (Paijmans 1976). The region is uninhabited by humans but is crossed by the Busilmin-Tabubil walking trail.

Despite extensive early field work on birds in the Snow Mountains (Archbold *et al.* 1942) and the Victor Emmanuel and Hindenberg Ranges (Gilliard & LeCroy 1960) no ornithologist appears to have visited Dokfuma. The area was visited in April 1987 by a team of mammalogists and herpetologists from the Australian Museum (Flannery 1987) who made opportunistic observations on birds and reported MacGregor's Bird of Paradise *Macgregoria pulchra* and the Western Alpine Mannikin *Lonchura montana*, the latter for the first time in Papua New Guinea.

Dokfuma is of particular ornithological interest as it is close to the eastern limit of several bird species known to occur in nearby Irian Jaya, but not yet known from Papua New Guinea (Beehler *et al.* 1986, Coates 1990). Furthermore, the only locality at which more than two high-altitude congeneric species have been reported to occur in sympatry is on the northern slopes of the Snow Mountains (Diamond 1972). If three congeners do occur together in the Snow Mountains, one might expect this situation at Dokfuma also, for reasons of geographic proximity.

We visited Dokfuma between 16 and 19 November 1991 and camped at the same site as the 1987 Australian Museum expedition (GR158463, Ok Tedi 1:100,000 map sheet 7187). During our stay weather conditions varied from complete fog to a clear sky. Temperatures varied from 1°C at night to 18°C by day. This paper outlines our observations on the birds of the area based on 45 hours of observations by two observers.

Systematic list

SNIPE *Gallinago* sp.

Six snipe were flushed from a patch of long grass in the valley on 17 November. They were still present on 18 November. A *scaap* call was given. This was the only migratory bird seen at Dokfuma and appeared to be same as the snipe seen in Tabubil a few days prior to our visit to Dokfuma. This is presumably Swinhoe's Snipe *G. megala*.

WHISKERED LORIKEET *Oreopsittacus arfaki*

A flock of three flew overhead at the northern end of the valley on 16 November. Quiet *tsit* calls revealed 4 birds feeding in a fruiting *Schefflera* sp. on the afternoon of 17 November. Two flew over a waterfall at the west end of the valley on the 18th.

FAN-TAILED CUCKOO *Cacomantis flabelliformis*

Heard calling daily. One observed on 17 November.

MOUNTAIN SWIFTLET *Collocalia hirundinacea*

Frequently seen over the open herbfields. Assumed to be this species on the basis of altitude.

GLOSSY SWIFTLET *Collocalia esculenta*

Frequently seen over the shallow tree-lined gullies which ran into Dokfuma herbfield.

ALPINE PIPIT *Anthus gutturalis*

A pair of birds building a nest in the valley; carrying grass strands into longish grass. Perched on tree ferns, and often foraged down in their flat crowns. Observed in the company of Western Alpine Mannikins on several occasions.

HOODED CUCKOO-SHRIKE *Coracina longicauda*

A pair of birds were observed to fly across a shallow gully at the northern end of the valley and alight on the edge of the open woodland.

ISLAND THRUSH *Turdus poliocephalus*

Adults were frequently observed along the forest edge. A juvenile bird was observed on western edge of the valley on 16 November.

NEW GUINEA THORNBILL *Acanthiza murina*

A very inquisitive species which investigated 'squeaking' and gave excellent views. Several were seen either in small flocks or in pairs, giving a noisy, high-pitched, sibilant twittering call; also a buzzy, high-pitched *chwee shtup shtup* song from mid canopy.

DIMORPHIC FANTAIL *Rhipidura brachyrhyncha*

A pair observed in association with Lorentz's Whistlers on 17 November at the northern end of the valley in moss forest at the edge of a deep doline (sink-hole). A female in scrub forest behind camp on the same date.

MOUNTAIN ROBIN *Petroica bivittata*

Two small black and white robins with a high-pitched *see-see-see-see* call, perching high in trees. White underparts; black chin and throat. One individual seemed to have a black chin, whereas the other had black on throat as well. Black above with a small white wing-bar. One bird may have had a tiny white loral spot, the other lacked it. A considerable range extension, filling an apparent gap between Snow Mountains and central highlands populations.

LORENTZ'S WHISTLER *Pachycephala lorentzi*

Two birds on forest edge in late afternoon on 16 November. One individual with grey head, olive mantle, whitish chin, throat and chest, greyish belly and a pale yellow undertail area only. This bird appeared to be an immature, and was associated with a second, clearly an adult with grey head, white chin, throat and chest with greyish pectoral band; olive green mantle, wings and tail; underparts rich yellow; bill small, fine, dark; eyes and legs dark. Another pair of adults in open forest at the western edge of the valley on 16 November. Quite tame, responded well to 'squeaking'; rather robin-like. A group of three observed on the 17th at the northern end of the valley in moss forest on the edge of a doline. One of these was an immature with similar coloration to that described above. The presumed immature plumage is not listed in either Coates (1990) or Beehler *et al.* (1986). Occurred in the mid stratum of moss forest or tops of saplings in clearings.

BLACK SITTELLA *Daphoenositta miranda*

A noisy twittering flock of 15 low down in bushes on 17 November. Female with dull, pinky-red forehead, chin and undertail; eyes and legs yellow. A pair observed on the 18th in a gully to the east of camp, high in a tree. Another flock of five birds flew from low vegetation (2 m) high into the canopy of a tree on the 18th.

CRESTED BERRYPECKER *Paramythia montium*

This species proved to be quite common, skulking around in bushes, and was generally fairly confiding. Call a nasal *zek*. One was observed high in trees from camp on most days.

RED-COLLARED MYZOMELA *Myzomela rosenbergii*

Two males observed on 17 November, and three males on the 18th. A single bird called continuously from an exposed branch east of camp on the 18th, a very high-pitched, prolonged *tsi*. A noisy, canopy frequenting species.

BLACK-THROATED HONEYEATER *Lichenostomus subfrenatus*

The most conspicuous species found at Dokfuma, calling and singing noisily. Adults were observed feeding fledglings on 16 November. Individual birds appeared to have two main calls. The one most often uttered was a complicated, tuneful series of whistles, which could be heard from some distance away. While feeding young or disturbed by observers a harsh churring sound was produced. A noisy, bubbling song, rising and falling in pitch, was often given by several birds together. Loud, harsh *wit* calls were given when near the juvenile.

SOOTY MELIDECTES *Melidectes fuscus*

A blackish melidectes in undergrowth, lacking a beard; tail not cocked; not mottled beneath, and had a blueish-white patch behind the eye, which was more extensive than that of *M. nouhuysi*. Two individuals seen on 17 November.

SHORT-BEARDED MELIDECTES *Melidectes nouhuysi*

Not uncommon along forest margins, low down in fringing vegetation. A large blackish honeyeater with a long slightly down-curved, dark bill, rather longer than shown by Beehler *et al.* (1986) and a prominent, forked, white beard, often standing out from neck, not reaching anywhere near the bend of the wing. Mottled paler on belly and under tail; small, golden yellow skin patch behind eye. Tail often flicked-up at 45 degrees. Keeping to bushy scrub mostly. Call a metallic *pwik* and a thin *weet-weet* flight-note. Chased by the smaller, more aggressive Black-throated Honeyeater right up into the canopy on one occasion.

BELFORD'S MELIDECTES *Melidectes belfordi*

A noisy melidectes heard calling at the southern end of the herbfield was presumably Belford's at this altitude.

WESTERN ALPINE MANNIKIN *Lonchura montana*

Eight adults near an old camp on the western side of the valley, and two later sightings each of two adults further down the meadow. Fairly tame. Often seemed to be found with the Alpine Pipit. Call a monotonous *tyu* series.

MOUNTAIN FIRETAIL *Oreostruthus fuliginosus*

A female above the old camp on the western side of the valley on 17 November was the sole sighting.

MACGREGOR'S BIRD OF PARADISE *Macgregoria pulchra*

At least one pair was seen on several occasions in forest at the southern end of the valley. They seemed to have a territory about 1 km long and a few hundred metres wide, as they continually flew up a ridge then came over the top and back down onto lower slopes. On one occasion one of this pair chased another, third individual from this area. Wing noise in flight was reminiscent of a duck at close range and was audible over a distance of several hundred metres. Strange *nyeh nyeh nyeh* call. Observed several times with green berries in bill. Legs whitish and stood out from black of

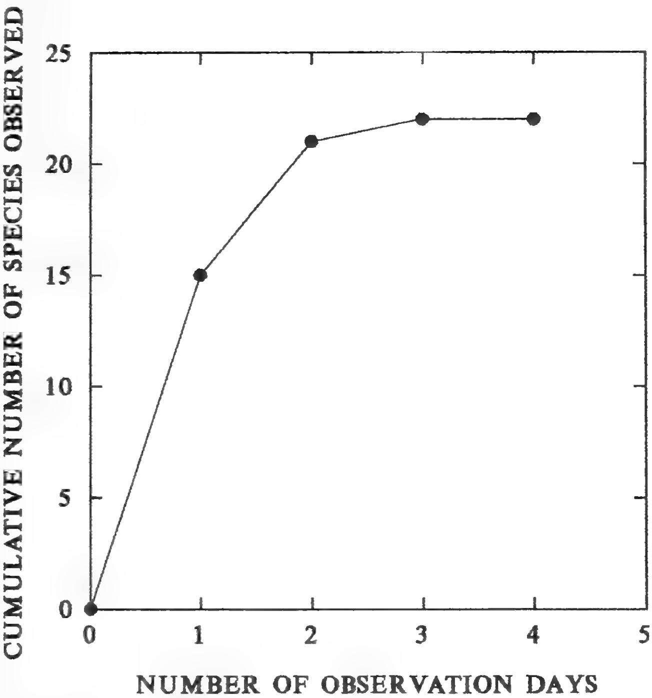

Figure 1. Cumulative number of bird species observed over a four-day period at Dokfuma, West Sepik Province, Papua New Guinea.

body, unlike illustrations (Beehler *et al.* 1986, Plate 54). The facial wattle of one bird was brilliant sunset orange on one day. On the following day a bird was observed with an intense, but duller, yellow facial wattle. We suspect that this variation may have occurred in one individual, in which case it may be analogous to the colour changes in the facial wattle of the Smoky Honeyeater *Melipotes fumigatus*, and requires further observation.

Discussion

A total of 22 species of birds in 16 families were observed or heard over four days at Dokfuma. While there are some species which might be expected to occur at this locality but were not observed (e.g. Archbold's Owlet Nightjar *Aegotheles archboldi*), this figure compares well with the complexity of bird communities found in other areas of high altitude in eastern Papua New Guinea (Diamond 1972, Beehler *et al.* 1987). A plot of the cumulative number of species observed over the four days shows a distinct plateau, suggesting that this list is reasonably complete (Fig. 1).

Most families were represented by one species at Dokfuma. This pattern of taxonomic diversity presumably reflects the coarse pattern of niche difference found in other high-altitude bird communities (Diamond 1972). The notable exception to this was the five species of honeyeaters (Meliphagidae). This reflects the enormous radiation of this family in the Australopapuan region.

The Red-collared Myzomela *Myzomela rosenbergii* and Black-throated Honeyeater *Lichenostomus subfrenatus* are widespread high-altitude forms and were not unexpected at Dokfuma. The co-existence of three species of *Melidectes*, which are all of similar size (Beehler *et al.* 1986), is of special interest. It confirms that more than two species within this genus can live in sympatry at high altitude. This has been reported only once previously, from the Snow Mountains in Irian Jaya, and is contrary to the general pattern that only two species occur together over most of New Guinea (Diamond 1972).

The occurrence of the Short-bearded Melidectes *Melidectes nouhuysi* at Dokfuma is particularly noteworthy as it is the first record of this species from Papua New Guinea. Previously *M. nouhuysi* was known only from the Snow Mountains. The birds observed at Dokfuma had a slightly longer 'beard' than illustrated for this species by Beehler *et al.* (1986). The possibility, therefore, exists that this population represents a form intermediate between *M. nouhuysi* and the closely related Long-bearded Melidectes *M. princeps*.

Flannery & Seri (1990) noted that the Upper Montane mammalian fauna in the West Sepik Province contains many species distributed in western New Guinea, all of which have closely related populations to the east. This pattern occurs among some of the birds found at Dokfuma, viz. Mountain Robin *Petroica bivittata*, MacGregor's Bird of Paradise *Macgregoria pulchra*, Western Alpine Mannikin *Lonchura montana* and Short-bearded Melidectes *Melidectes nouhuysi*. The occurrence of these species at Dokfuma reduces the distance isolating the eastern and western populations or species pairs. One clear inference from this is that more survey work between the Dokfuma-Telefomin area and Mount Hagen is needed to determine whether there are populations of high-altitude bird species linking eastern highlands populations with those of the Star and Snow Mountains.

Summary

Twenty-two species of bird are listed as occurring at Dokfuma, a subalpine herbfield in West Sepik Province, Papua New Guinea, at an altitude of 3200 m. One of these, *Melidectes nouhuysi*, is reported from Papua New Guinea for the first time. Three species of *Melidectes* occur in sympatry at Dokfuma, whereas only two species of this genus occur together in most high altitude habitats. The occurrence of several species at Dokfuma reduces the distance between closely related populations, previously known from the Snow Mountains in Irian Jaya, to the west, and the eastern highlands of Papua New Guinea.

Acknowledgements

Rob Lachlan, Steve Richards and Karoli accompanied us in the field. Murray Eagle and Ross Smith (Environment Department, Ok Tedi Mining Company Ltd) provided logistic support and transport by helicopter. Mike Bull passed comments on the manuscript.

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Some records of birds from Belize, Central America, including three first records

by R. Walters

Received 29 June 1992

Russell's (1964) monograph has for many years been the standard work on the avifauna of Belize, formally British Honduras. Further information is contained in Barlow *et al*. (1969, 1970, 1972), Erickson (1977), Kiff & Kiff (1974) and Wood & Leberman (1987). An annotated checklist (Scott Wood *et al*. 1986) gives brief distributional and abundance details of all species known to have occurred in Belize up to the end of 1985.

Whilst researching the history of banding in Belize, I also found several significant records, which pre-date the checklist. I found a later occurrence of one species, which I repeat here as the publication in which it is recorded has a limited distribution. Except where stated, all instances of banding were carried out by W. P. Nickell. Nickell was an experienced bander, with considerable experience in the northern Neotropics. He took part in six expeditions to Belize between 1960 and 1965 (Nickell 1968).

To eliminate the possibility of input error, all computer records were verified against the original banding schedules. Sequence and nomenclature follow A. O. U. (1983).

NORTHERN PYGMY-OWL *Glaucidium gnoma*

This species is not listed by Russell (1964) or Scott Wood *et al*. (1986). A single individual of this species was banded at San Antonio, Cayo District, on 24 February 1960. On 8 March 1986, a Royal Air Force

Ornithological Society expedition netted and banded another near Guacamallo Bridge, approximately 24 km south of San Antonio (Counsell 1988). In Guatemala this owl is recorded as an uncommon resident of pine and oak woodland in the highlands, ranging down into the sub-tropics (Land 1970). In Honduras it is reported as an uncommon resident of highland pine and cloud forest (Monroe 1968). The areas where both individuals were trapped in Belize fall within the Mountain Pine Ridge, an area of highland pine forest. In view of the Guatemala and Honduras records, the occurrence of this species in Belize as a rare resident should not be unexpected.

WESTERN WOOD-PEWEE *Contopus sordidulus*

Scott Wood *et al.* (1986) list this species as accidental, with one previous record (Russell 1964: 122; a specimen collected at Orange walk in December 1881). An individual of this species was banded at Stann Creek on 15 March 1960.

CASSIN'S KINGBIRD *Tyrannus vociferans*

Two banded at Stann Creek on 9 March 1960, one banded at Melinda Forestry Station on 6 March 1961, one banded on 9 March 1962 at Silver City, Stann Creek District. I can find no trace of this last locality. In addition to the above, I banded a single Cassin's Kingbird near Ladyville, Belize District, on 9 April 1985. Scott Wood *et al.* (1986) list this species as an accidental, with one record. The only published record prior to 1986 is one on the Christmas Bird Count for Belize City area, on 26 December 1985 (*American Birds* 40 (1986): 1024).

WESTERN KINGBIRD *Tyrannus verticalis*

One banded 11 miles west of Stann Creek on 16 April 1963. This species has not been previously reported from Belize. Monroe (1968) states that the Western Kingbird is a rare transient in the Caribbean lowlands of Honduras, and that there are sight records from the Swan Islands.

GREY KINGBIRD *Tyrannus dominicensis*

One banded E1 Cayo (San Ignacio) on 22 March 1960, another at Middlesex on 26 March 1963. Monroe (1968) lists it as a rare migrant to the Swan Islands, and probably the northern coast of Honduras. The only previous published records for Belize are by Howell *et al.* (1992).

HUTTON'S VIREO *Vireo huttoni*

Wood *et al.* (1986) list this species as a rare (less than five records) permanent resident of the Mountain Pine Ridge. Russell (1964) mentions only one record, a specimen from the Mountain Pine Ridge taken on 26 April 1888. Nickell banded two individuals of this species, one on 22 March 1963 and another on 19 March 1964. On these dates he was working in the Stann Creek Valley, between the coast at Dangriga and Middlesex. These records extend the geographical distribution of this species into the Southern Hardwood Forest.

Acknowledgement

I wish to thank Danny Bystrak of the Bird Banding Laboratory, United States Department of the Interior, for verifying the computer records against the originals.

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Status of migratory *Cuculus* cuckoos in Zaïre

by Michel Louette & Paul Herroelen

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Basing ourselves on the collections in the Royal Museum for Central Africa, Tervuren (KMMA), the Royal Institute of Natural Sciences, Brussels (KBIN) and the British Museum (Natural History), Tring (BMNH), we have found that some points regarding the status of migratory *Cuculus* cuckoos in Zaïre need clarification.

Cuculus canorus

According to Seel (1984), the Cuckoo evacuates the northern hemisphere virtually completely in December-January. This would imply that the northwestern African-Iberian race *bangsi* crosses the Equator (and reaches Zaïre); this population is small, both in size and in number. Vaurie (1965) gave as range in wing chord measurements for *bangsi* males 203–217 mm against 218–233 mm in nominate *canorus*, and we find on average females in all races smaller than males.

TABLE 1
Number of specimens of *Cuculus canorus* from Rwanda, Burundi and Zaïre in KMMA

Month	1st Winter	Adult
August	0	1
September	6*	4
October	11*	6*
November	7	0***
December	2**	0
January	0	4
February	6	8*
March	12*	22*
April	5	2
May	1	0

* almost exclusively in the eastern part of the region
** in the south of Zaïre
*** 1 in KBIN

The hypothesis of evacuation of the northern hemisphere is not contradicted by the monthly pattern of specimens in KMMA (Schouteden 1950, augmented by several then considered as *C. gularis*; Table 1). Adult birds proceed southwards before first-winter birds, but all Cuckoos apparently pass Zaïre. However, we must investigate the possibility that some Cuckoos, most likely (the whole population of) *bangsi*, remain to winter in western Africa. Field observations may not all be reliable, because of possible confusion with the very similar *C. gularis*. Checklists published after Seel's revision for Ivory Coast (Thiollay 1985), Ghana (Grimes 1987) and Mount Nimba (Colston & Curry-Lindahl 1986; the BMNH holds the six specimens, mostly moulting first-year birds from December-January, with wing chords 193–206 mm) suggest wintering there, which was already accepted by Moreau (1972). Farther to the east, in Nigeria (Elgood 1982), Cameroon (Louette 1981), Gabon (Brosset & Erard 1986) and Central African Republic (Carroll 1988), the Cuckoo is very rare or unrecorded. One bird in BMNH is small and referable to *bangsi*—a first-year female, 29 October 1910, Bitye, Cameroon; wing 185 mm—but there is also a midwinter ringing recovery from Cameroon of a British bird (definitely not *bangsi*). Only one bird in Zaïre, the hepatic KMMA specimen taken at Bobito (Ubangi) on 15 January 1959 (and present there already for some days according to the collector), is remarkable in its presence that far north in midwinter, no other Cuckoo ever having been taken in this region, where Herroelen, Maes and others made quite substantial observations (but there are two autumn birds from Boende and Yalokele, not far to the south), suggesting either very rapid overflying of this general area or another route.

According to Moreau (1972), the autumn passage is over a broad front in Africa but the spring passage is especially remarkable in the east. Verheyen (1951), however, suggested that the birds enter western Europe in spring from the southwest. Seel's (1984) findings are not in conflict with either of these assumptions. Large birds (which cannot be *bangsi*) indeed pass through North Africa and Iberia in late spring (specimens in BMNH: 10 females, wing chord 190–207 mm, mean 200.6 mm; two males, over 220 mm).

Herroelen (1983) suggested that the birds taken in eastern Zaïre were not *bangsi* but possibly *subtelephonus*, a race supposedly present in eastern Africa as well (Meinertzhagen 1937, Britton 1980). The determination of an individual to subspecies is tricky, some rather small birds having been caught as far north as Belgium (Herroelen measured an adult female with wing chord only 193 mm) and the supposed differences given by Vaurie (1965), Mackworth-Praed & Grant (1970) and Cramp (1985) are hardly useful. Pending further evidence therefore, we do not yet admit *bangsi* to the list of Zaïre contrary to what could be inferred from Seel (1984) and Cramp (1985).

Incidentally, Payne (1977a) demonstrated that the immature of this species is browner in general colour—and has brown or rufous in the primaries and wing coverts—than the immature of *C. gularis*, which is greyish, always without brown (in Fry *et al.* 1988, hereafter called *Birds of Africa*, a brownish juvenile is illustrated as *C. gularis*!).

Cuculus poliocephalus/rochii

The Lesser Cuckoo *C. poliocephalus*, a migrant to eastern Africa from Asia, is as yet unknown from Zaïre: if it occurred, it could be distinguished from the Madagascar Cuckoo *C. rochii* by its hepatic females and smaller size (maximum wing chord 162 mm; mean of 10 males from India in BMNH 154.5 mm), and by its presence in Africa later in the year, the first recorded date being 26 November, in Tanzania (Becking 1988).

There are in fact more Madagascar Cuckoos from Zaïre than were known to Becking: the KMMA holds 9 specimens, dated June (2), July (3), August (1), September (2), October (1); 5 from Kivu, 4 from Kasai. In the KBIN, there are two. One is the type of *Cuculus stormsi* Dubois 1887 (with a nice illustration), from "Tanganyka", undated, with wing chord measurements of 165 and 168 mm; this name a junior synonym of *rochii*. The other one, from Shinkulu, Upemba (Verheyen 1953), collected on 26 November 1947, is an adult male with wing chord 162.5 mm, but measured on a worn feather (when fresh, it might well have been 3 mm longer). This is very late in the season. In Madagascar, Rand (1936) had a specimen "ready to lay" in mid-August and Milon (1959) found the species present from September onwards, and "en plein chant" October to December. Milon studied breeding and proved it to occur from November to April. The period of occurrence in Zaïre is therefore extended and overlaps with the early arrivals in Madagascar. The states of moult of the adult *rochii* specimens from Zaïre are as follows: 2 with active moult (July), 5 with interrupted moult in wings and tail (June to August) and 3 with no moult (September to November), a pattern in accordance with their migration.

Some birds from Zaïre are rusty on the neck (*contra* Becking). This may correspond to the female as given for the Lesser Cuckoo in *Birds of Africa*, but Langrand (1990) says "sexes similar" for the Madagascar

Cuckoo, and a bird with brown feathers on the neck is depicted therein as "immature", confirmed by the description. There is one immature in the KMMA collection (119766 from Idjwi Island in Lake Kivu, August): all juvenile feathers are with narrow white fringes as in *C. solitarius* or *poliocephalus*; very few tawny fringes are present on head, neck and mantle.

Cuculus clamosus

The Black Cuckoo is variable in plumage in Zaïre. Both the red-breasted race *gabonensis* and the almost black nominate race are present. Chapin (1939) postulated that the forest phenotype is surrounded by a savanna phenotype with interbreeding along all zones of contacts yielding intermediates ('*jacksoni*', '*mabirae*') which are nothing more than *gabonensis*/*clamosus* hybrids. There are a few birds of the *c. clamosus* phenotype (which can be barred to some extent; it is not necessarily completely black) in the collection from northern Zaïre, dated January (2), April, June, July (2), September (2) and November. Such birds, in breeding condition, are also known from west of Zaïre: there are two from Nigeria (November) and one female from Powo, Cameroon, September (BMNH material). Therefore, the supposed migration of southern *c. clamosus* towards Nigeria and further west (Curry-Lindahl 1981), if it exists at all, does not seem to involve birds in northern Zaïre. What happens in the west? The BMNH has blackish birds from West Africa from the months January (1), March (1), April (1), May (3), June (2), July (2), September (1). Completely black birds, on the other hand, have been found in southern Zaïre only in the months October (1), February (4), March (1, plus 3 fledglings), April (2), May (1 fledgling). This group may contain some migrants from further south. The species breeds in South Africa from September to April; but very young birds from Zaïre were collected in the months March (5), May (3), July (2), August (2), October (1), exactly the opposite season. A juvenile from Kwango (October) could belong to either race.

Among the 75 males, 23 females and 15 unsexed in KMMA, there are only the following in active moult: northern area of Zaïre (number: moult scores, following Ashmole 1962): September (2:7 and 49), October (1:46, adjacent Cameroon), November (1:7), January (2:4 and 44); southern area: February (1:8), March (1:8), April (2:4 and 11). Moult timing is thus different for the birds collected in these two areas, suggesting that different populations are involved.

C. c. gabonensis is very close in plumage to the Red-chested Cuckoo *C. solitarius*, but in view of the very different juvenile plumage it seems unlikely that the two species are close relatives, as claimed in *Birds of Africa*. The statement that *C. clamosus* has a "rather slender build" is misleading; *clamosus* is in fact a heavier bird than *solitarius* for about the same wing length (weights given in *Birds of Africa* itself; Herroelen weighed live *clamosus*: 75, 93 and 94 g; Verheyen (1953) gives 66 and 74–81 g for 8 male *solitarius*. As a specimen, the Black Cuckoo looks more thick-set. The juvenile plumage of *solitarius* is very different, and close to that of the other African breeding *Cuculus* (*gularis*) and some of the oriental species. Probably the divergent juvenile plumage of *clamosus* has a mimetic function (cf. Payne 1977b).

The "immature" Black Cuckoo *C. c. gabonensis* illustrated in *Birds of Africa*, with whitish tips to the rectrices, reddish breast and barred belly, is in fact an adult bird. The young of this species is jet-black in all races, the tail being uniformly black (as mentioned correctly by Chapin (1939), Friedmann (1948) and Snow (1978), and illustrated for *C. c. clamosus*. Its first moult yields the adult pattern, including the coloured and barred parts on the ventral side and the white-tipped rectrices. A typical adult of *gabonensis* is much more reddish on the breast than the other specimen illustrated in *Birds of Africa*. In *gabonensis* the examples with unbarred red breast are usually considered to be the males, whereas those with blackish and pale barring in the reddish breast are considered to be the females; but BMNH specimens sexed by Serle from Nigeria show that males can have a banded breast.

It seems that in the adult female *solitarius* the reddish brown on the breast is paler than in the male, in fact the opposite tendency to that in *poliocephalus, rochii*, and indeed *canorus*, in which the female is more brownish than the male.

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Notes on birds observed in beech (*Fagus*) forests in the Maoershan Natural Reserve, Guangxi Autonomous Region, China

by François Vuilleumier

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As part of long term research on the evolution of bird faunas in forests of southern beeches (*Nothofagus*) (Vuilleumier 1985, Vuilleumier & Kikkawa 1991), I also visited wet temperate forests in the northern hemisphere, including northern beeches (*Fagus*), for comparative purposes. Thus, between 9 and 11 June 1992 I studied the avifauna living in and around beech (*Fagus*) forests in the Maoershan Natural Reserve Area, Xing'an and Ziyuan Counties, Guangxi Autonomous Region, People's Republic of China. Even though my visit was brief, and unfavourable circumstances (including prolonged travel on very bad roads, and acute respiratory illness) prevented me from spending as much time in the forests as I had originally planned, my notes might be of interest because the avifauna of this forested area of southern China is poorly known and may not have been visited by western ornithologists in the recent past, if at all. The only published reports on the Maoershan Natural Reserve that I am aware of are those of Li (1985, 1986) (which I saw) and Zhang (1979) (which I did not see). I did not find reports dealing with the avifauna of Maoershan or its forests.

Large and relatively undisturbed stands of beeches (*Fagus longipetiolata*), mixed with other tree species, grow along the slopes of the Maoershan Mountain Range in northern Guangxi Autonomous Region, southern China, forming a distinct belt at altitudes from about 1300 to 1700 m. Higher up, other tree species, especially *Symplocos* sp. (Styracaceae), are dominant. The botany of this large forested watershed has been studied by Professor Li Guang-Zhao of the Guangxi Institute of Botany (for general summaries see Li 1985, 1986), who has made beautiful and very complete plant collections in the area, now housed in the herbarium of the Laboratory for Plant Taxonomy of the Guangxi Institute of Botany in Guilin, which I was kindly allowed to study on 8 June 1992. Unfortunately, Professor Li's list of plant taxa for Maoershan Natural Reserve is still unpublished.

In contrast with Maoershan, the Yaoshan (or Dayaoshan, see 1991/92 Hallwag map "China Far East" at 1:6,000,000), an isolated mountain range with its summit at 1979 m, found at 24°00′N, 110°03′E in central Guangxi, about 240 km south of Maoershan, has been well explored ornithologically (see Stresemann 1929a,b, 1930a–c, Yen 1933–34). Unfortunately these reports give no botanical information about the vegetation types in which the montane birds were collected. Mell (1925a,b) described the botany and ornithology of montane forests of three relatively low mountains in Guangdong (Kwangtung) Province, west of Guangxi. The maximum altitude of these three ranges is about 1100 m (Mell 1925b: 163), just below the altitude at which *Fagus* appears at Maoershan. Mell (1925b) mentioned a number of trees that are also present in the montane forests of Maoershan (including the Fagaceae *Castanopsis* and *Lithocarpus*), but not *Fagus*, which is therefore probably absent from his study areas. Thus, unfortunately, Mell's (1925b) important paper cannot be used for direct comparisons with the montane avifauna in the *Fagus* belt at Maoershan.

Description of study area

According to Professor Ma Yiqing (*in litt.*), Maoershan Natural Reserve is one of four major regions where extensive forests of beech (*Fagus* spp.) can still be found today in China. The other three areas are: (1) Fanjinshan Natural Reserve at 27°54′N, 108°36′E in Yinjing County, Guizhou Province, (2) Badagongshan Natural Reserve at 29°18′N, 110°06′E, in Sangzhi County, Hunan Province, and (3) Baba Forest Area at 36°36′N, 106°54′E in Nanjiang County, Sichuan Province. Much of the information below on the Maoershan area is taken from the useful papers by Li (1985, 1986).

The Maoershan Natural Reserve forms a substantial part of the Maoershan Mountain Range which contains 10 peaks above 2000 m elevation and whose summit, at 2142 m, is the highest in Guangxi Autonomous Region. The Natural Reserve is located at 25°48′–25°58′N, 110°20′–110°35′E in Xing'an and Ziyuan Counties, Guangxi Autonomous Region, about 130 km by road NW of Guilin City. The area immediately below the summit is covered by a complex of buildings used by the workers of the television station. During my stay, with good weather, the view westward from the summit extended across broad, shallow, and unforested cultivated valleys to an impressive series of mountain ranges at the border between northern Guangxi and southern Hunan Province, several of which probably reach above 2000 m, and most of which were totally deforested.

According to Li (1986) an access road was constructed and a television relay station was built just under the summit of Maoershan in 1976. Shortly afterward the Guilin District authorities officially declared about 7160 ha of the Maoershan Mountain Range a Natural Reserve. In 1978 the area of the Reserve was enlarged to 15,300 ha. Heavy logging had taken place before 1948 in the lower parts of what is now the Reserve.

The mission of the Reserve is several-fold. First it aims to protect the huge Maoershan watershed, which is very important to the Guilin area, by preserving the forest cover of the slopes and mountain-tops. Secondly the goal is to protect the forest ecosystem, and especially several components of its animal and plant life, thus preserving a large pool of genetic diversity. For example, the Reserve contains several plant species which are rare and endangered in China. A third goal is to promote scientific research on the fauna and flora. A final goal is to educate the people and to encourage them to appreciate the importance of the forest resources of Maoershan.

Botanically, Maoershan is one of the richest and most diversified areas in Guangxi with 1436 species of vascular plants, including 670 species of woody plants. This diversity is due to the fact that the flora is rich in both subtropical and temperate zone elements and also contains some tropical elements (Li 1986). The structure of the tree community at Maoershan is complex. Between 4 and 6 and occasionally up to 8 species of trees can be found in plots as small as 100 m^2 (Li 1986).

Geologically, Maoershan is composed mostly of pre-Devonian granite but also includes sandstones and schists. The Maoershan range was uplifted during the Yanshen Orogeny, between the Jurassic and the Cretaceous (Li 1986).

About 2100 mm of rain fall at Maoershan each year, especially during the rainy season between February and June (Li 1986). During the three days of my visit in early June, however, the weather was dry and sunny, with clear and cool mornings, hot and hazy days, and clear and cool nights. Occasional fogs rolled up from the valleys east of Maoershan toward the crests in the late afternoon of 9 and 10 June. According to Li (1986) the relative humidity of the Maoershan area averages 80%, 9 months out of 12 having heavy cloud cover above 1000 m elevation. The whole region is well watered and has about 45 streams, several waterfalls, and a number of springs (Li 1986).

The average annual temperature at the summit (2142 m) is 7°C (maximum 23°C, minimum − 19°C). At 1200 m the average January temperature is 2.9°C, and the average July temperature is 21.5°C (maximum 28.9°C, minimum − 15°C). Even though Maoershan is subtropical (Li 1986), frosts occur on average 105 days per year at the summit.

The wide range of climatic conditions, especially temperature, encountered from the bottom areas to the summit of Maoershan has resulted in clear-cut altitudinal zonation of vegetation (Li 1986). The native vegetation (presumably forest) is completely gone from the lower areas where intensive cultivation, mostly rice, is practised on terraces along the valley slopes and in all valley bottoms (at about 600–700 m), where a dense human population lives in numerous small villages, and where traditional southern Chinese life still prevails. Water buffaloes are commonly used in the fields.

Above this lower zone, the mountain slopes are largely or completely deforested up to about 1200 m and covered either with dense, homogeneous, and extensive secondary growth stands of tall bamboos (*Phyllostachys*), or with mixed vegetation including shrubs (e.g. *Rhus* sp.) and small trees (e.g. *Cunninghamia* sp.) as well as bamboos.

Isolated *Fagus longipetiolata* trees start appearing above a narrow belt of deforested grassy slopes, at about 1100 m. Beeches are abundant and conspicuous higher up and form the main component of a distinct altitudinal zone from about 1300 to about 1700 m. Li (1986) calls this zone "deciduous-evergreen broadleaf mixed forest". Beech trees grow on very steep slopes, with an angle I estimated as 20°–50° (30°–40° according to Li 1986). Other trees of the family Fagaceae occurring with *Fagus* to form the canopy include the oaks *Castanopsis* and *Lithocarpus*. The understory, composed of shrubs (especially *Rhododendron* spp.) and bamboo (especially *Indosasa* sp.), is dense, in places even impenetrable. Working along such steep slopes in such dense vegetation was quite difficult, and several times I was obliged to restrict my observations to roadside areas. Within the *Fagus* belt individual beech (and other) trees are usually large and stately, many reaching a height of about 20–30 m. I noticed that many tree trunks and branches were covered with a thick growth of mosses, lichens and other epiphytic vegetation, thus revealing the high moisture content of the atmosphere.

Above 1700 m, *Fagus* disappears, and the *Fagus* belt is replaced by a mixed forest that includes 80% broadleaf trees as well as some evergreen conifers (especially conspicuous are hemlocks, *Tsuga* sp.). One of the dominant taxa in this vegetation belt, which goes from 1700 to 2000 m, is *Symplocos* sp. Li (1986) calls this forest "evergreen broadleaf and evergreen broadleaf/needle leaf forest". At these higher altitudes, the landscape is different, the slopes less steep, but the forest is dense with a closed canopy and grows on relatively shallow, often waterlogged and boggy soils. This montane area is characterized by high winds and high humidity and many trees show a trend toward dwarfism. Many trees, including gnarled *Tsuga*, are up to 250–300 years old (Li 1986).

The highest vegetation zone, found from mountain ridges at 2000 m to the summit, is a dense brush and stunted forest. It includes many of the same species found at the lower elevational belt, but they show a characteristic dwarf growth form (Li 1985, 1986).

Itinerary

9 June 1992. In spite of diligent attempts to leave Guilin early, I was not able to do so until 12.00 because of delays in the necessary paperwork prior to field work. The very bad conditions of roads in and immediately around Guilin and in the approaches to Maoershan made the approximately 130 km drive an interminable $6\frac{1}{2}$ hours. Thus only brief stops could be made in the flat lowlands north of Guilin, in heavily cultivated valleys at about 600–800 m, along deforested mountain slopes at 1000 m, in the *Fagus* belt at 1500 m, and below the TV station at 2200 m.

10 June 1992. I worked from 06.30 to 12.30 at about 1400–1600 m in *Fagus* forests, then from 13.00 to 15.30 and from 17.00 to 19.30 at 1750–1950 m above the *Fagus* belt, in ridgetop forest dominated by *Symplocos* sp.

11 June 1992. I worked from 06.30 to 07.30 at 1900 m in *Symplocos* forest above the *Fagus* belt, then from 08.00 to 10.00 at about 1300 m in *Fagus* forests. Occasional stops were made lower down (about 800–1000 m) and in cultivated valleys (about 600 m) in the late morning. I returned to Guilin by late afternoon, again on terrible roads.

Because of the fact that the TV station hostel at about 2200 m had a locked gate at night, it was not possible to go out and work in *Fagus* or *Symplocos* forests at night. Hence my observations do not include any nocturnal species.

Annotated list species

Sequence and nomenclature follow, for convenience, Meyer de Schauensee (1984). Birds marked with * were seen in the *Fagus* belt.

*EURASIAN HONEY BUZZARD *Pernis ptilorhyncus* (?)

Two birds flying over steep, deforested slopes at about 1200 m on 9 June at the lower edge of the *Fagus* belt, in mixed vegetation consisting also of bamboos (*Phyllostachys pubescens*), scrub (*Rhus chinensis*), and low trees (*Cunninghamia lanceolata*). Recorded from Yunnan and Sichuan (Meyer de Schauensee 1984) but not Guangxi. However, Yen (1933: 234) cited a November specimen from Guangxi, and Cheng (1987) mentioned the species as a migrant from Guangxi. The two birds were very similar in plumage, with dark blackish-brown underparts, dark wing coverts, pale primaries and secondaries, tail long and rather uniformly barred, with central tail feathers missing. I presume these two birds were in juvenal plumage, and had recently fledged. Their calls were high-pitched whistles.

CRESTED SERPENT EAGLE *Spilornis cheela* (?)

One dark brown bird, probably immature, flying low over *Symplocos*-dominated forested ridge at about 1800 m on 9 June. Yen (1933: 234) reported this species as resident at Yaoshan.

***ROCK PIGEON** *Columba livia*

Uncommon in villages at 600–700 m in bottoms of densely cultivated mountain valleys. Not cited by Yen (1933: 228–229) in his list of Columbidae from Yaoshan and Guangxi.

***LARGE HAWK CUCKOO** *Cuculus sparverioides*

Heard in *Fagus* forest at about 1500 m, 10 June 1992, between 07.00 and 09.00. Not common. Yen (1933: 616) stated that in Guangxi this species was only found in Yaoshan.

***ORIENTAL CUCKOO** *Cuculus saturatus*

Commonly heard in *Fagus* forest between about 1400 and 1600 m, 10 June 1992. Yen (1933: 615) found the species in April and May at Yaoshan.

***LESSER CUCKOO** *Cuculus poliocephalus*

Commonly heard in *Fagus* forest at about 1450–1500 m, 10 June 1992, between 07.00 and 10.00.

***PLAINTIVE CUCKOO** *Cacomantis merulinus* (?)

Probably heard in *Fagus* forest at about 1300 m, 11 June 1992, at about 08.00. Yen (1933: 617) stated that this species never visited the Yaoshan.

***GREY-HEADED WOODPECKER** *Picus canus*

One of two birds in relatively dense *Fagus* forest on steep slopes at about 1500 m, 10 June 1992. The birds were foraging on tree-trunks about half way up 25 m tall beech trees. Yen (1933: 621) stated that this sedentary species was very common at Yaoshan. According to Cheng (1987), it lives in "open evergreen forest mixed with bamboo in the south."

***GREY-CAPPED WOODPECKER** *Picoides canicapillus*

Several birds foraging in the middle stratum of *Fagus*-dominated forest between about 1400 and 1600 m, 10 June 1992.

BARN SWALLOW *Hirundo rustica*

Common in mountain valleys and along deforested valley slopes from about 600 to about 1300 m, 9, 10 and 11 June 1992.

RED-RUMPED SWALLOW *Hirundo daurica*

Common in villages at about 600–800 m in mountain valleys, 9 and 11 June 1992.

ASIAN HOUSE MARTIN *Delichon dasypus*

A colony of about 20 pairs had active nests under the eaves of one of the buildings of the TV station below the summit of Maoershan at about 2300 m on 10 and 11 June 1992. It was not seen lower down. Yen (1933:

756–757) stated that this species was sedentary at Yaoshan, found only above 1500 m in rocky areas.

*GREY WAGTAIL *Motacilla cinerea*

One bird along the road in the *Fagus* belt area at about 1700 m, 10 June 1992. Cheng (1987) does not cite this species as breeding in Guangxi. Called "winter visitor" by Stresemann (1930a) at Yaoshan. Yen (1934: 495) listed specimens from 21 April 1931 and 8 May 1929 from Yaoshan, commenting that "some individuals have been observed and obtained in the summer, which proves that, among the numerous migrants, some remain to breed".

WHITE WAGTAIL *Motacilla alba*

Commonly found along rocky streams from about 600 to about 1000 m in cultivated mountain valleys, 9 and 11 June 1992.

UPLAND PIPIT *Anthus sylvanus* (?)

One bird on a steep, grass-covered slope along the roadside at about 1000 m, 11 June 1992. Cheng (1987) cited this species from Yaoshan. Yen (1934: 497) noted that it was "sedentary, but rather rare at Yaoshan", and that "It was found only above 1000 meters altitude, in large forests".

BLACK-WINGED CUCKOO-SHRIKE *Coracina melaschista* (?)

Several birds at 1800–2000 m in tree-tops of ridgetop forest dominated by *Symplocos* on 9 and 10 June. Yen (1934: 304) noted that this species was "very common in the plains of Guanxi and at Yaoshan during the warm season".

*SWINHOE'S MINIVET *Pericrocotus cantonensis*

One bird in *Fagus* forest at about 1500 m on 10 June. Although collected 14 April at Yaoshan, Stresemann (1930c) believed this species to be a winter visitor there. But Yen (1934: 306) stated that it was "common in March, April, May, and early June".

*GREY-CHINNED MINIVET *Pericrocotus solarius*

One male at about 1300 m in *Fagus* forest on 11 June, perched high up on beech trees in relatively open forest. Cheng (1987) mentioned this species from Yaoshan. Stresemann (1929a) and Yen (1934: 305) both cited it from Yaoshan, where it was very common according to Yen.

*SCARLET MINIVET *Pericrocotus flammeus*

Several birds (males and females) in *Fagus* forest at about 1400–1500 m on 10 June, usually perched high up on tall beech trees. This species is cited from Yaoshan by Cheng (1987). Yen (1934: 305) found it sedentary, and "rather common at Yaoshan from the base of the mountain to an altitude of about 1500 meters".

COLLARED FINCH-BILLED BULBUL *Spizixos semitorques*

One or two birds singing from the top of 3–4 m tall shrubs in riverine vegetation at 600 m in a cultivated mountain valley, 11 June. "Rather rare at Yaoshan" according to Yen (1934: 303).

LIGHT-VENTED BULBUL *Pycnonotus sinensis*

Several seen in riverine bushes along a valley floor at about 600 m, 11 June. Mentioned from Yaoshan by Cheng (1987).

***BLACK BULBUL** *Hypsipetes madagascariensis*

One white-headed bird flying in the canopy of *Fagus* forest at about 1300 m, 11 June. According to Yen (1934: 298) this species is sedentary at Yaoshan, where it is found higher up in summer than in winter.

ORANGE-BELLIED LEAFBIRD *Chloropsis hardwickii*

One bird foraging under the canopy of *Symplocos*-dominated vegetation at about 2000 m, 10 June 1992. Listed from "Yaoshan Mt. and southwestern part" of Guangxi by Cheng (1987). "Sedentary and common at Yaoshan" at about 1000 m, according to Yen (1934: 297).

PLUMBEOUS REDSTART *Rhyacornis fuliginosus*

One pair in riverbed area, 600 m, mountain valley, 11 June.

GREY BUSHCHAT *Saxicola ferrea*

One or two singing males, 9 June 1992, open area with buildings, some abandoned, and miscellaneous scrubby growth, about 1100 m. A tall TV relay antenna was a favourite song perch. "Sedentary and common at Yaoshan" (Yen 1933: 767).

CHESTNUT-BELLIED ROCK THRUSH *Monticola rufiventris*

One immature male in the treetops of *Symplocos*-dominated vegetation at about 2000 m, 10 June 1992. Dark blue wings and tail (which was moved up and then down) were very conspicuous. Cheng (1987) cited the species from Yaoshan. Yen (1933: 772–773) stated that it is sedentary at Yaoshan, found mostly above 1500 m. "Contrarily to most of its congeners, which live among rocks rather than in trees [this species]. . .is quite arboreal and goes to the ground only to search for insects" (Yen 1934: 773).

GREY-WINGED BLACKBIRD *Turdus boulboul*

Common in *Symplocos*-dominated forest at 1800–2000 m below the TV station, 9–11 June, especially active and singing in the early morning and late afternoon. The song, rich and melodious, is quite reminiscent of that of the common Blackbird *T. merula*. Ali (1977) called the song "rich, fluty, far-carrying: of remarkable variety and mellowness and perhaps one of our finest bird songs." Cheng (1987) cited this species as "rare" from Yaoshan (subspecies *yaoschanensis*). Yen (1933: 773), who had earlier described *T. boulboul yaoschanensis*, stated that it has never been found below 700 m, and lives in woods, where it searches for its food on the leaf litter.

***STREAK-BREASTED SCIMITAR BABBLER** *Pomatorhinus ruficollis*

At least 2 birds foraging low down in *Fagus* forest undergrowth at about 1300 m, 11 June. Calls are loud and sharp *ticks*. The bill appeared all black, whereas it is usually depicted pale (e.g. Etchécopar & Hüe

1983, pl. 256). Mell (1925a) stated that this species was a characteristic bird of dense undergrowth of tropical rainforest in Guangdong (Kwangtung). At Yaoshan, listed from 1000 to 3000 feet by Stresemann (1929a), and from the bottom to a very high altitude by Yen (1934: 30).

***PYGMY WREN BABBLER** *Pnoepyga pusilla*

One bird at about 1500 m in the undergrowth of *Fagus* forest on 10 June. Constantly flicks wings open and shut, and emits sharp *tsik* calls. Cited from Yaoshan by Cheng (1987), where it is sedentary (Yen 1933: 788).

HWAMEI *Garrulax canorus*

Seen only once, in second-growth grassy and scrubby roadside habitat below the *Fagus* belt at about 1000 m, 11 June.

RED-TAILED LAUGHING-THRUSH *Garrulax milnei*

Seen on two occasions in *Symplocos*-dominated ridgetop forest at 1800–2000 m on 10 June: first an isolated bird and then two individuals together. They moved from tree to tree in the subcanopy, hopping on trunks and branches, and foraging among leaves. Yen (1934: 25) stated that it fed on the ground. Red wings and tail are extremely conspicuous against the dark green foliage. Cited from Yaoshan and Longsheng by Cheng (1987). Longsheng is located southwest of the Maoershan Summit at 25°48′N, 109°57′E on the 1:6,000,000 map "China Far East" published by Hallwag 1991/1992 edition. Stresemann (1930b) described the population from Yaoshan as a separate subspecies, *sinianum*, which Cheng (1987) also cites from Guizhou. At Yaoshan this species is never found below 1000 m (Yen 1934: 25).

***RED-BILLED LEIOTHRIX** *Leiothrix lutea*

Quite common from about 1400 m to nearly 2000 m, in *Fagus*-dominated forest on steep slopes and in *Symplocos*-dominated ridgetop forest. In both types of vegetation it was found mostly in the undergrowth (shrubs, bamboos) and was often observed in mixed flocks (see Yen 1934: 41). Many singers were heard. The song, rich and varied, is a characteristic sound of the Maoershan forests. From 1000–4000 feet at Yaoshan (Stresemann 1929a).

***BLUE-WINGED SIVA** *Minla cyanuroptera*

Common from about 1500 m to nearly 2000 m, usually isolated birds, or 2–3 birds together, often in mixed flocks, in the undergrowth of both *Fagus*- and *Symplocos*-dominated forests. This species seems especially fond of bamboos, where it actively gleans for prey among bamboo leaves. From "Yaoshan Mt., and southwestern part" of Guangxi, according to Cheng (1987). Not listed from Yaoshan by Stresemann or Yen, but Hachisuka (1941) described *M. cyanuroptera yaoshanica*, on the basis of an unsexed adult "most probably [from] Yaoshan". According to Hachisuka this was the first record from southern China.

***RED-TAILED SIVA** *Minla ignotincta*

Slightly less common than *M. cyanuroptera*, and often found in the same mixed flocks, from about 1500 to 2000 m in both *Fagus*- and

Symplocos-dominated forests. Unlike *M. cyanuroptera*, however, *M. ignotincta* foraged by climbing (hopping?) on moss-covered trunks and branches rather than in bamboos and by searching the dense epiphytic vegetation. These observations do not match those of Ali (1977), who wrote that *M. ignotincta* feeds "tit-like in high canopy foliage", and that the habits of *M. cyanuroptera* were like those of *M. ignotincta*. Similarly, my observations do not agree with Etchécopar & Hüe (1983), who wrote that *M. ignotincta* shows a "marked preference for trees and especially high branches near the treetops". Yen (1934: 42) found *M. ignotincta* common at Yaoshan between 1000 and 2000 m, where it "flies from foliage to foliage, from branch to branch, searching for its food, composed especially of insects". In Guangxi, it has been reported in the "eastern part—Yaoshan Mt., northeastern part—Longsheng" (Cheng 1987). Stresemann (1929a) described the Yaoshan population as a new subspecies, *sini*.

***GOLDEN-BREASTED FULVETTA** *Alcippe chrysotis*

Seen on two occasions on 10 June: (1) two or three birds in a mixed flock with *Minla cyanuroptera, M. ignotincta, Alcippe cinereiceps, Culicicapa ceylonensis* and *Leiothrix lutea* at about 1600 m at the upper edge of *Fagus* forest; and (2) one bird with *Phylloscopus reguloides* at 1900 m in *Symplocos*-dominated forest. Actively forages, tit-like, in bamboo undergrowth. Cheng (1987) cites this species from the "northwestern part" of Guangxi. Not listed by Stresemann or Yen from Yaoshan.

***STREAK-THROATED FULVETTA** *Alcippe cinereiceps*

Common from about 1400 m to the summit at 2142 m, in *Fagus*-dominated forest, *Symplocos*-dominated forest, and in the dense, stunted vegetation growing on the summit of the Maoershan ridge, composed of thickets of bamboos, *Ilex* sp. and *Rhododendron* sp. on 9, 10 and 11 June. Several times in mixed flocks. Several birds that I observed at close range had white irides. This species was not cited from Guangxi by Cheng (1987). The birds I saw looked somewhat intermediate between specimens of *guttaticollis* from Fukien and 4 specimens of *tonkinensis* from Tonkin collected on 17 and 19 November and 14 December 1929 and kept in the American Museum of Natural History collection. Could Tonkin birds be migrants from southern China? King *et al*. (1975) stated that *Alcippe cinereiceps* is "resident above 6000 ft." in southeast Asia. Ali (1977) mentioned only vertical movements in the eastern Himalayas.

***BLACK-CHINNED YUHINA** *Yuhina nigrimenta* (?)

Two to three birds at about 1450 m in bamboo undergrowth of *Fagus*-dominated forest, 10 June. "Sedentary and common" at Yaoshan (Yen 1934: 39).

***VINOUS-THROATED PARROTBILL** *Paradoxornis webbianus*

Several at about 1100 m in dense roadside scrub, 9 June. Two at about 1550 m in a clearing with brush and reeds in *Fagus*-dominated forest, 10 June. Several in riverine bushes at 600 m in a mountain valley, 11 June. In all three areas, these birds were actively foraging in the lower part of the vegetation, usually calling loudly but remaining out of sight. At Yaoshan, sedentary and from the foothills to about 1500 m (Yen 1934: 489).

***BROWN-FLANKED BUSH WARBLER** *Cettia fortipes*

Common in dense bamboo-rhododendron undergrowth of *Fagus*-dominated forest from about 1400 to 1600 m, 10 June, and up to *Symplocos*-dominated forest on ridgetops at 1800–1900 m, 10–11 June. The loud song, reminiscent of that of some Australian *Pachycephala*, consists of one long, drawn-out, high-pitched whistle, followed by an explosive and sonorous double syllable: *theeeeeeee—thithiu*! The descriptions in Fleming *et al*. (1976), Ali (1977) and Inskipp & Inskipp (1985) are quite good. "Common at Yaoshan" (Yen 1933: 784).

YELLOWISH-BELLIED BUSH WARBLER *Cettia acanthizoides*

Heard commonly in the late evenings of 9 and 10 June and the early morning of 11 June in *Symplocos*-dominated ridge-crest forest at 1800–2000 m, and in dense summit scrub at 2300–2400 m. This species is not listed from Yaoshan by Stresemann or Yen, and is not reported from Guangxi by Meyer de Schauensee (1984) or Cheng (1987). The song is well described by Fleming *et al*. (1976), Desfayes in King *et al*. (1975), Ali (1977) and Inskipp & Inskipp (1985). It consists of a series of 4–6 slow, deliberate, very high-pitched whistles, followed by a series of 5–7 rich, lower-pitched, and almost trill-like fluted whistles. The whole song is quite loud, carries far, and may last up to about 30 seconds or longer.

***BLUNT-WINGED WARBLER** *Acrocephalus concinens*

One singer at 1550 m in a clearing of *Fagus*-dominated forest with dense reeds and shrubs, 10 June. Mentioned as breeding in Guangxi by Cheng (1987). Yen (1933: 779) listed 1 adult male collected 24 June at Yaoshan, stating that "according to the collecting date of my specimen, this bird also breeds in Guangxi".

***LEMON-RUMPED WARBLER** *Phylloscopus proregulus* (?)

One bird seen at about 1500 m in *Fagus*-dominated forest, 11 June. This species does not breed in Guangxi (Cheng 1987). Stresemann (1930a) mentioned a specimen from December. Yen (1933: 782) stated that it was rather common in winter at Yaoshan.

BLYTH'S LEAF WARBLER *Phylloscopus reguloides*

Common between 1900 and 2200 m in *Symplocos*-dominated ridgetop forest, where it forages in dense undergrowth. Seen in mixed flocks. "Found in all seasons at Yaoshan in flocks in forests. It lives in the summer at rather high altitudes and goes lower down in winter, to the foot of the mountain" (Yen 1933: 783).

***SULPHUR-BREASTED WARBLER** *Phylloscopus ricketti*

One bird at about 1700 m at the upper limit of the *Fagus* belt, 10 June. Not a member of a mixed flock. "Found at Yaoshan from April to June" (Yen 1933: 784).

***GOLDEN-SPECTACLED WARBLER** *Seicercus burkii*

At least one on 10 June at about 1450 m in the undergrowth of *Fagus*-dominated forest. Cited from Yaoshan by Chen (1987). Found at Yaoshan from 1000 to 2000 m (Yen 1933: 785).

***CHESTNUT-CROWNED WARBLER** *Seicercus castaneiceps*

One seen at about 1450 m in the understory of *Fagus*-dominated forest, and one at about 1750 m just above the *Fagus* belt, 10 June. Nervous, flicks wings; alarm calls are sharp trills. Forages by gleaning in the foliage. Found at rather high altitudes at Yaoshan (Yen 1933: 785).

***SMALL NILTAVA** *Niltava macgrigoriae*

Only observed once, a male singing from a perch about 1.5 m above the ground in dark and dense shrubby undergrowth of *Fagus*-dominated forest at about 1400 m, 10 June. The song is a series of thin and variably high pitched squeaky whistles (see Ali 1977), emitted with the bill wide open. Call notes are a series of harsh grating sounds that can be rendered by *krr-krrr-krrr*. Cited from Yaoshan as resident by Cheng (1987). Yen (1933: 765) had written that in Guangxi this species was found only at Yaoshan, where it is sedentary and common.

VERDITER FLYCATCHER *Muscicapa thalassina*

One observation, of a singing male, at about 1950 m in *Symplocos*-dominated ridgetop forest on 10 June. The bird sang from exposed dead branches in the treetops, frequently returning to the same perch. The song consists of a series of high-pitched sounds emitted with the bill wide open, not unlike the song of *Niltava macgrigoriae*, but more varied. Ali (1977) compared the song of *M. thalassina* to that of *Zosterops*. Probably sedentary at Yaoshan (Yen 1933: 763).

***GREY-HEADED FLYCATCHER** *Culicicapa ceylonensis*

One bird on 10 June in a mixed flock at about 1600 m near the upper level of the *Fagus*-dominated belt foraging in the middle stratum of the forest and in undergrowth. Other species in the flock included *Alcippe chrysotis, Minla cyanuroptera, Minla ignotincta, Alcippe cinereiceps* and *Leiothrix lutea*. Cited from Yaoshan by Cheng (1987). Stresemann (1930c) wondered whether this species was a winter visitor to Yaoshan, but Yen (1933: 765) listed specimens from May and June.

***GREEN-BACKED TIT** *Parus monticolus*

Two birds at about 1500 m in *Fagus*-dominated forest, 10 June. Foraged at medium to high levels in trees and shrubs, calling regularly. The voice sounded similar to that of *Parus major*. Not cited from Guangxi by Cheng (1987); not cited from Yaoshan by Stresemann or Yen.

***YELLOW-CHEEKED TIT** *Parus spilonotus*

Seen at about 1900 m in ridgetop vegetation dominated by *Symplocos*, 10 June, and in *Fagus*-dominated forest at 1300 m on 11 June. At the latter place a pair of birds were building a nest, bringing material to a cavity near the top of a tall, isolated roadside *Fagus* snag. Calls a

Parus-like *tchēē*. Cited from Yaoshan by Cheng (1987). "Resides in forests of Yaoshan from 500 to 2000 meters altitude" (Yen 1934: 315). Sedentary but shows altitudinal movements.

YELLOW-BROWED TIT *Sylviparus modestus*

Two birds in the understory of ridgetop vegetation dominated by *Symplocos* at about 1900 m, 10 June. This species was not reported from Guangxi Province by Etchécopar & Hüe (1983), Meyer de Schauensee (1984) or Cheng (1987). Not cited from Yaoshan by Stresemann or Yen. My observations thus appears to fill a distributional gap between Yunnan and Guangdong.

MRS GOULD'S SUNBIRD *Aethopyga gouldiae* (?)

One bird in *Symplocos*-dominated ridgetop forest at about 1850 m, 11 June. Collected 23 May 1929 at Yaoshan (Stresemann 1930c) and supposed to breed. Common there above 1000 m according to Yen (1934: 492) and sedentary.

JAPANESE WHITE-EYE *Zosterops japonica*

Seen in mountain valleys with intensive cultivation at 600–800 m on 9 and 11 June. One nest was being built on 11 June in the crown of a 10 m tall, isolated tree along a torrent in a village at 600 m.

WHITE-RUMPED MUNIA *Lonchura striata*

Several in brushy riverine vegetation at 600 m on 11 June.

EURASIAN TREE SPARROW *Passer montanus*

Seen only in villages in mountain valleys at 600–800 m, 9 and 11 June. Found only below 500 m at Yaoshan according to Yen (1934: 501).

RED-BILLED MAGPIE *Urocissa erythrorhyncha*

Uncommon in dense shrubbery along rivers in the bottoms of mountain valleys at 600–800 m, 9 and 11 June. Interestingly Yen (1934: 505) wrote that this species was rare in lowlands but very abundant on wooded hills and high mountains at Yaoshan.

EURASIAN MAGPIE *Pica pica*

Two birds at 600 m in dense riverine vegetation, 11 June, were the only ones seen in the Maoershan area. Yen (1934: 505) wrote that the Magpie was "sedentary and very common in all regions of Guangxi" and that "At Yaoshan we found it at the foot of the mountain, but very rarely above 1000 m altitude."

Beech forest species

Unfortunately a total of only about 9 hours could be spent in beech (*Fagus*) forests (1 hour in late afternoon on 9 June; 6 hours in the morning on 10 June; and 2 hours in the morning on 11 June). Clearly much more time would be necessary to obtain a representative list of the species of birds occurring in such diverse forests. Nevertheless, in view of the apparent lack of any published list of birds in any *Fagus* forest in China, a few comments may be useful here.

Of the 58 species identified (some with "?") in the Maoershan area, only 33 (57%) were seen in the *Fagus* belt (marked with an * in the annotated list). I did not see (or hear) birds from several families that I expected in this area, including Phasianidae, Columbidae, Apodidae, Capitonidae, Trogonidae, Pittidae, Oriolidae, Dicruridae, Sturnidae and Emberizidae.

Generally speaking, I found bird density to be low in *Fagus* forests from 1300 to 1600 m. The birds seen or heard most commonly belong to the Cuculidae (especially *Cuculus poliocephalus*), Timaliidae (especially *Leiothrix lutea, Minla cyanuroptera, M. ignotincta, Alcippe chrysotis* and *A. cinereiceps*), Sylviidae (*Cettia fortipes*), and Paridae (*Parus monticolus, P. spilonotus*). The four commonest species, in decreasing order of relative abundance, were (1) *Leiothrix lutea* (seen or heard during every observation period), (2) *Cettia fortipes* (locally common in dense undergrowth), (3) *Minla cyanuroptera* (present in many patches of bamboo), and (4) *Minla ignotincta* (seen several times on tree trunks and branches).

Bird density appeared to be greater in the *Symplocos*-dominated forests on smooth slopes and ridgetops at 1800–2000 m than in the *Fagus*-dominated forests on steep slopes at lower elevations, although only 20 species (34% of total) were noted in *Symplocos* forests. Also, different species occurred higher up, including *Chloropsis hardwickii, Musicapa thalassina, Phylloscopus reguloides* (common), *Garrulax milnei, Turdus boulboul* (common), *Monticola rufiventris* and *Sylviparus modestus*. Note, however, that 7 species (12% of total) were observed in both *Fagus* and *Symplocos* forests. Of these, several were those I found to be the commonest in *Fagus: Leiothrix lutea, Minla cyanuroptera, Alcippe cinereiceps, Cettia fortipes* and *Parus spilonotus*.

To what extent the altitudinal zonation and greater density at higher altitudes reflect biological reality is impossible to say with such a small sample size. *Symplocos* forests did seem to be less disturbed than *Fagus* forests, where I noticed a number of artificial (second-growth) clearings. Perhaps the higher-elevation *Symplocos* forests of the Maoershan Natural Reserve (except the area immediately around and below the TV station) are better protected from human activities than the lower *Fagus* forests. Clearly, logging extends (or extended) to the lower altitudinal range of *Fagus*. Isolated small stands, isolated trees, and snags are evidence that the lower part of the *Fagus* belt is vulnerable to human destruction.

In his paper on the montane forest (500–1100 m) avifauna of Guangdong, Mell (1925b) discussed ground foragers, undergrowth skulkers, tree foragers, canopy foragers, and summit "hunters". These guilds include some of the birds I saw at Maoershan. For instance *Cettia fortipes, Pomatorhinus ruficollis* and *Leiothrix lutea* were birds of the understory in both areas. More detailed comparisons are precluded, however, because unfortunately Mell (1925a) did not give complete lists of all birds he allotted to each foraging category, nor did he always list them by Latin names.

The fauna I sampled in beech forests of northern Guangxi resembles the fauna that is found in subtropical forests of the Himalayas, farther west in Asia, with its minivets, numerous babblers, and characteristic mixed flocks. Some species are clearly Himalayan, reaching in Guangxi their easternmost limit, whereas others (e.g. *Garrulax milnei*) are more localized to southern China, Indochina and Burma.

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Species status of *Geotrygon carrikeri*

by A. Townsend Peterson

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From collections made by M. A. Carriker, Jr., Wetmore (1941) described two new taxa of birds from the Los Tuxtlas region of southern Veracruz, Mexico. These taxa were a large form related to the sabrewing hummingbird *Campylopterus curvipennis* and a form related to the quail-dove *Geotrygon lawrencii* but disjunct from the remainder of the species' range by more than 1500 km. Wetmore described both as new subspecies.

Although the hummingbird has been studied in detail (R. C. Banks, pers. comm.) and elevated to species status (*Campylopterus excellens*; A.O.U. 1983), the quail-dove has remained in obscurity, with no reexamination of its distinctiveness (Goodwin 1977). On a recent visit to the U.S. National Museum of Natural History (USNM), I had the opportunity to compare the holotype and two other specimens of Wetmore's *G. l. carrikeri* with specimens from other populations of *G. lawrencii*. Being impressed with the distinctiveness of *carrikeri*, I argue in this communication for its elevation to a full species.

Wetmore listed eight characters that differentiate *carrikeri* from other populations of *G. lawrencii*. I reexamined these characters, comparing the three adult female specimens of *carrikeri* at the USNM with one female, two male, and one unsexed *lawrencii* from Panama. The *carrikeri* specimens have somewhat paler coloration above, the centre of the back and the scapular areas lighter and more purplish, the wing coverts and tail distinctly lighter brown, the lower back and rump distinctly lighter, the malar stripe distinctly wider, and the sides and flanks strikingly paler brown (chocolate in *lawrencii*, light brown in *carrikeri*). That *carrikeri* has a lighter and brighter green crown, hindneck, and upper back, and whiter undertail coverts (Wetmore 1941) was not so obvious to me, given the pronounced individual variation in the small series available. Additional differences in coloration between the two forms include the absence of dark purplish iridescence on the upper surface of the rectrices in *carrikeri*, and the light grey (as opposed to slaty) chest of *carrikeri*.

Beyond differences in coloration, *carrikeri* is a distinctly larger bird than other populations of *G. lawrencii*. Wing chords of the three *carrikeri* females are 149, 150 and 146.5 mm (USNM 359656, 359655 and 359654, respectively), compared with 131 (USNM 483334 female), 135 (USNM 148348 unsexed), 139.5 (USNM 484281 male), and 137 mm (USNM 476039 male) in *G. l. lawrencii*. Tail lengths in the same individuals are 87, 89 and 83 mm in *carrikeri*, compared with 73, 67, 70 mm and unmeasurable in *G. l. lawrencii*; and exposed culmens are 14.88, 16.32 and 15.88 mm in *carrikeri*, compared with 13.83 mm, unmeasurable, 13.08 and 14.03 mm in *G. l. lawrencii*. Differences in tarsus length were minimal. An additional difference may or may not lie in egg colour: Andrle (1967) reported an egg of *carrikeri* to be "a plain, pale pinkish colour", whereas Olson *et al.* (1968) described an egg of *G. l. lawrencii* as "very pale buff (cream)".

Although Wetmore (1941) clearly considered *carrikeri* to be very distinct from other populations of *G. lawrencii*, subsequent workers evidently have not appreciated the differences, perhaps owing to the scarcity of specimens of both forms. *Carrikeri* is well differentiated from other *G. lawrencii* populations in several aspects of plumage coloration, and the two have non-overlapping ranges of several mensural characters. Although the two forms would certainly be considered separate phylogenetic species (McKitrick & Zink 1988), the large disjunction separating them precludes the test of sympatry critical to a decision under the biological species concept. Recent decisions under this concept have tended toward recognition of disjunct differentiated forms as full species (e.g. Banks 1990, Escalante & Peterson 1992), so I suggest that *carrikeri* would be best treated as a full species forming a superspecies with *G. lawrencii*. The relationships of these two forms with other potentially closely related quail-doves such as *G. costaricensis, G. goldmani, G. saphirina*, and perhaps even *G. veraguensis*, merit further study.

In a recent summary of avian diversity patterns in Mexico, two colleagues and I surveyed levels of species richness and endemism in 35 regions of Mexico (Escalante *et al.* in press). In that analysis, we were surprised to find that the Los Tuxtlas region presented one of the lowest levels of endemism in all of Mexico, holding only one species endemic to Mexico. This result was surprising because of the extreme isolation of the montane habitats in the region. However, with the recognition of *Campylopterus excellens* as a full species (A.O.U. 1983), the evidence presented above for the species-level differentiation of *Geotrygon carrikeri*, and evidence of extreme differentiation of the Los Tuxtlas populations of the bush-tanager *Chlorospingus ophthalmicus* and the brush-finch *Atlapetes brunneinucha* in allozyme characters (Peterson *et al.* 1992), levels of isolation, endemism, and differentiation in the birds of the region can be seen to be nontrivial.

The conservation status of those endemic forms is, unfortunately, of increasing concern. Deforestation is taking place at a high rate in the region on both the Volcán de San Martín and the Sierra de Santa Martha. Small ranches and other settlement are being built higher and higher on the slopes of both mountain ranges. Although a small patch of lowland tropical rain forest is protected as the Estación Biológica de Los Tuxtlas, and various plans for protecting the montane parts of the region have been advanced, the forests of the Los Tuxtlas region remain all but unprotected.

Acknowledgements

R. C. Banks should be thanked for initiating this problem by suggesting that we "check the specimens" at the U.S. National Museum. Thanks also to P. Escalante-Pliego for critical comment on the manuscript.

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Sexual selection for novel partners: a mechanism for accelerated morphological evolution in the birds-of-paradise (Paradisaeidae)

by Leslie Christidis & Richard Schodde

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In morphological form and behavioural display, the 40–45 species of birds-of-paradise (Paradisaeidae) currently recognized (Mayr 1962, Sibley & Monroe 1990) are one of the most spectacular and diverse families of passerines. Recent molecular studies indicate that this diversity has arisen rapidly. Thus in a protein allozyme study, Christidis & Schodde (1992) found genetic distances (Nei 1978) ranging from only 0.09 to 0.37 among six morphologically distinct genera of paradisaeine birds-of-paradise. Using the avian protein molecular clock of Marten & Johnson (1986), the following dates of divergence can be estimated for the genera examined by Christidis & Schodde (1992). The manucodes (*Manucodia*) and the paradisaeine lineage of polygynous species split from one another 7 million years ago, the riflebirds (*Ptiloris*) from the core polygynous clade 4 million years ago, and then the remaining genera examined—*Cicinnurus, Epimachus, Parotia* and *Lophorina*—from one another within the last 2 million years. These dates are proportional to, though considerably less than, those calibrated from DNA-DNA hybridization by Sibley & Ahlquist (1985). According to their data, manucodes diverged from other paradisaeines some 18 million years ago, and most polygynous genera from one another within the last 4 or 5 million years. Irrespective of the accuracy of these estimates, it seems clear that the polygynous New Guinean birds-of-paradise exploded into their present array of forms recently. Palaeogeographic events match the protein data in particular. The massive cordilleras in which the New Guinean radiation in paradisaeines is centred today were raised only 2 to 3 million years ago, after connections with ancestral stocks of Australian-centred *Ptiloris* would have been sundered (Doutch 1972, Dow & Sukatmo 1984).

What factors can account for such a rapid rate of morphological change? Two which have been proposed are sexual selection (Darwin 1871) and niche shifts (Diamond 1986). Diamond (1986) has compared the diversification in birds-of-paradise to radiations in other Pacific island passerines, the Hawaiian honeycreepers (Drepanididae) and Darwin's finches (Geospizinae). Diversification in these groups is believed to have been driven by exploitation of suites of niches unoccupied by other birds. Such circumstances, however, do not apply to the birds-of-paradise which, in contrast, have evolved *in situ* within the continental Australo-Papuan avifauna, alongside pigeons, orioles (Oriolidae) and the larger honeyeaters (Meliphagidae) which use the same range of niches: arboreal frugivory and insectivory. Shifts in environmental selection for natural variants are also unlikely to explain paradisaeine diversity because individual variation within populations is no greater than in other species of birds (Diamond 1986).

If sexual selection is the principal force that has driven morphological divergence within the birds-of-paradise, what is its underlying mechanism? Diamond (1991:176) has suggested that the 'handicap model' of Zahavi (1975) may operate in birds-of-paradise. According to this controversial hypothesis, secondary sexual characteristics may in fact operate to reduce the ecological fitness of their carriers. Furthermore, characters such as bright and conspicuous plumage serve to highlight to the opposite sex the underlying competence of any individual capable of flourishing despite such disability.

Another possible mechanism is the 'runaway' selection hypothesis proposed by Fisher (1930). According to this model, a female inherits genes from her male parent that predispose her to prefer a particular trait in males—long gaudy tail feathers for example. Males with gaudy tail feathers pass genes continuously to their daughters that compel them to choose males with ever gaudier tail feathers, accelerating a cycle of 'runaway' evolution. In support of this model, Andersson (1982) found that female Long-tailed Widowbirds *Euplectes progne* preferentially chose males that had had their tails artificially lengthened.

One consequence shared by both 'handicap' and 'runaway' selection models is the accentuation, through sexual selection, of variation already present in the population. Thus constrained, these mechanisms do not seem to explain either the range or rapidity of morphological evolution in polygynous paradisaeine birds-of-paradise. Instead, we postulate that preference by females for a mate that is novel or unique provides the answer.

Ten Cate & Bateson (1988) have suggested that preference for conspicuous and slightly novel partners may evolve in some instances to avoid inbreeding. This is usually offset by imprinting, through which mate preference is affected by learning the appearance of the opposite sex from parents. In polygynous species, however, males do not tend the young and so female chicks have no male model on which to imprint. Male chicks may learn the form of the mother, but, as is well-known (Diamond 1972), female paradisaeines are mostly similar in plumage and unlike the diversely plumaged males. Such a situation, in which females, unconstrained by early imprinting, are attracted to novel males, could lead to a cycle driven by preferences for gross mutations. Female selection for novelty in this form may in turn compensate for any initial ecological or physiological disadvantage produced by major mutations. Because of breeding structure, furthermore, effective population size will be lower in polygamous that monogamous species. Therefore, any mutation or hybrid trait conferring such a selective advantage should become fixed rapidly in polygamous species.

Such a mechanism may also account for the occurrence of sporadic inter-generic hybridization in birds-of-paradise (summarized in Table 1). In those species of birds-of-paradise where mating behaviour has

TABLE 1

Hybridization recorded between genera of birds-of-paradise (from Stresemann 1930, Mayr 1962, Gray 1958, Fuller 1979). Key: +=hybrids recorded, P=polygynous, ?=no data, A=allopatric, A?=possibly some contact in range

	Mating system	1	2	3	4	5	6	7	8	9
1 *Astrapia*	P	***								
2 *Epimachus*	P	+	***							
3 *Lophorina*	P		+	***						
4 *Parotia*	P			+	***					
5 *Cicinnurus*	P	A		+		***				
6 *Paradisaea*	P				+	+	***			
7 *Paradigalla*	?		+	+	+	A	A?	***		
8 *Seleucidis*	P	A	A?	A	A		+	A	***	
9 *Ptiloris*	P	A		+	A?		+	A	+	***
10 *Pteridophora*	P			A	A?	A	A		A	A

been studied in detail, it appears that females actively choose males on the basis of display and plumage characters to maximize 'fitness' of their offspring (e.g. Pruett-Jones & Pruett-Jones 1990). In such species, interspecific hybridization should be eschewed. In paradisaeines, nevertheless, hybridization not just between species but even 'genera' does occur (Table 1). In that table, *Paradisaea* × *Parotia* is newly recorded, represented by an individual *Paradisaea rudolphi* × *Parotia lawesii* in feminine plumage from Baiyer River, Papua New Guinea, in the Australian Museum (AM 0.40100); it has the ventral markings and dusky bill of *Parotia lawesii* and the all black head, white orbital marks and heavy decurving bill of *Paradisaea rudolphi*. From Table 1, it is evident that hybrids have been recorded between most polygynous genera that are sympatric. Because natural hybridization in other avian families invariably involves species that resemble one another (Gray 1958), some of these crosses, as between *Astrapia* and *Epimachus* and between *Lophorina* and *Cicinnurus*, are extraordinary, so different are the parental taxa in morphology and plumage patterns. Under the mechanism of sexual selection proposed here for birds-of-paradise, preference for novel or unique males would account for such inter-generic hybridization.

According to this interpretation, female choice in birds-of-paradise differs from the 'relative choice' model of Lande (1981) and Zuk *et al.* (1990), which has females comparing males to select those with the most exaggerated form of secondary sexual characters, irrespective of the nature and frequency of the trait. In our model, female choice is directed towards the male with the most unique or different form of secondary sexual character. It is a model that can be tested by simple experimentation in the field. For example, the plumes of selected males could be altered in colour and shape, and mating success recorded before and after modification. Traits could be altered either to accentuate present variation (*cf.* Andersson 1982), or to appear as new.

Species such as those of *Paradisaea*, which congregate conspicuously at display trees, would be ideal for such investigation, particularly as they form hierarchies in dominance (Beehler 1989) which could be changed by modifying the plumage of individual males. According to the mechanism canvassed here, we predict that mating success will increase significantly in those males altered most radically from the norm.

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Subspeciation in the austral African Thick-billed Lark

by P. A. Clancey

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The range of the Thick-billed Lark *Galerida magnirostris* (Stephens), 1826: near Cape Town, of the extreme south-west of the Afrotropics is limited to country extending from *c.* 28°S in Namibia south to Cape Agulhas in the west and to about 29°25′E on the Lesotho/Natal border in the east. In the western and central parts of its distribution it affects coastal districts and agricultural land, and is a characteristic species of the Karoo sector of the interior of the Cape, to the east of which it occurs in grassland on the continental plateau and the alpine zone of the Drakensberg Mts. While it is in the main sedentary, in the eastern highland parts of the range there is a measure of post-breeding altitudinal movement.

The main climatic zones and variable habitat-types affected by this lark are reflected in a regionally disposed sequence of mensural and plumage colouration variables, with heavily billed and reddish populations present over much of the west and somewhat greyer and finer billed differentiates in the more mesic east. The subspecific variation in so far as it affects Cape birds was considered by Winterbottom (1957). The whole species was first adequately reviewed some twenty years ago by Quickelberge (1970), when three subspecies of this southern African endemic lark species were recognised: the nominate race; *G. m. harei* (Roberts), 1924: Philipstown, northeastern Cape; and *G. m. montivaga* (Vincent), 1948, from the eastern Lesotho highlands. In an earlier communication, Clancey (1963) demonstrated that it was perhaps desirable to recognise a further subspecies from the singularly arid northwestern sector of the species' range, but Quickelberge viewed the population in question as part of *G.m. harei* on the basis of the evidence then available and largely on similarity in overall size. The recent finding of *magnirostris* in the southern parts of Great Namaqualand, Namibia (Clancey 1989), and the examination of a specimen from the said territory, has occasioned a re-assessment of the case, as this example is not referable to *harei*, resulting in a taxonomic realignment of the bulk of the populations and the introduction of a new name.

The marked west–east pattern of decline in bill-size in the Thick-billed lark (Table 1) closely parallels that present in the Sabota Lark *Mirafra sabota* Smith, which lies mainly to the northeast of *magnirostris*, but with extensive sympatry where their ranges overlap. The range of substrate-types and their attendant vegetational shifts are, however, markedly wider for *M. sabota*, and the extent of its subspeciation is correspondingly greater than in *G. magnirostris*. In dealing with regional variation in bill-size in southern African alaudids, brief mention may be made of the robust bill of the highly localised

TABLE 1

Wing, tail and culmen lengths (mm) in 109 specimens of the Thick-billed Lark *Galerida magnirostris*.

			n	Range	Mean	s.d.
G.m. magnirostris	♂	Wing	15	98–103	100.7	1.53
		Tail	15	54–60	57.6	1.96
		Culmen	15	21.7–23	22.1	0.78
	♀	Wing	8	93–99	96.5	1.72
		Tail	8	54–57	55.5	1.41
		Culmen	8	20.5–22.5	21.4	0.72
G.m. sedentaria	♂	Wing	38	104–110.5	106.7	1.65
		Tail	38	60–68.5	63.4	2.24
		Culmen	38	20–23	21.6	0.87
	♀	Wing	28	98–103	100.6	1.33
		Tail	28	57–64	60.0	1.69
		Culmen	28	19–22.5	20.8	0.91
G.m. harei	♂	Wing	12	102.5–109.5	105.8	2.24
		Tail	12	60–67	63.4	2.53
		Culmen	12	18–20	19.0	0.67
	♀	Wing	8	96–101.5	98.5	1.86
		Tail	8	54.5–60	57.8	2.11
		Culmen	8	18–20	18.5	0.77

Statistical analysis. Wing- and tail-lengths combined, *G.m. magnirostris* ♂♂ (158.36) vs *G.m. sedentaria* ♂♂ (170.23): t=12.3148, df=51, P<0.001. *G.m. magnirostris* ♀♀ (152.06) vs *G.m. sedentaria* ♀♀ (160.48): t=9.0046, df=34, P<0.001. Culmen-length, sexes combined, *G.m. harei* (18.86) vs *G.m. sedentaria* (21.32): t=10.3041, df=84, P<0.001.

sympatric Red Lark *Certhilauda (albescens) burra* (Bangs) of the red sand-dune country immediately south of the lower Orange R. in Bushmanland and adjacent parts of the northwestern Cape Province. In this instance evident correlation between bill-mass and feeding strategy and ground texture is wanting, as the Red Lark favours soft, shifting sandy terrain. It is noteworthy that in these larks there may be extreme plasticity in bill-form within the limits of a single polytypic species inhabiting a wide spectrum of substrate and vegetational complexes, so that bill-size should be used with circumspection as a criterion in the recognition of species-level taxa.

Variability in the Thick-billed Lark's wing- and tail-lengths is limited, with the smaller sized of the two readily definable groupings of populations centred on the Winter Rainfall District of the southwestern Cape and constituting the nominate subspecies. In this population, wings in males are <103, in females <97, and tails respectively <60 and <56 mm. The other populations of the species are on the whole larger: wings in males >102, females >100, tails >80 and >58 mm, with little regional difference between west and east, even in the case of the montane population present in the extreme east of the range. The populations of *G. magnirostris*, like those of *M. sabota*, polarise on the basis of bill-mass into two well-defined groups, the western heavy-billed differentiates being divisible on the basis of overall size, as outlined above, into two subspecies. For one of these a name is introduced. In the case of the shorter and weaker billed eastern populations, two races are currently recognised, but a critical study of material of both forms—*G. m. harei* and *G. m. montivaga*—indicates that *montivaga* was based on a study of Lesotho specimens (*montivaga*) and others from the Karoo regions of the Cape rather than of *harei* named from the Philipstown district of the northeastern Cape/Orange Free State border region. In effect, *montivaga* is simply a redescription of *harei*. Quickelberge (1970) also concluded that *montivaga* was poorly differentiated, but again confused the issue by equating *harei* with the birds of the Karoo rather than those present to the immediate east and northeast of this biome.

Conclusions reached as a result of the present enquiry are in close agreement with the earlier findings of Quickelberge in that three races require to be recognised, but that, in contrast to Quickelberge's arrangement, the race *G. m. montivaga* will need to be subsumed in the much earlier *G. m. harei*, and the Karoo populations—the *harei* of certain authors, as stated above—accordingly described as a new race.

Heavy-billed western races

Galerida magnirostris magnirostris (Stephens), 1826: Near Cape Town, Cape Province.

Alauda crassirostris Vieillot, 1816, pre-occupied by *Alauda crassirostris* Pennant, 1769.

? *Alauda rostro-crassa* Wilkes, *Encyclopaedia Londinensis*, vol. i 1808, p. 235 (same Levaillant basis as *Alauda magnirostris* Stephens, 1826). See Clancey & Brooke (1990).

Upper-parts with relatively broad black shaft-streaking, the feathers edged greyish Cinnamon-Buff (Ridgway 1912), imparting a mealy effect. Below, breast pale yellowish buff, broadly streaked blackish brown; rest of ventral surface creamy or yellowish white, with the sides washed and streaked greyish. Bill relatively long and robust, but wing- and tail-lengths in both sexes shorter than in the other races (Table 1). Hind-claw >*c.* 14 mm.

Range. Winter Rainfall District of the southwestern Cape, from about the lower reaches of the Oliphants R. to Cape Agulhas, eastwards to about 22°15′E in the southern Cape. Intergrades with *G. m. sedentaria* to the immediate east of its stated range, as at Oudtshoorn in the southern Cape. Coastal birds to the north of the lower Oliphants, as far as Port Nolloth at 29°14′S, 16°52′E, are like nominate *magnirostris* in colouration, but have the longer wing- and tail-lengths of *sedentaria*. They are best treated as part of this race.

Remarks. Intergradation between *G. m. magnirostris* and *G. m. sedentaria* in the south of the Cape differs from that described in respect of birds from north of the lower Oliphants R., in that a sample from Oudtshoorn, in the Little Karoo, agrees with *sedentaria* in the rufescent colouration of both upper- and under-parts. In their average shorter wings (in 3 ♀♀ 101.5, 97, 96.5 mm) they incline, however, towards the nominate race lying to the west, but in their tails of 58, 63.5 and 64 mm they correspond entirely with *sedentaria* of the Karoo system.

Galerida magnirostris sedentaria subsp. nov.

Type. ♂, adult. 8 miles west of Khubus (Kuboes), Richtersveld, lower Orange R., northwestern Cape Province. 19 August 1960; collected by Dr M. Courtenay-Latimer. In the collection of the East London Museum, Mus. Reg. No. 8577.

Description. Dorsal streaking browner than in the nominate race (about Mummy Brown), the feather edges redder (Buckthorn Brown, *versus* greyish Cinnamon-Buff). Face more reddish and supercilium deeper buff. On underside with the ground-colour of the breast deeper buff (Light Ochraceous-Buff), the streaking often heavier, and the rest of the venter less clear, more buffy, white. Differs from the nominate race in having a longer wing and tail, the bill similarly robust; mean wing of ♂ 106.7, tail 63.4, ♀ 100.6 and 60.0, *versus* 100.7, 58.6, and 96.5, 55.5 mm respectively in nominate race (Table 1).

Measurements of the type. Wing (flattened) 107, tail 63, tarsus 27, culmen from skull 23, hind-claw 14 mm.

Specimens examined. 70. **Namibia**: 6.1 miles E of Rosh Pinah; **Lower Orange R., Cape Province**: Alexander Bay, Khubus, Arrisdrift, Vioolsdrif, Namies Mine, Pofadder; **Little Namaqualand and Karoo**: Steinkopf, Konkiep, Klipfontein, Springbok, Wallekraal, Vanrhynspas, Vanrhynsdorp, Nieuwoudtville, Calvinia, Williston, Fraserburg, Beaufort West, Aberdeen, Oudtshoorn; **West Griqualand**: Rietfontein (Griquatown).

Range: Southwestern Great Namaqualand, Namibia, with records from Oranjemund and Rosh Pinah, the Richtersveld and Little Namaqualand from the Succulent Karoo of the plateau, eastwards through the Karoo regions of the Cape interior to about Graaff-Reinet (32°15′S, 24°32′E), and north of the mid-Orange to the Karoo country of West Griqualand.

Etymology. *Sedentaria* from Latin to sit, in allusion to the nonmigratory disposition of the species.

Remarks. Attention was first drawn to this race in Clancey (1966: 412), when a more circumscribed range than that now given was favoured. However, in the Second Supplement to my *Catalogue* (Clancey 1972) I adopted Quickelberge's arrangement of the populations into three races, which accords in the main with the grouping adopted here.

Short, slender-billed eastern race

Galerida magnirostris harei (Roberts): 1924: Philipstown, northeastern Cape.

Calendula magnirostris montivaga Vincent, 1948: Sanqubetu Valley, northeastern Lesotho.

Differs from *G.m. sedentaria* in being less rufous over the upperparts, the dark shaft-streaking Sepia, the light fringes to the feathers dull

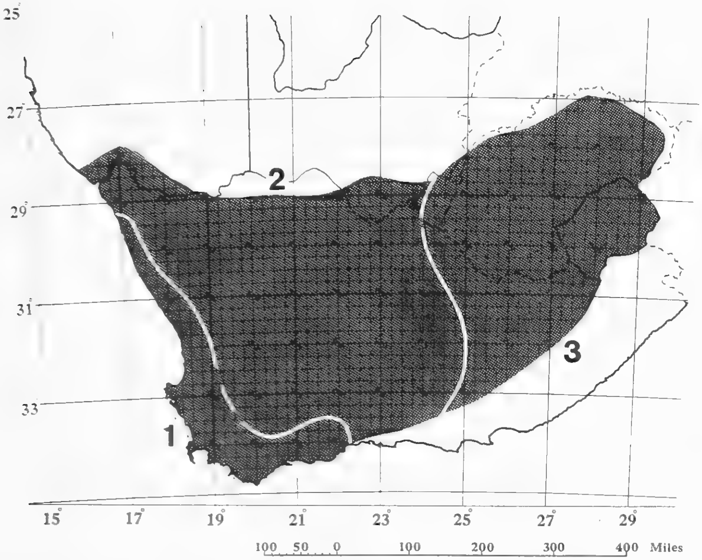

Figure 1. Distribution of the Thick-billed Lark *Galerida magnirostris* and its three subspecies: 1, *G. m. magnirostris* (Stephens); 2, *G. m. sedentaria* Clancey; 3, *G. m. harei* (Roberts). The population of *G.m. magnirostris* distributed narrowly along the coast north of *c*. 31°15′S retains the colour characters of *magnirostris* but has the longer wing and tail measurements of *sedentaria*.

Cinnamon-Buff. Ventrally, breast Light Buff with duller and more greyish-black streaking; rest of underside yellowish-white, lacking the sandy nuance, and in this not unlike the nominate race. Bill shorter and less robust, best marked in the adult male (see Table 1). Hind-claw ranging shorter in both sexes. The coefficient of difference (Mayr *et al.* 1953) for both sexes in the bill-length variable compared with *sedentaria* is 1.42 (just above 92% joint non-overlap); 86 specimens utilised.

Range. Distributed generally to the immediate east and northeast of *sedentaria* from *c*. 24°E and the mid- and upper drainage fan of the Great Fish R. in the eastern Cape to the Orange Free State, Lesotho, southwestern Transvaal (collected at Bloemhof in the Orange Free State in September 1987), and the region of the lower Vaal R. in the eastern sector of the northern Cape. Cold-season altitudinal movement of high elevation breeders results in occurrence of *G.m. harei* in western Natal on occasion.

Remarks. Roberts (1924) gives only a shorter bill as a distinguishing character for this race, and the range as extending from the Orange Free State to the central Cape. He gives the exposed culmen-length in males as 16–18, *versus* 19–21 in the nominate subspecies, and *c*. 14–16 and 18.5 mm respectively in females. The number of specimens available was not given. Three male and two female topotypes or near-topotypes of *harei* from Philipstown (type-locality), Petrusville district and Philippolis, Orange Free State, had bills from skull 18–20 (19.0), while five *montivaga* from the alpine heights of the Drakensberg in the northeastern Cape and Lesotho also had bills 18–20 (18.7) mm. In a larger sample of material from Lesotho, Quickelberge (1970) determined the average culmen-length from the skull in males to be 19.4 (n=10) and in females 18.4 (n=4) mm. These data confirm that there is no taxonomically useful difference in bill-length between the birds breeding in the mountains of Lesotho and adjacent territories and those of the northeastern Cape and the western Orange Free State. In addition, as no difference could be found between Lesotho and eastern Cape and Orange Free State specimens in either dorsal or ventral colouration, *montivaga* of 1948 will require to be treated as a synonym of *harei* of 1924.

Acknowledgements

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A taxonomic review of the Green-fronted Hummingbird

by Steve N. G. Howell

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The Green-fronted Hummingbird *Amazilia viridifrons* is endemic to southern Mexico in the states of Guerrero, Oaxaca and Chiapas. Among Mexican and Central American hummingbirds, the combination of its bright white underparts and bright red, black-tipped bill is shared only by the Violet-crowned Hummingbird *A. violiceps* of northwestern and central Mexico. Like several other Mexican hummingbirds, the taxonomy and distribution of *viridifrons* has been confused in the literature.

Distributional and taxonomic history

Friedmann *et al.* (1950) defined the range of *A. viridifrons* as "Central Oaxaca and central Guerrero south to Chiapas". At the same time, those authors and the A.O.U. (1957) reported the range of the closely related *A. violiceps* as extending south to Chiapas. Phillips (1964), however, in providing the first clear account of the ranges and historical taxonomy of *viridifrons* and *violiceps*, considered records of *violiceps* from southern Oaxaca and Chiapas equivocal, a conclusion followed tentatively by Binford (1989) and apparently accepted (without comment) by A.O.U. (1983) who defined the range of *violiceps* as "south to Oaxaca, Puebla and Hidalgo". My field and museum investigations have also revealed no viable evidence that *violiceps* occurs farther south than Guerrero and northwestern Oaxaca.

Most authors (e.g. A.O.U. 1983, Binford 1989, Friedmann *et al.* 1950) have treated *viridifrons* as a species. Phillips (1964), however, considered *viridifrons* as a subspecies of *violiceps*. He pointed out that the two forms were not known to breed sympatrically, and that the overlap in their ranges might be due to unknown movements of *A. violiceps*.

In life the two forms are quite distinct, and their call notes are readily distinguishable: *violiceps* gives hard strong chips and chatters reminiscent of Cinnamon Hummingbird *A. rutila*, while *viridifrons* gives distinctly different, soft dry chips and chatters suggesting Broad-billed Hummingbird *Cynanthus latirostris*. In addition, *A. v. violiceps*, the southern subspecies of Violet-crowned Hummingbird, is not known to be migratory, although local wandering probably occurs, e.g. all Oaxaca records to date are between July and October (Binford 1989). While both forms may occur at the same locations in Guerrero, at least seasonally, they favour different habitats there: *violiceps* occurs mainly in tropical arid thorn scrub of the Rio Balsas drainage, while *viridifrons* occurs mainly in more temperate arid oak scrub (pers. obs.). In view of these facts, and that the two forms are visually quite distinct, with no hybrids known, I also consider *viridifrons* and *violiceps* as separate species.

Friedman *et al.* (1950) considered *viridifrons* monotypic. Following explorations in previously unknown areas of southern Oaxaca in the 1960s, Phillips (1964) described the distinctive subspecies *A. violiceps (=viridifrons) wagneri*, characterized as "redder on the wing, sides, flanks, sides of crissum and a line bordering the white up to the face and extending narrowly to the bill. Also [redder] on the tail and edges of the upper tail-coverts" (translated here from the Spanish). He considered birds from interior Oaxaca (Totolapan to the vicinity of Nejapa) as intermediate between nominate *viridifrons* and *wagneri*.

Binford (1989) most recently discussed *viridifrons* and pointed out that "*wagneri* . . . apparently separates two identical populations of *A. v. viridifrons*". He suggested the possibility that *wagneri* might be specifically distinct "if the extreme amount of variation in the intensity and extent of rusty coloration in *wagneri* can be accounted for by age and sex rather than geography". It should be noted that Binford (1989) treated all birds from Totolapan to Nejapa as *wagneri* (based mostly on their conspicuously cinnamon flanks rather than a full consideration of all *wagneri* characters), although he recognized that many appeared intermediate between *wagneri* and *viridifrons* (L. C. Binford pers. comm.).

Here I review the taxonomy of *A. viridifrons* and describe a new subspecies of it from central Oaxaca.

Methods and results

I examined 113 specimens of *A. viridifrons*, 110 of which were assembled for direct comparison at the California Academy of Sciences; these represent virtually all specimens of *viridifrons* in North American collections. In addition, between 1983 and 1992 I travelled throughout the range of the Green-fronted Hummingbird and gained extensive field experience with it at numerous points between southern Guerrero and western Chiapas.

When specimens were arranged by geography, sex, and age, four groupings became apparent: (1) Guerrero and western Oaxaca; (2) central Oaxaca; (3) southern Oaxaca and western Isthmus of Tehuantepec; and (4) eastern Oaxaca and Chiapas. However, as Binford (1989) pointed out, birds from Guerrero and western Oaxaca are essentially identical to birds from eastern Oaxaca and Chiapas. Figure 1 shows the distribution in the state of Oaxaca of the three forms described below.

Sex and to a lesser extent age were determined by the collectors' labels (apparently almost all correct) supported, for sex, by bill length (longer in females) and crown colour (typically darker in males, as first noted by Phillips 1964). Juveniles were identified by bill grooving, a mostly blackish upper mandible, rusty tips to crown and upperpart feathers, and distinct pale cinnamon tips to outer rectrices. Immatures (birds lacking bill grooving and often showing signs of first prebasic moult) often could be identified by unworn and/or retained pale

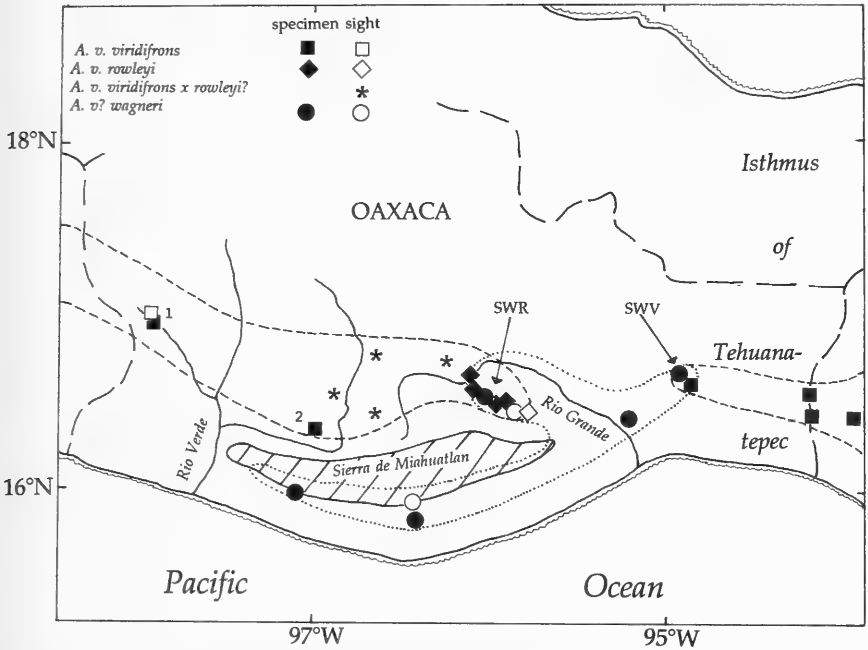

Figure 1. Distribution of Green-fronted Hummingbirds in the state of Oaxaca. Dotted line indicates the range of *wagneri*, dashed line indicates the ranges of nominate *viridifrons* and *rowleyi*. 1=Putla de Guerrero, 2=km 136. SWR: sympatry of *rowleyi* and *wagneri* (vicinity of Tototalpan SE to Nejapa and El Camaron). SWV: sympatry of nominate *viridifrons* and *wagneri* (12 miles NE of Juchitán).

cinnamon tips to their upperparts and in particular by pale tips to their outer rectrices.

Colour charts do not treat metallic or iridescent colours, and colour descriptions in the following accounts are my own interpretations. Most of the colours should be self-evident, e.g. copper being redder than bronze, cinnamon being redder than vinaceous, etc. Purplish-copper indicates copper tinged with purple, etc.

The characters of the birds from these four areas (comprising three forms) are as follows, including available data on nesting periods derived from Binford (1989), Rowley (1966, 1984), juvenile specimens, and personal observations. Immatures examined include juveniles, but juveniles were excluded from culmen measurements (culmen range given in mm; followed by mean length).

Amazilia viridifrons viridifrons (Elliot)

Cyanomyia viridifrons Elliot, 1871, *Ann. & Mag. Nat. Hist.* (4) 8: 267. "Putla, Mexico"=Putla de Guerrero, Oaxaca.

Diagnosis. **Western population** (see range, below). *Upperparts*. Crown blackish with oily green to bluish-green sheen in ♂; dark green in ♀ and immature ♂. Nape, mantle, and chest sides bright, deep, emerald green; lower back to upper tail-coverts dull bronzy to grey-brown. *Underparts.* Flanks mottled bronzy-green on a dusky to dusky-vinaceous wash, often with pale cinnamon spots on hind flanks; vinaceous in flanks strongest in 2 ♂♂ (WFVZ 21492, 21537) from km 136 on the Puerto Escondido Road. Axillars dusky or, in 4 of 6 ♂♂ from Puerto Escondido Road, mixed with pale cinnamon. Under tail-coverts may have faint dusky pale cinnamon spots on basal coverts and, less often, faint pale cinnamon shaft streaks on distal coverts. *Wings.* Secondaries lack any cinnamon at bases. Marginal wing-coverts cinnamon to pale cinnamon in ♂, dull pale cinnamon in ♀. *Tail.* ♂: burnished copper to purplish-copper with narrow bronzy-green edgings. Immature ♂: mostly deep purplish with narrow pale cinnamon tips to outer rectrices. ♀: bronzy to greenish-gold, with little or no burnished copper or purple.

Eastern population. Very much like western birds but ♀♀ and immatures often have the crown darker (very dark green), five such individuals showing a slight oily blue-green sheen to the crown; the flanks and axillars tend to be more extensively whitish with less bronzy-green spotting and little or no vinaceous wash; tails of ♂♂ and ♀♀ are frequently similar to one another (i.e. ♂♂ having less purple and ♀♀ more copper than western birds); and the bills may average longer. Due to a larger sample size than the western population, some characters of eastern birds are given here. *Underparts.* Flanks and axillars: in ♂, mostly whitish with some bronzy-green spotting and usually a slight dusky vinaceous wash (most pronounced on rear flanks where may become pale vinaceous-cinnamon spots); immature ♂ similar but with a stronger vinaceous-cinnamon wash and less bronzy-green spotting; ♀ similar to ♂ but averages more whitish with little or no dusky cinnamon wash; immature ♀ similar to ♀ but with stronger dusky cinnamon wash. Under tail-coverts usually clean white but rarely (2♀♀ from Chiapas) with faint pale cinnamon spots on basal coverts. *Tail.* ♂: bronzy-copper to (rarely) purplish-copper with narrow bronzy-green edgings (sometimes indistinct). Immature ♂: purplish-copper (2 birds) to bronzy (3 birds), with narrow pale cinnamon tips to outer rectrices. ♀: similar to ♂ but averaging more bronzy, less coppery. Immature ♀: purplish-copper with narrow pale cinnamon tips to outer rectrices.

Despite average differences, some eastern birds appear indistinguishable from some western birds of corresponding age and sex and thus I consider that the eastern population does not warrant subspecific recognition.

Range. Disjunct. Western population: Guerrero, S and E of the Rio Balsas, and western Oaxaca, at elevations of 730 to 1400 m. Occurs in the Sierra Madre del Sur and adjacent arid valleys from the vicinity of Chilpancingo, Guerrero, E to km 136 on Highway 131, the Puerto Escondido Road, Oaxaca. Apparent range break between these two areas may reflect lack of collecting in this remote area. The westernmost record is San Vicente de Benitez, Guerrero, where I saw one bird in humid forest edge on 21 and 23 May 1990; apparently only a visitor to this area (pers. obs.). No nesting data. Specimens examined: 9♂♂, 2 immature ♂♂, 4♀♀, 1 immature (sex?). Culmen: 11 ♂♂ (19–22.5, 21.3); 3 ♀♀ (21.4–24.2, 22.8).

Eastern population: Pacific slope foothills of eastern Oaxaca (W to 12 miles NE of Juchitán) and western Chiapas, and interior valley of Chiapas, at elevations of 60–1300 m. The easternmost record is 27 km by road N of Motozintla, Chiapas, where I saw one bird on 4 January 1992. Nesting in at least Apr–Jun. Specimens examined: 16 ♂♂, 5 immature ♂♂, 14♀♀, 1 immature ♀. Culmen: 21 ♂♂ (20.3–23.1; 21.9); 15♀♀ (21.6–24.4; 23.1).

Amazilia viridifrons rowleyi, subsp. nov.

Holotype. WFVZ No. 19600; male (testes 2 × 2 mm) from 13 miles south of Matatlan (=Santiago Matatlán), Oaxaca, Mexico, elevation 4300 feet; collected by J. S. Rowley on 1 April 1968, original field number 5540.

Diagnosis. Appears intermediate between *A. v. viridifrons* and *A. (v?) wagneri* but closer to the former from which it differs in more extensively vinaceous-cinnamon flanks and axillars, duller upperparts, concealed cinnamon bases to secondaries of adult ♂, broader cinnamon tips to outer rectrices of immature, and less sexual dimorphism in culmen length, in these last three features approaching *wagneri*. Readily distinguished from *wagneri* by duller and less extensive cinnamon on flanks and axillars, lack of rufous or dull cinnamon on wings except as concealed patch in adult ♂, and bronzy to purplish-copper tail. **Upperparts**. Crown blackish with oily green to bluish-green sheen in ♂; dark green in ♀ and immature ♂. Nape, mantle, and chest sides bronzy green, duller than nominate *viridifrons*, feathers on chest sides narrowly edged pale vinaceous-cinnamon, more distinctly so in ♂♂; lower back to upper tail-coverts dull bronzy to grey-brown. **Underparts**. Flanks and axillars: in ♂, mottled to washed vinaceous-cinnamon to dull cinnamon, usually with some bronzy-green spotting, axillars often brighter, vinaceous-cinnamon; immature ♂ brighter, vinaceous-cinnamon to cinnamon with only a few bronzy-green spots; ♀ dusky vinaceous-cinnamon, duller than ♂, spotted bronzy-green; immature ♀ vinaceous-cinnamon, brighter and with, on average, less bronzy-green spotting than ♀. Under tail-coverts usually (but not always) with fairly distinct pale cinnamon spots on basal coverts, rarely with faint pale cinnamon shaft streaks on distal coverts. **Wings**. Concealed cinnamon to pale cinnamon bases of secondaries in adult ♂, no concealed cinnamon in ♀ or immature. Marginal wing-coverts cinnamon, brighter in ♂♂. **Tail**. ♂: burnished copper to purplish-copper with narrow bronzy-green edgings. Immature ♂: typically bronzy basally becoming purplish distally (but one all-bronzy, one all-purplish), with outer rectrices distinctly tipped cinnamon. ♀: burnished copper with bronzy-green edgings (2 birds) to bronzy basally, purplish distally (2 birds). Immature ♀: coppery-purplish becoming bronzy basally, with outer rectrices distinctly tipped cinnamon.

Range. Interior Oaxaca in upper reaches of Rio Grande drainage (specimens from 11 miles S of Santiago Matatlán to Rancho Las Animas which is 2 miles W of Nejapa); also seen 16, 30, and 62 km by road SE of Las Animas in Dec 1991 (pers. obs.). Elevations of 600–1500 m. Nesting at least in Dec–Feb. Specimens examined: 15 ♂♂, 11 immature ♂♂, 4 ♀♀, 3 immature ♀♀; 1♂ intergrade between *rowleyi* and *wagneri* (CAS 71888). Culmen: 19 ♂ (21.1–23.9; 22.2); 4 ♀ (22.4–23.6; 22.7).

Etymology. Named for the late J. Stuart Rowley in recognition of his dedicated field studies in Mexico, in particular his work on hummingbirds in the state of Oaxaca.

Amazilia (viridifrons?) wagneri Phillips

Amazilia violiceps wagneri Phillips, 1964, Rev. Soc. Mex. Hist. Nat. 25: 222. 16°01′N, 97°04′30″W (approximately), Oaxaca.

Diagnosis. **Upperparts**. Crown blackish (often with oily blue-green sheen) in ♂, blackish-green in immature ♂, dark green in ♀ and immature ♀. Nape emerald green to bronzy-green, back bronzy-green, rump and upper tail-coverts bronzy, broadly edged cinnamon. **Underparts**. Flanks and axillars: in ♂, bright cinnamon to cinnamon-rufous, this colour extending up into auriculars and along lower edge of lores to bill; immature ♂, cinnamon overall paler and less extensive than ♂; ♀ paler than ♂ (bright vinaceous-cinnamon), less extensive in auriculars and loral region; immature ♀, cinnamon slightly brighter than ♀, and more extensive on neck and sides. Under tail-coverts usually with well-defined cinnamon spots on basal coverts and, less often, with pale cinnamon shaft streaks on distal coverts. Rarely (2 ♂♂) under tail-coverts clean white (AMNH 815302 from 19 mi. N Puerto Escondido, and LSU 24352 from 18 mi. SE Matatlán). **Wings**. Rufous to dull rufous on both webs of secondaries and on outer webs of inner primaries forms distinct wing panel in ♂; wing panel duller cinnamon and restricted to secondary bases in immature ♂; rufous restricted to tertial tips and inner webs of secondaries (mostly concealed) in ♀, but rarely (1 ♀) extending as dull panel on to inner primaries; dull cinnamon on secondaries concealed in immature ♀. Marginal wing-coverts cinnamon-rufous to cinnamon. **Tail**. ♂: rufous-chestnut, edged bronzy-green. Immature ♂: central rectrices purplish-copper, edged bronzy-green, outer rectrices chestnut-rufous, narrowly edged bronzy-green and tipped cinnamon (tips worn). ♀: central rectrices bronzy to bronzy-gold (purplish-copper in 1 ♀), outer rectrices rufous, narrowly edged bronzy. Immature ♀: central rectrices bronzy, outer rectrices rufous, edged bronzy-green and distinctly tipped cinnamon.

Range. Southern Oaxaca, from Pacific slope foothills of the Sierra de Miahuatlán W to the Isthmus of Tehuantepec (E to 12 miles NE of Juchitán), thence to upper Rio Grande drainage (W to 18 miles S of Santiago Matatlán), at elevations of 250–900 m. Nesting at least in Jan–Feb, May, and Aug–Oct. Specimens examined: 13 ♂♂, 1 immature ♂, 9 ♀♀, 1 immature ♀; 1 sex "?" (♀?) intergrade between *wagneri* and *rowleyi* (LSU 24353). Culmen: 14 ♂ (20.1–23.0; 21.3); 9 ♀ (20.5–23.7; 21.7).

Remarks. One specimen (LSU 27433) is labelled ♀ but has the tail pattern and bright wing panel typical of a ♂; this bird may be mislabelled.

Discussion

The distribution of Green-fronted Hummingbirds in southern Mexico presents an interesting problem. Hubbard (1974) discussed the mechanisms of glacial fragmentation and differentiation in the Pleistocene Epoch for several species groups in the arid lands of the southwestern United States and Mexico. I hypothesize that similar mechanisms have caused the present distribution of Green-fronted Hummingbirds in southern Mexico.

The similarity of western and eastern populations of Green-fronted Hummingbird suggests that the ancestor of the species had, at one time, a continuous distribution. Glacial advance may have forced this form into disjunct refugia in the interiors of Guerrero and Chiapas, at the same time isolating on the Pacific slope of Oaxaca a population that became *wagneri*. Glacial retreat then allowed the populations to expand and secondary contact between *wagneri* and *viridifrons* formed a hybrid swarm that led to the subspecies *rowleyi*. A second glacial advance again pushed back *viridifrons* to Guerrero and Chiapas and *wagneri* to the Pacific slope, but allowed *rowleyi* to remain in the upper Río Grande drainage. The situation one sees today reflects a further glacial retreat by which *wagneri* and *rowleyi* have come into secondary contact and *viridifrons* has connected with *rowleyi* through the interior of Oaxaca.

The apparent hiatus in the range of Green-fronted Hummingbirds between western Oaxaca (km 136 on the Puerto Escondido road) and the upper Rio Grande drainage is an artifact of incomplete collecting. The one specimen labelled from this area was collected by Mario del Toro Avilés, purportedly at San Pablo Valle de Mitla, but Binford (1989) has shown that Avilés' specimens are notoriously unreliable and has cast doubt on the specimen's data. While Green-fronted Hummingbirds appear to be uncommon in Oaxaca between the ranges of western *viridifrons* and *rowleyi*, there are several records. On 9 January 1987, S. Webb and I found a Green-fronted Hummingbird feeding a recently fledged juvenile at km 82 (i.e. 82 km S of Oaxaca City) on Highway 175 (the Puerto Angel road); and I saw one bird (probably an immature) on 20 December 1991 at km 20 on that same road. At the reservoir 2 km north of Teotitlán del Valle (about 20 km E of Oaxaca City) I have seen single birds (at least two individuals in total) in December of 1989, 1990 and 1991. All of these birds were studied carefully and had a distinct vinaceous to vinaceous-cinnamon wash on their flanks, although apparently less pronounced than on *rowleyi*. Without in-hand examination, however, it was impossible to determine if these birds were *rowleyi* or, as might be expected on geographic grounds, intergrades between *viridifrons* and *rowleyi*.

The more strongly vinaceous-cinnamon flanks and axillars of some birds from km 136 on the Puerto Escondido road probably indicate intergradation between *viridifrons* and *rowleyi*. This cinnamon colour has been suggested (on specimen labels) to indicate intergradation between *viridifrons* and *wagneri* from the southwestern part of the Pacific slope. The cinnamon colour is typical, however, of *rowleyi*, and the brightest km 136 birds show no other *wagneri* characters. Further, while suitable Green-fronted Hummingbird habitat is continuous from km 136 through the valley of Oaxaca to the range of *rowleyi*, the cloud forest and pine-oak forest of the Sierra de Miahuatlán separate suitable *viridifrons* habitat in the interior from *wagneri* habitat on the Pacific slope.

True *wagneri* may be specifically distinct from *A. viridifrons*. It is a very well-marked form when all characters are considered, in particular wing pattern and tail pattern in combination with the striking cinnamon sides which (unlike *viridifrons* and *rowleyi*) may be brighter in adult ♂♂ than immature ♂♂.

In eastern Oaxaca, *wagneri* and *A. v. viridifrons* appear to be sympatric: both were collected 12 miles NE of Juchitán in July 1957. In the upper Río Grande drainage, *wagneri* and *rowleyi* are sympatric: LSU 24352 (*wagneri*) from 18 miles SE of Matatlán lies amid 1 WFVZ specimen of *rowleyi* 11 miles S of Matatlán, 7 WFVZ *rowleyi* from 13 miles S of Matatlán, 1 WFVZ *rowleyi* from 20 miles S of Matatlán, and 21 MLZ *rowleyi* from Rancho las Animas (about 23 miles SE of Matatlán); 94.6% of specimens from this area are clearly one form or the other. *A. v. viridifrons* does not occur in the upper Río Grande drainage.

Only two specimens, both from the upper Río Grande drainage, appear to be intergrades. CAS 71888, a ♂ from Nejapa, differs from *rowleyi* in the cinnamon of the flanks and axillars being brighter than typical and extending up as small spots and flecks into the lower auriculars and to the base of the bill. LSU 24353 (labelled *wagneri*), of unknown sex (but probably a ♀ by plumage), from 18 miles S of Santiago Matatlán, differs from typical *wagneri* in the dull and reduced cinnamon secondary bases, and in the bronzy-green of the outer rectrices extending on to the inner webs, leaving only a small rufous wedge at the tip of the outer webs.

Finally, specimens of *wagneri* from the Sierra de Miahuatlán and *A. v. viridifrons* 40 km to the north in interior Oaxaca show no unequivocal signs of intergradation (see above).

Further studies should be concentrated at each extreme of the range of *wagneri* to determine the degree of sympatry and interbreeding (if any) with other Green-fronted Hummingbirds. If *wagneri* is considered specifically distinct I suggest the English name Cinnamon-sided Hummingbird.

Summary

An analysis of the *Amazilia viridifrons* complex reveals that one form may warrant specific recognition as *A. wagneri*, Cinnamon-sided Hummingbird. In addition, I describe a distinct subspecies of *A. v. viridifrons* from central Oaxaca. Disjunct western and eastern populations of *viridifrons* appear sufficiently similar that separate subspecific recognition for them is not warranted. Prior to this study, sex and age variation were

poorly understood in *A. viridifrons* and probably obscured taxonomic recognition of the forms involved.

Acknowledgements

In the course of this study I learned that J. Stuart Rowley and Jack von Bloeker of the Western Foundation of Vertebrate Zoology had been working on the problem of *Amazilia viridifrons* and had recognized the subspecific distinctness of the birds I describe here as *rowleyi* (L. F. Kiff pers. comm.). Were it not for the untimely death of Rowley in 1968 (von Bloeker died in 1991), an understanding of the variation in *Amazilia viridifrons* would no doubt have appeared sooner.

I thank the curators and collection managers who allowed me to borrow or examine specimens in their care: Stephen F. Bailey (California Academy of Sciences; CAS); Lloyd F. Kiff (Western Foundation of Vertebrate Zoology; WFVZ); John C. Hafner (Moore Laboratory of Zoology, Occidental College); Steven W. Cardiff (Louisiana State University; LSU); Richard L. Zusi (United States National Museum); Mary LeCroy (American Museum of Natural History; AMNH); Robert B. Payne (University of Michigan); and Ned K. Johnson (Museum of Vertebrate Zoology, University of California, Berkeley). I further thank Stephen F. Bailey and Betsey Cutler for logistical help during my work at CAS. Hector Gomez de Silva helped with field work in December 1991 and January 1992. Laurence C. Binford kindly shared with me his museum notes and provided thorough and helpful criticisms of the manuscript. Patrice Daley helped with preparation of the figure. This is contribution number 557 of the Point Reyes Bird Observatory.

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Address: Point Reyes Bird Observatory, 4990 Shoreline Highway, Stinson Beach, California 94970, U.S.A.

IN BRIEF

A RECENT RECORD OF THE MADAGASCAR POCHARD *AYTHYA INNOTATA* ON LAKE ALAOTRA, MADAGASCAR

Langrand (1990) considered the endemic Madagascar Pochard *Aythya innotata* one of Madagascar's "rarest and most threatened bird species", and it has been classified in the Red Data Book as endangered (Collar & Stuart 1985). This species' known distribution is mostly confined to the Lake Alaotra region, northeastern Madagascar (Langrand 1990), where in 1930 it was relatively common (Delacour 1932). Since that time the population of Madagascar Pochards has drastically declined. The most recent published record of it on Lake Alaotra is from 1960 (Payne, in Dee 1986); the only later observation was made in March 1970 on Lake Ambohibao near Antananarivo (Salvan 1970). Ornithological expeditions were undertaken to Lake Alaotra in 1971 (Forbes-Watson, in Dee 1986), December 1982. (Wilmé unpublished), September 1985 (Thompson *et al.* 1987), 1987 (Wilmé unpublished), October-November 1989 (Young & Smith 1989, 1990), and September-November 1989 and January-February 1990 (Wilmé in prep.), some designed specifically to search for the Madagascar Pochard, but it was not seen. The possible reasons for its decline on Lake Alaotra have been discussed by Young & Smith (1989) and Wilmé (in prep.).

Given that more than 20 years have passed since the last confirmed record of the Madagascar Pochard on Lake Alaotra, even after intensive ornithological surveys of the region, it was most astonishing that one was captured alive on the lake by some fowlers in August 1991. The bird, a male in adult plumage, was netted on 29 August 1991 along the western-central edge of Lake Alaotra, near the village of Anororo (17°30′S, 48°26′E), in a region known locally as "Mahakary". Measurements (in mm) of the live bird include: exposed culmen 46.5, tarsus 57.5; weight 685 g. In July 1992 the primaries, secondaries and tail were in complete moult.

The fowlers responsible for the bird's capture have many years' experience trapping ducks on Lake Alaotra, and regularly catch up to sixty birds per week with mist-nets placed in or near rice fields. After the Madagascar Pochard was caught, it was shown to other active fowlers and fishermen in the immediate vicinity of Anororo, and no one was familiar with the species. The local fowlers were acquainted with a public education programme about the Madagascar Pochard initiated in 1989 by me in the Lake Alaotra area (Wilmé in prep.), and thus they understood the importance of their find. The duck was transferred to Antananarivo on 30 September 1991, where it is currently held in an aviary.

The finding of a single Madagascar Pochard on Lake Alaotra indicates that a remnant population may still exist. Whether this species is an extremely rare permanent resident on the lake or breeds elsewhere and is a seasonal migrant to the area is unknown. An intensive survey is needed of the remaining lakes and natural wetlands of the island to determine the status of the Madagascar Pochard and other threatened wetland fauna. The results of this survey can then be used to recommend which wetlands should be given some protection by the Malagasy authorities in the context of the Ramsar Convention (Koester 1989) (still to be ratified in Madagascar). Currently there is no freshwater wetland protected in Madagascar (Nicoll & Langrand 1989).

I would especially like to thank Mr Steve Goodman who provided assistance and advice since the capture of the Pochard, as well as Dr Sheila O'Connor and Mr Olivier Langrand from World Wide Fund for Nature (WWF) Aires Protégées, Madagascar.

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Missouri Botanical Garden, LUCIENNE WILMÉ
B.P. 3391, Antananarivo (101),
Madagascar. 15 July 1992

THE AUTHORSHIP OF THE NAME OF THE BRITISH RACE OF THE CHAFFINCH

In *Falco* 5, 1909, p. 13, Pastor Otto Kleinschmidt described an intersexual variant of the Chaffinch from western Europe (Germany and the British Isles) under the trinomen *Fringilla caelebs gengleri*, form. nov., designating as its type an adult ♂ from Hampstead, London, dated 22 June 1869 (*ex* Bowdler Sharpe collection). In 1933 the Dutch workers P. A. Hens & J. G. van Marle showed that the Chaffinches of the British Isles warranted recognition subspecifically on the browner, less vinaceous, red colour of the ear-coverts and underside in breeding males, adopting for them Kleinschmidt's name of 1909. Later, Witherby, *Handbook of British Birds*, vol. 1, 1938, pp. 104–107, Vaurie, *Birds of the Palearctic Fauna*, Passeriformes, 1959, p. 595, and other senior authors adopted Hens and van Marle's proposal and recognised the British birds as discrete from those of the continent under the name *F. c. gengleri* Kleinschmidt, overlooking the fact that the said name of 1909 is an infrasubspecific epithet, and as such is not available in nomenclature.

Article 50 (c) (i) of the *International Code of Zoological Nomenclature*, 3rd edition, 1985, specifies that "if an infrasubspecific name [proposed prior to 1961] that otherwise satisfies the criteria of availability is used for a species or subspecies, the author is the one who first so uses it". Consequently, the trinomen *F. c. gengleri* is to be attributed to Hens & van Marle, who elevated Kleinschmidt's form. nov. to that of a subspecies in *Organ der Club van Nederlandsche Vogelkundigen*, 6, No. 2, 1933, pp. 49–58, the type-locality Hampstead, London, England. Apart from the indigenous British Isles populations, *F. c. gengleri* has been introduced to the southwestern Cape Province of South Africa and the islands of New Zealand. The type of the subspecies dealt with here is in the Museum Alexander Koenig, Bonn, and is No. 399 in the Kleinschmidt collection housed in that centre.

I am grateful to Dr Renate van den Elzen of the Museum Alexander Koenig for her ready help in this enquiry.

Durban Natural Science Museum,
P.O. Box 4085,
Durban 4001,
South Africa.

P. A. CLANCEY

30 September 1992

A NEW NAME FOR *MYRMECIZA IMMACULATA BERLEPSCHI* (FORMICARIIDAE)

With the transfer of *Pyriglena* (later *Sipia*) *berlepschi* Hartert, 1898, to the genus *Myrmeciza* (see Robbins & Ridgely 1991, *Bull. Brit. Orn. Cl.* 111: 11–18), the name *Myrmeciza berlepschi* Ridgway, 1909 (now used for a valid subspecies of *M. immaculata*) becomes preoccupied. We therefore rename the latter form as follows:

Myrmeciza immaculata macrorhyncha, nom. nov. for *Myrmeciza berlepschi* Ridgway, *Proc. Biol. Soc. Washington* 22 (1909): 74, preoccupied in *Myrmeciza* by *Pyriglena berlepschi* Hartert, *Bull. Brit. Orn. Cl.* 7 (1898): xxix. We chose the name *macrorhyncha*, as the large bill is one of the prominent characters that distinguishes trans- from cis-Andean birds.

We thank Niels Krabbe for pointing out this nomenclatural problem, and, once again, we are indebted to Kenneth Parkes for his inestimable advice on nomenclatural protocol.

Dept. of Ornithology, Academy of Natural Sciences,
1900 Benjamin Franklin Parkway,
Philadelphia, Pennsylvania 19103,
U.S.A.

MARK B. ROBBINS
ROBERT S. RIDGELY

14 October 1992

VALIDATION OF SOME NEWLY PROPOSED NAMES FOR FRANCOLINS (PHASIANIDAE)

In a recently published revision of the phasianid genus *Francolinus* and some relatives (*Auk* 109: 24–42) four new subgeneric names were introduced on p. 37, with characters purporting to differentiate the taxa. Unfortunately, type species for these subgenera were not nominated and the opportunity is now taken to do so.

Within the genus *Francolinus* Stephens, 1811, as now understood, three subgenera were recognized, of which one, *Limnocolinus*, is new. The type species is *Perdix gularis* Temminck, 1815 by monotypy.

Within the genus *Pternistis* Wagler, 1832, as now understood, seven subgenera were recognized of which three are new. The first is *Notocolinus* for which I now designate as type species *Tetrao capensis* Gmelin, 1789, the constituent species with the most southerly range. The second is *Squamatocolinus* for which I now designate as type species *Francolinus squamatus* Cassin, 1857, by virtual tautonomy. The third is *Oreocolinus* for which I now designate as type species *Francolinus nobilis* Reichenow, 1908.

FitzPatrick Institute, University of Cape Town, Rondebosch 7700, South Africa. T. M. CROWE

10 November 1992

BREEDING OF THE LAVENDER FIREFINCH

The shy and secretive nature of the nesting Lavender Firefinch *Estrilda caerulescens* in Senegal, remarked upon by Dr Baillon (*Bull. Brit. Orn. Cl.* 112 (1992): 274–275), does not seem to be the experience in The Gambia. Gore (1990, *Birds of the Gambia*, B.O.U. Checklist, revised ed.) describes *Estrilda caerulescens* as a "not uncommon resident" found throughout The Gambia; breeding recorded from August to October.

In the Lower River region of The Gambia the Lavender Firefinch is a common garden bird, often occurring in small flocks, as Dr Baillon notes, with other estrildines. There are many records of nest-building there in August and September (T. V. Sims, S. Tulloch and R. Parsons, pers. comm.), particularly in citrus trees; and the nest, but not the eggs, has been described from observations made in the compound of the Medical Research Council at Fajara, 13°40′N 16°50′W (Moore 1983, *Malimbus* 5: 56). Birds nesting in this well-frequented area were not easily disturbed; one nest was built within 2 m, and in full sight of, an open window.

Further observations made in 1983 showed that a variety of materials was used for nest-building. The main part of the globe built of seeding grasses took three days to complete. Lining with longer, more lax, grasses followed; one bird carrying the material to the nest entrance where the second bird could be seen to receive it. Other materials carried to the nest at this stage included *Asparagus plumosus* and branchlets of *Casuarina equisetifolia*. By the end of each rainy season the nests had become dilapidated but were often occupied, as were discarded nests of other species, by roosting *E. caerulescens*. By October 1983 parties of adults and juveniles had been identified in the compound. The usual number in the groups was 5, 2 adults and 3 juveniles, which might suggest that the clutch number is indeed 3.

1 Uppingham Road,
Oakham,
Rutland LE15 6JB, U.K.

AMBERLEY MOORE

23, January 1993

BOOKS RECEIVED

Beavers, R. A. 1992. *The Birds of Tikal*. Pp. x+153, 3 maps, 16 black-and-white photographs. Texas A&M University Press. ISBN 0-89096-525-0 (cloth), 0-89096-518-8 (paper). No price given; obtainable from Texas A&M University Press, College Station, Texas 77843-4354. 16.5 × 10 cm.

A well-documented annotated checklist, suitable for the pocket, covering not only the Tikal National Park but also the whole of the Department of Petén, Guatemala, in which Tikal is situated. The data are presented in tabulated form, with status shown by quarter-month periods (thus useful as indicating the times when migrant species are present), supplemented by three appendices and a more fully annotated list of the species not treated in Smithe's (1966) *Birds of Tikal*.

Erskine, A. J. 1992. *Atlas of Breeding Birds of the Maritime Provinces*. Pp. x+270, maps, tables. Nimbus Publishing Ltd. (P.O. Box 9301, Station A, Halifax, Nova Scotia, Canada B3K 5N5). ISBN 1-55109-010-4. $(Cdn) 29.95. 27 × 20 cm.

Covering Nova Scotia, New Brunswick and Prince Edward Island, this is the first Canadian breeding bird atlas based on the 10 × 10 km grid-square mapping scale used for many European atlases. For each species there is also a small inset map on a 20 × 20 km grid, allowing a clearer picture of overall distribution. There are overlays showing land use, main forest types, distribution of human population etc., and several chapters of analysis and discussion follow the main systematic section.

Mackinnon, J. & Phillipps, K. 1993. *A Field Guide to the Birds of Borneo, Sumatra, Java and Bali*. Pp. xvi+491, 88 colour plates. Oxford University Press. ISBN 0-19-854034-5. £25.00 (paperback; also available in hardback). 20 × 14 cm.

Covering the Greater Sunda Islands, biologically one of the richest areas in the world, this is a logical new addition to the now nearly complete coverage of the world by comprehensive, well-illustrated field guides. After the usual introductory sections, the main part of the book covers the 820 species known from the area. The 88 colour plates, by Karen Phillipps, are small but well drawn, faithfully coloured and clear, and should be adequate for identification except perhaps for some very difficult species. There are 48 pages of appendices, and a 10-page bibliography.

Roberts, T. J. 1992. *The Birds of Pakistan*. Vol. 2 Passerines. Pp. xxxv+617. 24 colour plates, drawings and maps. ISBN 0-19-577405-1 (hardback). £40.00. 26 × 21 cm.

For a review of the first volume of this excellent work, see *Bull. Brit. Orn. Cl.* 111(1991): 176. Little more needs to be said about the passerine volume, which completes the work, as it follows the same plan and maintains the high standard of the non-passerine volume. For European ornithologists, there is a special interest in the fact that a number of west Palaearctic species reach their southeastern breeding limits in northern or western Pakistan, and that for other species it is an important wintering area.

NOTICE TO CONTRIBUTORS

Papers, from Club Members or non-members, should be sent to the Editor, Dr D. W. Snow, The Old Forge, Wingrave, Aylesbury, Bucks HP22 4PD, U.K., and must be offered solely to the *Bulletin*. They should be typed on one side of the paper, with **treble**-spacing and a wide margin, and submitted in duplicate. The style and lay-out should conform with usage in this or recent issues of the *Bulletin*.

A contributor is entitled to 10 free offprints of the pages of the *Bulletin* in which his contribution, if one page or more in length, appears. Additional offprints or offprints of contributions of less than one page may be ordered when the manuscript is submitted and will be charged for. Authors may be charged for proof corrections for which they are responsible.

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Indices: Vol. 70 and after £1.50 each; Vols. 50–69 £2.50 each; Vol. 49 and before £6 each.

Long runs (10 years or more) for Vol. 50 and after are available at reduced rates on enquiry. Postage and packing extra. Orders over £50 post free. Special issue Vol. 112A, 1992, in hardback, 300p, £32, inc. p&p.

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CORRESPONDENCE

Correspondence about Club Meetings and on all other matters should go to the Hon. Secretary, Mrs A. M. Moore, 1 Uppingham Road, Oakham, Rutland LE15 6JB, U.K.

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Bulletin of the

British Ornithologists' Club

Edited by
Dr D. W. SNOW

Volume 113 No. 4 December 1993

FORTHCOMING MEETINGS

Tuesday, 18 January 1994. Mr John Burton will show a programme of films of ornithological interest which he has retrieved from the National Film Archive. John Burton was commissioned in 1989 to undertake a feasibility study for establishing an *Environmental Record Archive* in the course of which some of the earliest wildlife films were viewed. His compilation includes film of St Kilda in the 1900s and Great Bustards in Hungary in the 1930s. He was formerly the Executive Secretary of the Flora and Fauna Preservation Society.

*Those wishing to attend are asked to notify the Hon. Secretary by Tuesday, 4 January 1994**.

Tuesday, 22 February 1994. Mr Martin Woodcock will speak on "3 Tropical Forests"—a montane and a lowland forest in East Africa and a montane forest in West Africa. Martin Woodcock has contributed text and illustrations to a number of important ornithological publications since 1975 and his work has been selected for exhibition in several countries. He was Honorary Secretary of the Club for 1965–1969.

*Those wishing to attend are asked to notify the Hon. Secretary by Tuesday, 8 February 1994**.

It is hoped to arrange a second Club visit in April 1994 to Tring Museum for those members who were unable to join the visit in June this year. Please see the enclosed leaflet for details.

Tuesday, 19 April 1994. John Wyatt J.P. will speak on "Birds of Eastern Poland". John Wyatt is a naturalist, writer and photographer. He leads wildlife tours in Europe and Africa and has a particular interest in Poland. He was formerly a Deputy Director of Development of the British Trust for Ornithology.

*Those wishing to attend are asked to notify the Hon. Secretary by Tuesday, 5 April 1994**.

Tuesday, 24 May 1994. Annual General Meeting at 6 p.m. followed by the evening meeting when **Dr Peter Lack will speak on "Birds and Farming".**

Tuesday, 19 July 1994. Mr Richard French will speak on "Sounds of Birds in the Neotropics".

Meetings are held in the Sherfield Building of Imperial College, South Kensington, London at 6.15 p.m. for 7 p.m. A map showing Imperial College will be sent to members on request.

*Late acceptances and cancellations can usually be taken up to the Thursday morning preceding a meeting, although members are asked to accept by 14 days beforehand as arrangements for meetings have to be confirmed with Imperial College well in advance.

If you accept and subsequently find you are unable to attend please notify the Hon. Secretary, 1 Uppingham Road, Oakham, Rutland LE15 6JB (tel. 0572 722788) as soon as possible as the booking can often be offered to another member.

Bulletin of the BRITISH ORNITHOLOGISTS' CLUB

Vol. 113 No. 4 Published 30 December 1993

The eight hundred and thirtieth meeting of the Club was held on 30 June 1993 at the Sub-department of Ornithology of the Natural History Museum, at Tring. 14 Members and 7 Guests attended.

Members attending were: D. Griffin (*Chairman*), M. A. Adcock, Miss H. Baker, Dr R. A. Cheke, A. Gibbs, Rev. T. W. Gladwin, F. P. Littlemore, Dr J. F. Monk, D. J. Montier, Mrs A. M. Moore, R. G. Morgan, R. E. F. Peal, Dr R. Self, N. H. F. Stone.

Guests attending were: Mrs B. Adcock, Mrs J. Gladwin, Mrs B. Gibbs, Ms K. Hoff, Mrs D. Monk, Mrs M. Montier, P. J. Moore.

After a welcome and introduction to the Tring Museum by Mr Iain Bishop, Deputy Keeper of Zoology and Curator of the Walter Rothschild Zoological Museum, Dr Robert Prys-Jones described the work of the Bird Group of the Natural History Museum, all of whom are based at Tring. The visitors were then split into four groups to view, in turn, the library, the egg collection, the skin collection and the anatomical collection. Between tours an excellent buffet lunch was enjoyed.

The Librarian, Mrs Effie Warr, had selected for display a wealth of fascinating ornithological books, which could only be handled after donning special gloves. In addition to the sight of rare volumes with exquisite plates, the general collection and journal holdings were also viewed. Particular attention had been paid to providing glimpses of items of special interest to members, including, for instance, the manuscript of an unpublished autobiography by David Bannerman.

The egg collections were shown by Michael Walters. The extensive holdings, sadly depleted by a felonious visitor in the recent past, include eggs of extinct birds (e.g. Great Auk *Alca (Pinguinis) impennis*, examples of candidate species only known from their eggs such as Stair's Megapode *Megapodius stairi* and Burnaby's Megapode *M. burnabyi*, rare cluthes (e.g. Curlew Sandpiper *Calidris ferruginea*, and artificial eggs for duping collectors to part with their money. Other delights included examples of Cuckoo *Cuculus canorus* eggs, with each variant together with the host's clutch, and the clutch of the Emperor Penguin *Aptenodytes forsteri* collected by the Antarctic explorer Cherry-Garrard.

Peter Colston introduced the skin collection, which comprises more than 1 000 000 specimens, and explained the cataloguing, labelling and treatment of the 8000 types. Of topical interest, he explained with relevant skins how the validity of the recently described warblers *Phylloscopus sichuanensis* and *P. hainanus* relied, amongst other criteria, on comparisons with the Museum's holdings of related *Phylloscopus* species. Specimens of historical interest, such as collections from Darwin's H.M.S. *Beagle* expedition and specimens used by Audubon for his paintings, provided further fascination.

The extensive anatomical collections of skeletons and specimens in spirit were described by Miss Jo Bailey. The spirit collections abounded with birds collected by past and present members of the Club. Of great interest was Miss Bailey's demonstration of how dead birds are stripped to leave only the bare bones. The hard work is delegated to beetles (*Dermestes maculatus*) which are carefully nurtured in purpose-built surroundings well away from the main skin collections.

Thanks are due to Mr Bishop, Dr Prys-Jones, Mr Colston, Mr Walters, Miss Bailey and Mrs Warr for a fascinating and rewarding day, providing a vivid behind-the-scenes view to supplement the recent description of the Museum's work given by Knox and Walters in *Bull. B.O.C.* 112A: 169–190.

The eight hundred and thirty-first meeting of the Club was held on Tuesday, 27 July 1993 in the Ante-room of the Sherfield Building, Imperial College, South Kensington at 6.15 pm. 24 Members and 13 Guests attended. The speaker, Professor C. W. T. Pilcher, was a Guest of the Club.

Members attending were: D. Griffin (*Chairman*), M. A. Adcock, B. H. Beck, Mrs D. Bradley, D. R. Calder, Cdr. M. B. Casement, RN Retd, Professor R. Chandler, P. J. Conder, S. J. Farnsworth, Rev. T. W. Gladwin, C. A. R. Helm, S. Howe, M. C. Jennings, I. T. Lewis, N. S. Malcolm, Dr J. F. Monk, D. J. Montier, Mrs A. M. Moore, Mrs M. Muller, R. E. F. Peal, Dr R. C. Self, N. H. F. Stone, Professor W.E. Waters, Mrs F. E. Warr.

Guest attending were: Professor Charles Pilcher (*Speaker*), Mrs B. Adcock, Miss S. Adcock, J. N. B. Brown, Mrs C. Carnally, J. Carnally, Mrs F. Farnsworth, Dr D. Foskett, Mrs J. Gladwin, Ms K. Hoff, Mrs S. L. Lewis, Mrs M. Montier, P. J. Moore, J. Warr.

After supper Professor Pilcher spoke on the avifauna of Kuwait. It includes a high percentage of Asian and African migrants, due to the geographical accident of Kuwait's postion on the Balkan/Pakistan and Asian/African migratory routes. He demonstrated some of the effects of the heavy pollution caused by the Gulf War in Kuwait Bay and at two inland freshwater sites. The increase in rainfall since the war has resulted in some regeneration of the region and earlier conservation programmes have been renewed.

The eight hundred and thirty-second meeting of the Club was held on Tuesday, 21 September 1993 in the Rector's House, Imperial College, South Kensington at 6.15 pm. 24 Members and 12 Guests attended.

Members attending were: D. Griffin (*Chairman*), Dr G. W. H. Davison (*Speaker*), M. A. Adcock, Mrs D. M. Bradley, D. R. Calder, Dr R. A. Cheke, S. J. Farnsworth, A. Gibbs, Rev. T. W. Gladwin, C. A. R. Helm, K. W. Henshall, R. H. Kettle, Dr R. Liversidge, Dr C. F. Mann, Dr J. F. Monk, Mrs A. M. Moore, R. G. Morgan, Mrs M. Muller, P. J. Oliver, J. G. Parker, N. Redman, R. E. Scott, Dr R. Self, N. H. F. Stone.

Guests attending were: Mrs B. Adcock, I. R. Bishop, Mrs G. Bonham, Mrs J. Calder, Mrs F. Farnsworth, Mrs J. Gladwin, Miss J. Gough, Ms K. Hoff, Mrs V. Liversidge, Dr H. Liversidge, Mrs D. Monk, P. J. Moore.

The speaker was Dr Geoffrey Davison, who gave a most interesting account of his work on the pheasants of the Malaysian rainforest, illustrated with slides and with imitations of calls of the birds. He began by illustrating several of the species of Argus and Peacock-pheasants to be found there, and suggested that the smaller, duller species are the most biologically interesting.

The Great Argus is an extremely large pheasant, nearly always solitary, in which most fully adult-plumaged males each maintain one cleaned display area during the breeding season. Females (possibly territorial) are attracted to arenas by the males' loud calls, but the distances between solitary males make it unlikely that visual comparisons are made. Males on hill tops, whose calls carry farther, may be able to attract more mates. The display is prolonged and vigorous, and the chief means of competition between males may be for access to sites which can be cleared for uninhibited display.

The Malaysian Peacock-pheasant has many features uncommon or unique amongst pheasants, chief amongst them a one-egg clutch. This is part of a syndrome of longevity, intensive care of the young, and possibly deferred maturity.

Combining features from the high productivity characteristic of most Galliformes together with the intensive chick care characteristic of Peacock-pheasants, the Crested Wood-partridge has more diverse and elaborate chick care than any other species, but splits the brood between male and female parents. Together, the various pheasant and partridge species illustrate a range of solutions to reproduction within a hostile environment.

Cobb's Wren on beach boulder, Kidney Island, Falkland Islands, November 1960 (photograph: R. W. Woods)

Cobb's Wren *Troglodytes (aedon) cobbi* of the Falkland Islands

by R. W. Woods

Received 2 November 1992

The single Falkland Islands species in the genus *Troglodytes* was described at the 153rd meeting of the British Ornithologists' Club on 20 October 1909. Mr Charles Chubb communicated, through Dr R. Bowdler Sharpe, a description "of a new species of Wren from the Falkland Islands, where it had been discovered by Mr A. F. Cobb". Chubb (1909) named this wren *Troglodytes cobbi*, and his description reads as follows:

TROGLODYTES COBBI, sp. n.

Similis *T. hornensi*, sed valde major: supra cinerascenti-brunneus, gutture et pectore toto cinerascenti-isabellinis. Long. tot. c.5.4 poll., culm. 0.85, alae 2.8, caudae 1.75, tarsi 0.75. *Obs*. In *T. hornensis*, Less., the bill is only 0.6 inch and the tarsus 0.7, so that *T. cobbi* seems to be a large insular form.

There are no further comments on the species in this issue of the *Bulletin*, and Cobb did not include this wren in either of his two short books on Falklands wildlife and birds (1910, 1933).

Since its discovery, Cobb's Wren has been treated as a species only by Chapman & Griscom (1924), Bennett (1926), Chapman (1934) and Bennett (1935). In discussing its affinities, Chapman & Griscom used specimens collected in 1915–16 by R. H. Beck. They concluded that it was obviously a representative house wren but was sharply distinct from continental races because it was almost as dark below as above, was noticeably large, and occupied an insular habitat. They felt that it deserved specific rank, and Chapman (1934) reiterated this opinion when he stated that *T. cobbi* was "A specifically distinct representative of the continental *Troglodytes musculus*". Hellmayr (1921), however, although he had not seen any skins of Cobb's Wren, treated it as a subspecies of the mainland *T. musculus* (later usually merged with North American *T. aedon*), and this has been accepted by most later authors. Later, after examining the AMNH skins of Cobb's Wren, Hellmayr (1934) stated that they were nearest in colour to *T. m. bonariae* of eastern Argentina, Uruguay and extreme southern Brazil, rather than the geographically nearest race in southern Argentina and Chile, *T. m. chilensis*, in which he included *T. m. magellanicus*. He noted that the "Falkland Wren" was very much larger with a much stronger, longer bill and had no buff postocular streak, yet he maintained his original classification of it as a race of *T. musculus*.

Dimensions of Cobb's Wren

The measurements of live-trapped Cobb's Wrens, presented in Table 1, were obtained during field work on Kidney Island (51°38′S,

TABLE 1
Measurements (mm) of Cobb's Wrens ringed on Kidney, Bleaker or George Islands between 21 November 1959 and 16 March 1963

	n	Range	Mean	s.d.
Wing	19	52–63	56.2	3.17
Bill	18	13–20	17.9	1.77
Tarsus	16	15.5–20	17.9	1.29
Tail	2	41–42	41.5	0.71
Body length	5	130–140	134	3
Weights (g)	7	17–20	19.1	1.02

Bill length was taken from the side with dividers pressed along the culmen to the skull.

57°44′W) 11 km (7 miles) northeast of Stanley, East Falkland, between November 1959 and March 1963, and from R. Reid (*in litt.*) who trapped, ringed and measured several specimens on George Island (52°21′S, 59°45′W) and Bleaker Island (52°12′S, 58°51′W) in 1961. Chapman & Griscom's (1924) measurements fall within the ranges shown in Table 1, except for their tail-lengths which have a range of 39–43 mm. Hellmayr (1934) gives similar dimensions for the same skins, though bill lengths are about 2 mm longer and closer to the mean of the 1959–63 sample. Chubb's (1909) measurements of the type, converted to mm, are all greater than the 1959–63 means; wing (71 mm), bill (21.6 mm) and tail (44.5 mm) fall outside the ranges shown in Table 1; tarsus and body length measurements fall within the range. The Chubb type specimen (1909. 10. 20. 37) and the three other Falkland skins at the Sub-Department of Ornithology, Tring, were measured in February 1991. All four specimens have very similar dimensions (wing 55–59 mm, tail 43.2–45.5 mm, bill 17–19 mm, tarsus 17–19 mm). Except for the tail, they fall within the ranges of the 1959–63 sample. It appears that measuring techniques used in 1909 differed from those used now or that there were errors in the figures given by Chubb.

Plumage aberrations

Cawkell & Hamilton (1961) recorded the first example, a cream-coloured bird seen several times on Kidney Island in 1951. On 16 March 1963, a partial albino Cobb's Wren was trapped and photographed on Kidney Island. This bird had symmetrical rectangular white flank patches and one white lesser wing-covert on the right wing. The underparts were paler than usual, with a creamy white throat, buffish breast and chestnut vent and undertail-coverts. A bird with similar pale flanks was seen 500 m away on the other side of Kidney Island in October 1962. Several birds showing variable white or grey markings near the eyes and on the crown were seen and photographed on Kidney Island between 1959 and 1962 on dates between 26 October and 3 January. Spread over this period of the breeding season, these markings seem unlikely to be head moult and no sequence over the head was found. No birds with unusual plumage colours were seen on Kidney Island in 1983, but one singing male on Carcass Island in 1983 was recognisable because it showed partial albinism in plumage and claws. The albinism was symmetrical in three white inner secondary feathers on each wing, separated by one normal feather, and there were several other white body and head feathers. These aberrations have probably arisen through mutation in the restricted gene pools, in the small isolated island populations of Carcass and Kidney which are 190 km (120 miles) apart. As mentioned later, there is no evidence of regular migration between offshore islands.

Distribution, habitats and nesting of the House Wren in the Americas

This summary is intended to provide a basis for comparison with the distributional and ecological data on Cobb's Wren given in the subsequent sections.

The House Wren is widespread in North and South America and migratory in the southern and northern parts of its range (Kendeigh 1941, Humphrey *et al*. 1970, Venegas & Jory 1979). Ridgely & Tudor (1989) describe it as a virtual commensal of man almost throughout South America. Crawshay (1907) remarks that it is one of the commonest birds in the outskirts of forests in Tierra del Fuego. The House Wren's adaptability was noted by Hudson (1920) and confirmed by Ridgely & Tudor who state that it occurs "in virtually all open or semiopen habitats." Although Crawshay did not find it in open grassland, Venegas & Jory (1979) observed it in many habitats throughout the Magellanic region, including treeless uplands to 1000 m. South of Tierra del Fuego, Reynolds (1935) observed House Wrens in stunted evergreen woodland on islands of the Wollaston group. Observers in the Americas agree that it will nest in any available hole of a suitable size, above or below ground level. Nests are untidy deep cups with a foundation of coarse sticks that almost fill the chosen site. The cup is lined with fine grasses and roots with an inner lining of soft materials (Hudson 1920, Haverschmidt 1952, Skutch 1953).

Historical records of Cobb's Wren

There are no definite records of Cobb's Wren in the early years of settlement before the species was described. Only Pernety at Port Louis in 1764 and Clayton on Saunders Island between 1773 and 1774, provide evidence of the presence of some kind of wren.

Pernety (1771) remarked on the "great numbers of wrens like those in France". Cobb's Wren resembles the European Wren *T. troglodytes* while the Grass (Short-billed Marsh) Wren *Cistothorus platensis* has generally lighter plumage, heavily striated buff and black above. Pernety's brief comment may be significant because he was describing part of East Falkland when the native vegetation was intact. Pernety and the other French settlers established Port Louis in 1764 and introduced the first herbivorous animals, including cattle, sheep, pigs and horses. These grazed and trampled the coastal tussac grass *Parodiochloa flabellata*, a gigantic and very long-lived plant that has evolved only in south Atlantic regions with few or no native herbivores (Wace 1960). Tussac cannot survive continuous grazing and is also very susceptible to fire (Bourne 1988, Woods 1988). Since the late 18th century, almost all tussac on East and West Falkland has disappeared but it survives on some smaller offshore islands where it has not been over-grazed or burnt. A recent study showed a 42% decrease in mature tussac on 22 continuously stocked islands between 1956 and 1983 (Woods, in Strange *et al*. 1988).

Clayton (1774) on Saunders Island noted "two kind of little birds whose plumage is light brown, one with a white throat and fond of coming in and about our houses like the Robins in England". His "little birds" may have been compared with the large, conspicuous sheldgeese *Chloephaga* spp. and therefore could apply to any passerines, though other brief descriptions refer to "finches" and a "thrush". Possible species for these "little birds" are the wrens and the Tussac-bird *Cinclodes antarcticus*. The Grass Wren does not frequent habitations. Cobb's Wren is predominantly brown above with buffish underparts, darker at the sides and whitish in the centre, and is fairly tame. The remarkably tame Tussac-bird is a dull dark brown. Though Clayton's descriptions are inadequate, he may have been referring to Cobb's Wren and the Tussac-bird.

None of the visiting naturalists in the 19th Century (Quoy and Gaimard in 1820, Garnot in 1822, Darwin in 1833 and 1834, Hooker and McCormick in 1842 and Abbott between 1858 and 1860) reported a wren that is recognisable as Cobb's Wren. This seems surprising because Cobb's Wren is tamer, has a louder song and is more easily seen where both species occur. However, Abbott apparently only travelled in East Falkland while Quoy and Gaimard, Garnot, Darwin and McCormick were all based for periods of one to six months in the Berkeley Sound/Port Louis area of East Falkland. Garnot and Abbott both noted the Grass Wren which still occurs in marshy areas with rushes on the main islands. Their failure to record Cobb's Wren was possibly associated with deterioration of habitat. When Quoy and Gaimard stayed for several months in 1820, most tussac had probably disappeared from the Port Louis area with consequent loss of habitat for all passerines. Some evidence comes from the botanist J. D. Hooker (1847), who visited Port Louis in 1842, nearly 80 years after the first settlement. He remarked that cattle ate the tussac straw used to roof a house in the settlement, estimated that about 30,000 feral cattle roamed the country, and commented that tussac had been greatly reduced by uncontrolled grazing. Perhaps none of these naturalists visited offshore tussac-covered islands, such as Kidney Island in the southern entrance of Berkeley Sound, where a strong population of Cobb's Wren still exists. There is no evidence that it occurred in coastal regions of East Falkland, but if it did, the widespread destruction of tussac may have contributed to its disappearance before 1820.

TABLE 2
Occurrence of Cobb's Wren and mammalian predators on 29 outer islands of the Falkland Islands

	Number of predator species 0	1	2	3
Cobb's Wren present	16	1	0	0
Cobb's Wren absent	0	3	7	2

Distribution and status of Cobb's Wren

Cobb's Wren is resident in the Falkland Islands and appears to be sedentary. Pettingill (1960) concluded that the prevailing strong westerly winds and equable climate would tend to inhibit migration, particularly of the land birds living in tussac. Winters are not so severe as to favour migration though the predominant westerly winds possibly aided colonisation in the past. Evidence of sedentary behaviour was obtained by ringing between 1959 and 1963. Of the 23 ringed, the five subsequent records, up to 11 months after ringing, were all of birds seen or retrapped on the island where ringed. Neither ringing nor the few records of post-breeding dispersal have suggested interchange between the isolated island colonies. There is, however, evidence of post-breeding dispersal from Carcass Island to nearby West Point Island, where R. B. Napier (*in litt.*) has seen a few individuals in autumn.

In 1983 a Breeding Birds Survey was started through the Falkland Islands Trust in Stanley, now Falklands Conservation (Woods 1989). By 1993, Cobb's Wren had been recorded as present or breeding on only 17 offshore islands and as absent from 12 islands (Fig. 1). The data are summarised in Table 2 in relation to the number of predator species. Domestic or feral cats *Felis catus* and Norway Rats *Rattus norvegicus* were recorded on seven islands, Black rats *Rattus rattus* on one island, House Mice *Mus musculus* and Patagonian Foxes *Dusicyon griseus* each on four islands. Cats or foxes were present on 10 of the 12 islands without Cobb's Wren and both were present on one of the 10, suggesting that introduced carnivores are potentially more damaging than the omnivorous rodents. It has, however, been reported as breeding on one island where there are a few domestic cats but no rats or mice.

Habitat

Beck (1917) found that Cobb's Wren was still common on Kidney Island but saw none around Stanley and he remarked that the destruction of tussac grass by sheep on all but outlying islets had driven "the wren" away from inhabited areas. Bennett (1926) and Cawkell & Hamilton (1961) implied that it occurred exclusively on tussac islands. Pettingill (1974) described it as a "common resident on certain tussock islands where it frequents the adjacent beaches, rocky slopes and cliffs". He was puzzled in 1953–54 and 1971–72 by the restricted distribution of

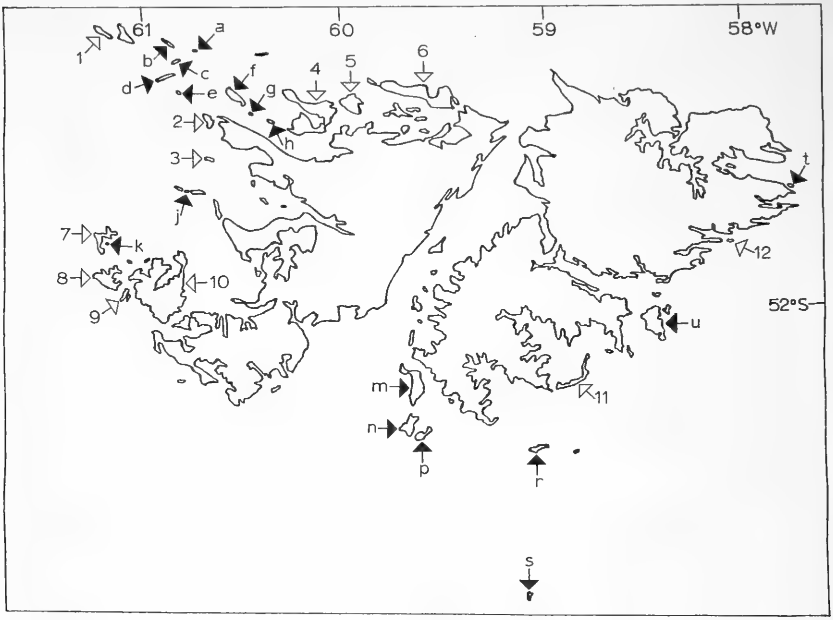

Figure 1. Islands where Cobb's Wren was present or absent during the Breeding Birds Survey of Falklands Conservation 1983–1993. *Cobb's Wren present:* a, North Fur; b, Flat Jason; c, Elephant Jason; d, South Jason; e, South Fur; f, Carcass; g, Low; h, Dunbar; j, Third Passage; k, Beef; m, Speedwell; n, George; p, Barren; r, Sea Lion; s, Beauchêne; t, Kidney; u, Lively. *Cobb's Wren absent:* 1, Steeple Jason; 2, West Point; 3, Split; 4, Saunders; 5, Keppel; 6, Pebble; 7, New; 8, Beaver; 9, Staats; 10, Weddell; 11, Bleaker; 12, East.

Cobb's Wren; his observations suggested that it required extensive and luxuriant tussac on small islands and he did not see it in any other kind of habitat. He had no knowledge of its occurrence in Stanley or at farm settlements, "despite the prevalence of tree and shrub plantations, many hedgerows [of gorse and native Box *Hebe elliptica*] and numerous cavities in sheds and dilapidated buildings". Evidence from the Breeding Birds Survey confirms that Cobb's Wren does not utilise the variety of habitats that are exploited by the House Wren in South America. The lack of substantiated records from the mainland of East or West Falkland suggests that it cannot survive where coastal tussac grass and shrubs such as Fachine *Chiliotrichum diffusum* have been destroyed and where feral cats, rats and mice are present. However, field work on Carcass Island showed that tussac grass is not an essential component of all territories.

Nest-sites and nests

Most of the few recorded nest-sites have been in basal parts of large tussac plants. Cawkell & Hamilton (1961) reported one nest hidden beneath large boulders on Kidney Island and a nest was found in a sheepskin hanging on a fence on George Island (Reid, in Woods 1975). There is no evidence that Cobb's Wren now nests in any shrubs or in sites such as stone walls or sheds. Five nests on Kidney Island and Carcass Island were built of dead tussac stems with substantial linings of soft feathers. Each nest filled a hollow, either between dead leaves near ground level or within a crack in the fibrous root pedestal. Two of three nests examined were domed, with an entrance hole near the top. Pettingill (1974) notes that the nest he found on Kidney Island was a ball of dead grasses in a hollow on the side of a pedestal, 90 cm above ground.

On Kidney Island in October 1962, a deep cup-shaped nest with four small chicks was found in a cavity at the side of a tussac root pedestal. The nest was about 60 cm above ground and sheltered by overhanging dead leaves. On 30 October 1962 it was lined with large soft, white and barred Kelp Goose *Chloephaga hybrida* feathers. When dismantled in January 1963, these Kelp Goose feathers were absent, possibly removed by other birds for use in their nests. The main structure was of dry grasses up to 20 cm long, with a few to 33 cm, woven in a circle and intermixed with root fibres. The lining consisted of 255 feathers from at least seven species and about 100 hairs of the Southern Sea Lion *Otaria byronia*. Feathers that could be identified included Grey-backed Storm-Petrel *Garrodia nereis* (171), Turkey Vulture *Cathartes aura* (31), Falkland Thrush (19), Short-eared Owl *Asio flammeus* (11) and Diving Petrel *Pelecanoides* sp. (2). The remaining 23 feathers could not be identified, except two of a penguin species and one probably from the Black-crowned Night Heron *Nycticorax nycticorax*. No Tussac-bird feathers were found, which was surprising because it is the commonest passerine on Kidney Island (Woods 1970).

On Carcass Island, a nest with nearly fledged young was found on 29 October 1983. It was at ground level by the base of a large tussac plant within a crack between dead stems. This nest was domed, with a large entrance, about 8 cm wide, in the top half. Another domed nest discovered on 1 November 1983 was in a similar site but was about 40 cm above ground with an entrance hole about 6 cm wide.

Field work on population densities in 1983

Information on habitats and territory size was obtained during passerine census work in tussac grass on Kidney Island (32 ha), West Point Island (51°20′S, 60°41′W, 1255 ha) and Carcass Island (51°18′S, 60°32′W, 1894 ha) during the southern spring of 1983 (Woods 1984).

West Point Island

The census plot (5.3 ha) looked similar to that on Carcass Island (4.2 ha, Fig. 2), with mature tussac grass replanted over 80 years earlier, interspersed with low grasses on a coastal slope. The tussac was suitable for nesting but Cobb's Wren was absent. The owner of West Point Island, R. Napier, told me in 1961 that he believed Cobb's Wren did not nest on the island. An important difference between the two

Figure 2. (a) Distribution of major vegetation types in the northern part of Dyke Paddock, Carcass Island, West Falkland; October 1983. (b) Outlines of Cobb's Wren territories in the same area. Nest-sites are shown in territories 4, 6 and 7. 50-m intervals are marked on the right-hand boundary.

islands (only 9 km apart) was the presence on West Point of feral cats, Norway Rats and House Mice. Carcass Island has remained free of rats and mice by chance, while successive owners have not kept more than one domestic cat. In the 1950s West Point Island was infested with rats but by 1961 there were few rats and many cats. In 1983, independent estimates of the number of feral cats by the four residents ranged from 20 to 50. Further evidence that cats reduce populations of passerines came from G. Bound (*in litt.*) in November 1985. He reported that on Bleaker Island, south of East Falkland, cats were absent for many years and wrens were then very common. During recent visits no wrens and few other small birds were seen, especially around the house. He also reported three domestic cats and the presence of rats.

Carcass Island

Figure 2a shows the main vegetation types in the Dyke Paddock census plot, where much of the shoreline had dense tussac to highwater mark. Figure 2b shows the territories drawn after 43 hours mapping of individuals over a period of 16 days. Of the eight passerine species recorded in the census plot, Cobb's Wren was second only to the Tussac-bird in the total number of records. Many simultaneous observations were made when a singing male stimulated adjacent males to sing. Several flight chases and some confrontations on the shore were also registered. Seven of the eight territories included a section of shore. One male (no. 8) sang quietly from a tussac strip up the slope behind other territories, perhaps because it was unmated or unable to defend a shore section. The nest in the largest territory (no. 7) was only 20 m from the boundary fence but this male was recorded over the 100 m to the shore and about 100 m along the shoreline. In contrast, the smallest territory included only 15 m of shoreline.

Comparison of Figures 2a and 2b shows that Cobb's Wren territories were smallest where tussac bordered a boulder beach with rotting kelp. This concentration occurred in the northwestern half where six males defended adjacent strips between 15 and 60 m long (average 35 m). There were fewer boulders at the northwestern end and 12 m of territory no. 1 included flat shelf rock below the tussac. Territories 6 and 7 met 10 m into a 30 m strip of flat rock. Territory 7 had only 40 m of the 100 m shoreline covered by boulders.

Only about one-third of the tussac in the plot was included in these territories though all shoreline tussac was within a defended territory. The two smallest territories (2 and 3) each had about half their area on a wider section of boulder beach with thick kelp. The two males often sang from boulders or dead tussac pedestals that had fallen on the beach. Territory 4 had a similar beach area but the tussac was mostly separated from the shore by some dense lyme-grass *Elymus arenarius*. This territory also extended 50 m up the narrow valley of a stream.

The difference in population density of Cobb's Wren between the census plot in a fenced tussac paddock and the sparsely vegetated 1.6 km of shoreline between the paddock and the settlement was striking. The shoreline was walked on the fine, nearly calm morning of 25 October 1983. Records were made of every singing Cobb's Wren located and the distance each bird moved along the shoreline after being flushed or stimulated into song by a tape-recording played briefly. Assessed in this way, there were six territories, and one isolated record. Territory sizes varied between 40 and 205 m of shore (average 93 m), separated by undefended lengths varying from *c*. 60 to *c*. 180 m (average 122 m). The shoreline varies from gentle slopes to cliffs up to 10 m high at the ends of ridges in the undulating ground. In places flat rocks project from the shore and there are several small bays below cliffs, with boulders and kelp. The vegetation along this shoreline consisted of short turf grazed by geese and sheep, dense patches of diddle-dee *Empetrum rubrum* on the ridges, eroded bare ground on slopes and rushes *Rostkovia magellanica* in hollows; there was no tussac.

Kidney Island

This is a prime example of an ungrazed offshore tussac island, though tussac was cut until the 1940s for livestock in Stanley (Woods

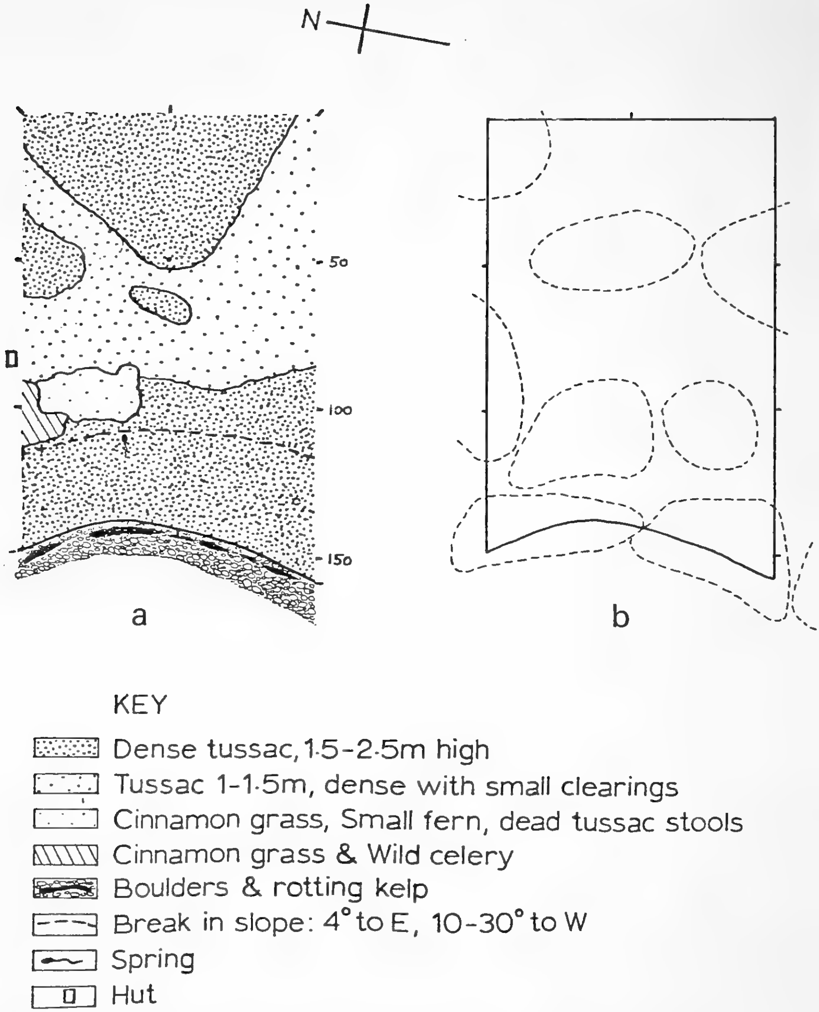

Figure 3. Distribution of major vegetation types in the census plot on Kidney Island, East Falkland; September 1983. (b) Outline of Cobb's Wren territories in the same area.

1970). In 1963 almost all the island was covered in tussac 1.5 to 2.5 m high and in 1983 the tussac was, if anything, more dense. The census plot was small (1.45 ha), due to difficulties in marking and using a 50 m grid in tussac reaching well above head height. Seven census visits were made, and territories were assessed by the method used in the B.T.O.'s Common Birds Census.

At least six territory-holding male Cobb's Wrens were found in the census plot (Fig. 3), where some occupied tussac 100 m or more from the shore and others used the beach for feeding and singing. Of the four territories occupying the coastal half of the plot, two extended along the shoreline and two were completely within dense tussac on the slope. Territories away from the shore seemed more widely scattered, perhaps because larger feeding areas were needed where the birds had no access to the beach. The population density of Cobb's Wren in the Kidney Island plot was similar to that in the northwestern section of the Carcass Island plot.

In September, passerine activity was recorded in three visits along 400 m of the shoreline, from the eastern corner of the census plot. The spread of registrations suggests that seven individuals held territories, with an average of *c.* 57 m of shoreline each, slightly longer than the average (45 m) found in the Carcass Island plot. The tussac cover around the Kidney Island bay was complete, whereas Cobb's Wrens on Carcass Island were competing for a very limited area of mature tussac with only patchy growth extending away from the shore. The 400 m of the shoreline consisted of boulders and dead kelp adjoining the tussac edge, with larger quantities of kelp over the 150 m at the eastern end.

Conclusions

Cobb's Wren is noticeably tolerant of humans, but, in contrast to the continental House Wren, it is rarely found close to settlements. Known populations of this resident and sedentary species are concentrated in mature tussac grass, probably because it offers excellent shelter from strong winds, provides potential nest-sites and materials and supports a larger invertebrate fauna than other Falkland habitats. Where tussac on a slope is adjacent to a boulder beach with accumulated dead kelp, conditions are further improved because the tussac is more vigorous and the potential food supply is increased by littoral invertebrates.

Cobb's Wren occurs up to 1.6 km (1 mile) from coastal tussac where the island is free of introduced mammalian predators. Its current distribution is closely related to the presence or absence of predators, particularly domestic and feral cats. Susceptibility to predation may have been increased by the shortage of dense cover during the destruction of tussac over the past two centuries. Poor agricultural management with widespread over-grazing and the burning of other inland grasses and low shrubs, in attempts to increase the availability of new growth as forage for sheep (Bourne 1988), have further depleted the available habitat and probably contributed to the isolation of Cobb's Wren populations on a few outer islands. These isolated colonies have produced examples of plumage aberration, particularly on Kidney Island at the eastern side of the archipelago.

The larger size, longer bill and wing of Cobb's Wren, and the marked ecological differences between it and the House Wren in the Americas, strengthen the case for treating it as a separate species, *T. cobbi*. It is vulnerable because it is almost exclusively found on tussac islands without introduced predators. Conservation measures with careful monitoring may be necessary if it is to survive.

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Re-evaluation of the taxonomic status of *Phylloscopus subaffinis arcanus*

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The description of *Phylloscopus subaffinis arcanus* Ripley (1950) was based on three specimens collected in Nepal in the non-breeding season. This was considered to be a significant extension (*c.* 1200 km) of the known range of *P. subaffinis*, the nominate race of which breeds in central and southeastern China and winters in southern China and neighbouring parts of Burma, Thailand and Indochina (King *et al.* 1975, Watson 1986, Cheng 1987, Lekagul & Round 1991). The alleged intermediate appearance of *arcanus* between *P. affinis* and *P. subaffinis* has been used as evidence of intergradation and to support the view that *P. affinis* and *P. subaffinis* are conspecific (Williamson 1967, Watson 1986). However, while Vaurie (1954, 1959) recognized *arcanus* as a subspecies of *P. subaffinis*, he wrote that "its validity and status require further study".

During a study of the relationships between *P. subaffinis* and *P. affinis*, P.A. studied one of the original specimens of *arcanus* (USNM 408867), and upon his suggestion this and the type (USNM 408868) were examined by S.D.R., J. P. Angle and P.C.R., and the third specimen (YPM 9494) by P.C.R. Our examination showed that USNM 408867 has only 10 rectrices, while both USNM 408868 and YPM 9494 are missing one rectrix each and have only nine. All other taxa recognized within the genus *Phylloscopus*, including *P. subaffinis*, have 12 rectrices. In addition, the tail is stongly graduated in all these *arcanus* specimens. The distance from the tip of the outermost to the tip of the innermost rectrix is 12 mm in USNM 408867, 15 mm in USNM 408868, and 8 mm in USNM 9494, while in all other recognized taxa of *Phylloscopus* warblers the tail is less strongly graduated; in *P. subaffinis* the distance from the tip of the outermost to the tip of the innermost rectrix is <5 mm, usually c. 3 mm.

The wing/tail ratio is 1.0 in the *arcanus* specimens (wing length measurement used is maximum wing length; Svensson 1984). In most *Phylloscopus* warblers the wing/tail ratio is in the range 1.2–1.4, and in no Eurasian form does it appear to be as low as 1.0. In *P. subaffinis* the wing/tail ratio is on average 1.18 in males and 1.17 in females (Alström & Olsson 1992). The wings of the three *arcanus* specimens are also more rounded than are those of *P. subaffinis*.

An additional difference is that the rictal bristles are prominent on all three *arcanus* specimens, whereas in Eurasian *Phylloscopus* warblers in general, including *P. subaffinis*, the rictal bristles are inconspicuous.

Finally, the bill is longer in *arcanus* than in *P. subaffinis*. Bill length to skull in the *arcanus* specimens is 13.8 mm (USNM 408867), 14.0 mm (USNM 408868), and 14.1 mm (YPM 9494), while in *P. subaffinis*, billlength to skull averages 12.1 mm in males and 12.0 mm in females (Alström & Olsson 1992).

The above characters are not compatible with *P. subaffinis* from China, nor with any member of the genus *Phylloscopus*. However, both in structure and plumage *arcanus* agrees perfectly with *Cettia f. flavolivacea*. This re-evaluation shows that *Phylloscopus subaffinus arcanus* is a junior synonym of *Cettia f. flavolivacea*, and that it clearly can no longer be considered a link or intergrade between *P. affinis* and *P. subaffinis* (*cf*. Alström & Olsson 1992).

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Body masses of birds of the *cerrado* region, Brazil

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Several papers published in this and other journals have stressed the importance of data on the body masses of birds (reviews in Nice 1938, and Clark 1979). However, there is a bias in the literature to reports on birds of forested regions. Body masses of Brazilian birds, for example, have been reported mostly for Amazonian localities (Oniki 1974, 1978, Novaes 1976, Bierregaard 1988, Graves & Zusi 1990, and Silva *et al.* 1990). The *cerrado* (savanna-like) region, which covers about 25% of Brazil, has only one comprehensive report on the body masses of birds made by Fry (1970). He gave the body masses of 156 species of birds from northeast Mato Grosso state. Reports that give limited data on the body masses of birds from the *cerrado* region include Sick (1958) (34 species from the Distrito Federal), Oniki (1980) (38 species from Minas Gerais state), and Oniki (1990) (15 species from Mato Grosso state).

This paper presents 571 body masses for 79 species of birds collected and mist-netted in eight localities in central Brazil between 1984 and 1990. We do not report here 246 body masses of 79 species which have small sample sizes or are wide-ranging. These are available from the authors upon request. We do report, however, small samples of species which are ecologically interesting or are relatively uncommon in the sites visited by us. Most birds were mist-netted or collected in 17 sites at the Distrito Federal (15°30′–16°05′S, 46°15′–48°15′W), Brazil. Other birds were also collected at the Represa do Rio Manso in Mato Grosso state (MA; 14°45′S, 56°W), Minaçú (MI; 13°30′S, 48°15W), São João da Aliança (SJ; 14°46′S, 47°30′W) and Silvânia (SI, 16°35′S, 48°45′W), in Goiás state; and at Paracatú (PA; 17°14′S, 46°52′W), Santa Fé de Minas (SF, 16°45′S, 45°30′W) and Ibiá (IB; 19°30′S, 46°31′W), in Minas Gerais state. Natural terrestrial habitats sampled include gallery forests, *cerrado sensu stricto*, grasslands, second-growth *cerrado, cerrado sensu lato*, deciduous forests, and wetlands. Some birds were also collected in man-made habitats (orchards, pastures, cities).

Body masses were taken with 30 g, 50 g, 100 g, and 300 g Pesola spring scales and with a 1 kg table balance. Mist-netted birds had masses recorded to the nearest 0.5 g, collected birds to the nearest 0.1 g. The use of different balances and different rounding methods may not affect the results since bird body masses may vary from 5 to 10% throughout the day, besides varying seasonally (Nice 1938, and references in Clark 1979). Taxonomy follows Meyer de Schauensee (1970). For samples sizes of 10 or more we give the mean ± 1 standard deviation, range, and sample in parenthesis. For samples smaller than 10, numbers in parentheses equal sample size for a particular mass value. Unless otherwise identified (by two letters in parentheses after the body mass) masses are from Distrito Federal. Body masses from different localities are separated by semi-colon. Sex and age identification (M, male; F, female; J, juvenile; S, subadult; I, indeterminate) was made whenever possible by examining the gonads of collected birds or by plumage characteristics of mist-netted birds. Double letters represent more than one individual. The classification by age and sex of *Antilophia galeata* follows Marini (1992). Specimens were deposited in the bird collection of the Departamento de Ecologia, Universidade de Brasília.

It may be noted that the list includes body masses of some poorly known birds endemic to the *cerrado* region (e.g. *Cypsnagra hirundinacea, Antilophia galeata, Neothraupis fasciata, Basileuterus leucophrys, Poospiza cinerea*). We stress the need of more records of body masses of birds from regions other than the Amazonian, such as the *cerrado*, the *caatinga*, and the Atlantic Forest.

Crypturellus undulatus: F 584.5; F 288.0 (MA)
Crypturellus parvirostris: M 155.3, F 165.3; M 160.0 (MI); F 157.0 (MA)
Ictinia plumbea: M 217 (MA)
Geranospiza melanoleuca: F 435 (PA)
Milvago chimachima: M 256 (PA); I 330 (SI)
Aramides cajanea: M 430.6; I 355 (SI)
Hoploxypterus cayanus: M 70.0 (SF); M 86.0 (MA)
Ara manilata: F 358 (MA)
Aratinga leucophthalmus: I 166 (SI)
Aratinga aurea: M 85.5, F 88.0 (PA); F 80.0 (SJ); F 87, I 90.0 (SI); I 81 (MA)
Aratinga auricapilla: M 130 (IB)
Amazona amazonica: F 400 (MA)
Coccyzus melacoryphus: II 37.5, 43.7; M 47.2 (MI)
Nyctibius griseus: F 169.0 (MA)
Nyctidromus albicollis: M 59.7, I 64.0
Caprimulgus parvulus: M 37.3, II 37.7, 38.2 (MI)
Trogon curucui: M 52.7 (MA); MM 57.9, 58.4 (MI)

Baryphthengus ruficapillus: I 142.0
Momotus momota: F 96.0 (MA)
Brachygalba lugubris: M 16.5 (MA)
Notharchus tectus: F 38.5 (MA)
Nystalus chacuru: M 50.0 (2), F 51.0 (MA)
Nystalus maculatus: II 37.0, 42.0 (MA)
Monasa nigrifrons: M 79.5 (MA); F 87.0 (MI)
Chelidoptera tenebrosa: M 33.5, F 37.8 (MA)
Pteroglossus castanotis: MM 227, 230, I 229 (MA)
Pteroglossus inscriptus: MM 104, 117, F 112 (MA)
Picumnus guttifer: MM 11.0, 12.4, I 11.5 (MA)
Chrysoptilus melanochloros: F 74.5 (MA)
Celeus flavescens: M 126.3 (MI); F 122.0 (MA)
Melanerpes cruentatus: MM 54.5, 60.1, F 57.0 (MA)
Leuconerpes candidus: M 112.7 (SJ)
Dendrocopus mixtus: I 23.4
Campephilus melanoleucus: M 217 (MA); M 228 (SJ)
Sittasomus griseicapillus: II 13.6 ± 1.0, 12.0–15.5 (19); F 10.8 (MI)
Xiphocolaptes albicollis: F 130.6
Dendrocolaptes platyrostris: M 56.2, F 64.5, II 55.0, 58.0; F 64.8 (MI)
Xiphorhynchus guttatus: F 53.5 (MI)
Lepidocolaptes angustirostris: F 25.3, II 22.7, 28.4
Poecilurus scutatus: M 14.3; II 15.4 ± 1.7, 13.5–19.5 (12)
Phacellodomus rufifrons: F 25.7
Philydor dimidiatus: F 29.7; II 29.4 ± 1.5, 27.0–32.0 (10)
Thamnophilus caerulescens: MM 20.0, 20.1, 22.5, 23.5, 24.0; MJMJ 23.0, 24.0; FF 21.0, 21.5 (2); I 28.5
Tityra cayana: M 67.8
Tityra inquisitor: M 38.5 (MI)
Antilophia galeata: MM 20.6 ± 1.9, 18.0–26.5 (39); SMSM 21.3 ± 1.8, 18.5–25.2 (15); IMIM 20.0 ± 1.2, 18.4–22.5 (12); FF 22.4 ± 1.6, 18.8–26.2 (19); II 20.4 ± 1.5, 17.2–23.0 (41)
Knipolegus lophotes: M 35.2 (SF)
Tyrannus albogularis: M 39.5
Emipidonomus aurantioatrocristatus: MM 20.0, 20.5 (MI)
Empidonax euleri: MM 11.2, 13.0, II 10.8 ± 0.8, 9.0–12.0 (17)
Elaenia flavogaster: M 22.0, FF 20.0, 21.7, 22.3, 23.4, II 21.0, 22.9, 24.5
Elaenia mesoleuca: MM 17.7, 18.1, FF 17.1, 19.5, II 17.5, 18.0, 18.2, 19.5 (2), 20.0, 22.0
Elaenia cristata: MM 17.5, 18.2, 19.0, II 16.0, 16.8, 18.3
Elaenia chiriquensis: MM 16.1 ± 1.0, 14.4–17.4 (10), FF 14.2, 15.0, 15.5, II 10.4, 14.6, 15.5 (2), 15.8, 16.0, 16.3; MM 15.5, 16.5, F 14.5 (MI)
Elaenia obscura: M 28.5, II 27.0, 28.0, 29.2
Cyanocorax cyanomelas: MM 185.0, 192 (MA)
Cyanocorax cristatellus: I 178.3
Cyanocorax cyanopogon: FF 132.6, 159.5 (MI)
Thryothorus genibarbis: MM 19.6, 21.0, F 17.0, I 18.5 (MA)
Thryothorus leucotis: II 20.5 ± 1.9, 16.0–23.0 (15)
Turdus nigriceps: M 48.9, II 47.5, 52.0, 56.0
Turdus leucomelas: M 60.0 (SF); M 67.0 (MI); MM 55.0, 56.0, FF 49.5, 59.5, 72.5 (MA); II 60.0 ± 7.0, 47.0–76.0 (21)
Turdus albicollis: II 55.8 ± 6.9, 47.5–67.5 (10)
Basileuterus flaveolus: MM 12.0, 13.0, 13.2, I 13.0 (MA); II 13.7 ± 0.9, 12.0–15.0 (13)
Basileuterus hypoleucus: II 11.4 ± 0.8, 10.0–13.0 (33); MM 8.0, 10.5 (2), 10.8 (MA); M 10.6, I 10.3 (MI)
Basileuterus leucophrys: II 15.0, 17.5 (2), 18.5, 19.5 (2), 20.0 (2), 22.0
Cyanerpes cyaneus: M 12.8 (MA)
Tangara cayana: MM 20.0, 20.5, 22.5 (2), MJMJ 20.0, 21.5, 24.0, II 19.0 (2), 20.5 (2), 21.5, 22.0, 22.5, 25.0; M 19.4 (MI); M 16.2 (SJ)
Tachyphonus rufus: MM 28.0, 29.0, 31.0 (2), 32.5 (2), 33.0, MJMJ 28.0, 29.5, 30.5, 31.5, II 30.7 ± 2.4, 27.5–33.7 (14); I 34.0 (SJ)
Trichothraupis melanops: MM 21.0, 21.5, 25.5, II 21.0, 21.5, 22.5 (2), 23.0, 24.0 (2)
Cypsnagra hirundinacea: F 34.0

Pyrrhocoma ruficeps: MM 15.5, 16.0, MJMJ 15.0 (2), 17.0, II 15.5, 18.0
Neothraupis fasciata: M 28.0, I 25.3
Saltator maximus: II 40.5, 51.5; M 46.0, I 42.0 (MI)
Saltator similis: II 43.3 ± 4.3, 36.0–54.0 (21)
Oryzoborus angolensis: I 14.0
Arremon taciturnus: M 23.8 (MI)
Arremon flavirostris: II 30.9 ± 1.2, 29.0–33.0 (11)
Poospiza cinerea: M 15.2 (MI)

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New distributional information on Mexican birds III. Northern Oaxaca

by Emma Cisneros-Palacios & Carlos Bonilla-Ruz

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The Mexican state of Oaxaca has been studied intensively by ornithologists, beginning with Deppe in 1825, Sclater and Sumichrast in the latter half of the 19th century, and more recently by Phillips (1964), Rowley (1966, 1984) and Binford (1989). However, several areas remain almost completely unknown ornithologically, including the two regions of northern Oaxaca treated here, La Cañada (the arid northern part of the state representing a southerly continuation of the Valley of Tehuacán), and the Sierra de Huautla (Binford 1989). In conducting field surveys in these two areas, we recorded one new species for the state of Oaxaca, one new record for the northern half of the state, and one significant range extension. Below, we document these records and present partial avifaunal lists for the two areas investigated.

During several months of field work in 1990 and various outings in preceding years, field parties from the CIIDIR-Oaxaca visited nine localities in northern Oaxaca as part of ongoing studies of the terrestrial vertebrates in the state of Oaxaca. These localities were as follows:

In low tropical deciduous forest (Arid Tropical Scrub of Binford 1989) at La Cañada: (1) 1 km N, 1 km E San José del Chilar, 650 m, 17°43′N, 96°55′W; (2) 2 km E of locality 1, 1000 m; (3) Vicinity of Santiago Dominguillo, 700 m, 17°39′N 96°54′W; (4) 3 km N, 3 km E San Pedro Jocotipac, at La Joya del Palmar, in cultivated land, 1700 m, 17°47′N, 97°02′W.

In the Sierra de Huautla: (5) Puerto de la Soledad in cloud forest, 2440 m, 18°09′N, 96°59′W; (6) 5.3 km N, 3.2 km E Teotitlán del Camino, gallery forest surrounded by humid oak forest, 1850 m, 18°10′N, 97°02′W; (7) Puente de Fierro in riparian sweetgum (*Liquidambar styraciflua*) forest with second-growth cloud forest on the surrounding slopes, 1650 m, 18°09′N, 96°51′W; (8) Maria Luisa in second-growth cloud forest, 1300 m, 18°12′N, 96°50′W.

Additional observations were made in the vicinity of Cerro San Felipe, 18.5 km N, 2.25 km W Oaxaca, in a riparian alder forest with arid pine-oak forest on the surrounding slopes. Vegetation types are based on maps from the National Institute of Statistics, Geography and Informatic (INEGI, maps E14-6 Orizaba and E14-9, Oaxaca), and on Rzedowsky's (1978) classification of Mexican vegetation. Observations were made during several days at each site, and voucher specimens were collected and deposited in the ornithological collection of CIIDIR-Oaxaca (OAX).

ELF OWL *Micrathene whitneyi*

On 21 March 1990, we collected a male Elf Owl (catalogue number OAX 123) at locality 3, in the canyon of an affluent of the Rio Grande, north of Santiago Dominguillo. On 15 June 1990, we took a female (OAX 124) at locality 2. Both localities support tropical deciduous forest with various species of *Bursera* and cacti such as *Neobuxbaumia* sp. and *Stenocereus weberii*. The male and female, respectively, had wing chords of 100.3 and 101.7 mm and weighed 32.9 and 26.2 g.

Binford (1989) mentioned this species as likely to be found in the state. Based on geographic distribution (Ligon 1968), these two specimens most likely pertain to the subspecies *whitneyi* of the Valley of Tehuacán, Puebla. Ligon (1968) suggested that this subspecies may be migratory, moving south between January and March, and that the breeding range may extend from Sonora south only to southern Puebla. Although the size of the gonads of the male was not recorded, and the ovary of the female was not greatly enlarged, the June collection date suggests that the Oaxaca population may be resident, since June is within the season of pairing and egg-laying documented by Ligon (1968). The holes used by the Elf Owls in Oaxaca most likely were excavated by the woodpecker endemic to the region, the Grey-breasted Woodpecker *Melanerpes hypopolius*, which was collected nearby at locality 1. The stomach of the male owl included the remains of Coleoptera, Hemiptera, Hymenoptera, Neuroptera and Scorpionidae, approximating the diet reported by Ligon (1968).

VIOLET-CROWNED HUMMINGBIRD *Amazilia violiceps*

On 16 June 1990 at San José del Chilar (locality 1), we collected two male Violet-crowned Hummingbirds. Binford (1989) mentioned Huajuapan (54.7 road km north-northeast, 1860 m [near Santiago Chazumba]), as the nearest locality, so this record extends the known geographic range by about 70 km and the collection dates by about one month.

AMERICAN DIPPER *Cinclus mexicanus*

On 14 September 1990, at Puente de Fierro (locality 7), we collected one male and one female American Dipper in a net suspended over a rushing stream. The size of the gonads of the male and female were, respectively, 3×1.5 mm and 8×3 mm. Another female was taken at our study site in the vicinity of Cerro San Felipe (see above) on 3 February 1986. These three specimens represent the first reliable records of the species from the northern part of the state (Binford 1989), filling a gap in the known distribution of the species.

Other species

In the following lists, numbers indicate the localities at which each species was encountered; asterisks denote those species recorded only by sight; and dates in parentheses are those of observation or collection in 1990.

Species detected in the four localities in La Cañada in low tropical deciduous forest were as follows: **Coragyps atratus* 2 (14 Jun); *Zenaida* *asiatica* 3 (21 Mar); *Columbina passerina* 1 (16 Jun); **Geococcyx velox* 1 (15 Sept), 2 (23 Nov); *Micrathene whitneyi* 2 (21 Mar), 3 (15 Jun); *Amazilia violiceps* 1 (16 Jun); *Momotus mexicanus* 2 (15 Jun); *Chloroceryle americana* 1 (17–18 Jun); *Melanerpes hypopolius* 1 (16 Sep); *Sayornis nigricans* 1 (15–18 Jun); *Polioptila caerulea* 1 (16 Jun); *Turdus grayi* 1 (16–18 Jun, 24–29 Nov); *Turdus rufopalliatus* 1 (16 Jun); *Passerina versicolor* 1 (17 Jun); *Ammodramus savannarum* 4 (18 Mar); *Icterus pustulatus* 1 (16 Jun).

Species detected at localities in the Sierra de Huautla in montane forest included the following: *Campylopterus hemileucurus* 7 (14 Sep); *Colibri thalassinus* 5 (17 Oct); *Amazilia cyanocephala* 7 (14–15 Sep), 8 (20 Oct); *Amazilia beryllina* 7 (14 Sep); *Lampornis amethystinus* 5 (12 Sep); *Lamprolaima rhami* 5 (12 Sep, 17 Oct); *Eugenes fulgens* 5 (13 Sep, 17 Oct), 6 (17 Oct); *Trogon mexicanus* 6 (11 Sep); *Empidonax hammondii* 6 (18–20 Oct); *Empidonax difficilis* 7 (15 Sep); *Cinclus mexicanus* 7 (14 Sep); *Myadestes occidentalis* 5 (12–17 Sep, 17 Oct); *Catharus occidentalis* 5 (12 Sep); *Turdus assimilis* 5 (17 Nov); *Melanotis coerulescens* 6 (18 Oct); *Seiurus motacilla* 6 (18 Oct); *Oporornis tolmiei* 8 (20 Oct); *Wilsonia pusilla* 8 (20 Oct); *Basileuterus rufifrons* 8 (20 Oct); *Basileuterus belli* 5 (18 Oct); *Cyanerpes cyaneus* 7 (14 Sep); *Chlorospingus ophthalmicus* 5 (24 Mar, 12 Sep); *Atlapetes brunneinucha* 6 (21 Oct); *Carduelis psaltria* 8 (20 Oct).

The Sierra de Huautla list includes a number of species that are ecologically restricted to both cloud forest and humid pine-oak forest, such as *Lampornis amethystinus*, *Lamprolaima rhami*, and *Atlapetes brunneinucha*, but only two, *Campylopterus hemileucurus* and *Chlorospingus ophthalmicus*, are largely confined to cloud forest. Further ornithological exploration of the Sierra de Huautla is needed to determine if a well-developed cloud forest community exists there, as predicted by Binford (1989).

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Willow Warbler *Phylloscopus trochilus* imitating the song of the Chiffchaff *P. collybita*

by Svein Haftorn

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A mixed singer of the genus *Phylloscopus*, most probably a Willow Warbler *P. trochilus*, was observed and tape-recorded at Heimdal (63°19′N, 10°21′E) close to Trondheim in central Norway in July 1983. A similar songster, probably the same individual, had claimed the same territory also in the previous year. The bird sang a pure Willow Warbler song (most commonly), a pure Chiffchaff song (less frequently) and a mixture of the songs of both species. It nearly always started with a varying number of Chiffchaff figures, which without any pause were followed by a final part of the Willow Warbler song. The immediate impression, that the Chiffchaff figures were bewilderingly similar to those of an authentic Chiffchaff, was fully confirmed by sonagram analyses, although the bird sang at a significantly higher speed.

For more than a hundred years it has been known that warblers of the genus *Phylloscopus* occasionally sing songs which are more or less a compound of normal Willow Warbler song and normal Chiffchaff song (see Tiainen 1991 and references therein). Understandably, some doubts were raised about the identity of such singers, whether they were genuine Willow Warblers or Chiffchaffs, or hybrids between these two species. Schubert (1969) reviewed the literature on this topic and came to the conclusion that the birds concerned were neither hybrids nor Chiffchaffs, but Willow Warblers that had learned the song of the sibling species. The mixed singers always lacked the typical, faint *trett* calls, which the Chiffchaff often utters during the pauses between songs. Another transcription of this call is *tirre* (Haftorn 1971), to indicate that it in fact is disyllabic (Fig. 1a).

More recently, Haensel & Lippert (1976) described a German mixed singer which they determined without doubt ("einwandfrei") as being a Chiffchaff, on account of morphological characters and the presence of species-specific *trett* calls between songs. Furthermore, in Ireland, Wilson (1986) observed a Chiffchaff mixed singer, the specific identity of which was established by trapping and ringing.

In a few cases "mixed singers" have been tape-recorded and their songs analysed by means of spectrographs (Schubert 1969, Haensel & Lippert 1976, Helb *et al.* 1985, Wolf 1986). In the present paper I describe the first known record of a mixed singer in Norway and probably the second record for Scandinavia as a whole. In April 1990 a mixed singer, that exhibited all the important characteristics of a Chiffchaff, was detected at Ängelholm, Scania, in Sweden (Fritz & Hernborg 1990).

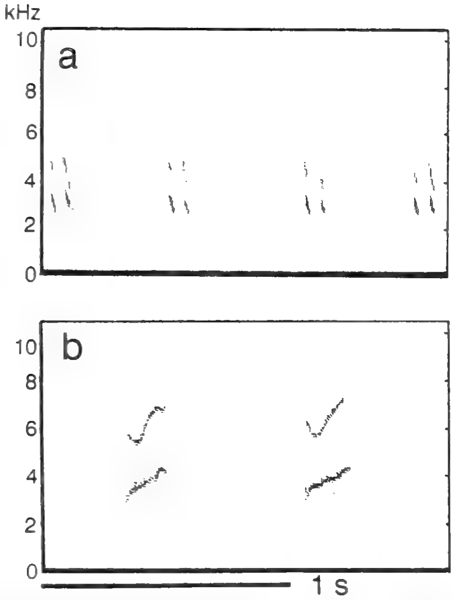

Figure 1. (a) The faint and dry *terr* or *tirre* sound, which the Chiffchaff frequently utters during the interval between songs (Klaebu, 28 June 1967). (b) The corresponding sound of the Willow Warbler, a soft note, which is inaudible at a distance, just as the Chiffchaff's *tirre*. The two calls depicted were given by the mixed singer at Heimdal (13 July 1983) between two songs. The same call is also seen as an introduction to the mixed song in Fig. 4.

Material and methods

In July 1983, Karl G. Larsson drew my attention to a peculiar Willow Warbler in the suburb of Heimdal (63°19′N, 10°21′E) close to Trondheim, in Sør-Trøndelag province in Central Norway. According to this observer the bird sang the song of the Chiffchaff in addition to its specific song. A bird with a similar song pattern, most likely the same individual, had been observed in exactly the same locality the previous year. However, it did not return in 1984.

On 17–18 July 1983 I watched the bird for several hours and tape-recorded the song. It claimed a rather small territory, comprising gardens with lawns bordered by spruce and deciduous trees. I heard Chiffchaff song in the vicinity and, some distance away, a Willow Warbler's typical song. According to Larsson, the Willow Warblers were clearly outnumbered by Chiffchaffs in this area.

The bird behaved like a typical Willow Warbler and sang when either sitting in the crown of a spruce or while foraging in the bushes and trees within its territory. For long periods at a time it uttered pure Willow Warblers songs (type 1), but then, at irregular intervals, it suddenly gave forth mixed songs with either figures of both species (type 2), or, though more seldom, typical Chiffchaff songs without any components of the Willow Warbler song (type 3). I tape-recorded 111 songs of type 1, 83 of type 2 and 16 of type 3. These totals do not reflect the true frequencies of the three different song types, however, because I deliberately selected periods during which the bird was inclined to incorporate figures from the Chiffchaff song.

The individual observed was not captured and its specific identity could therefore not be established from morphological characters. Two traits, however, provided good evidence that it was a Willow Warbler. Firstly, the frequency of normal Willow Warbler song was far higher than that of songs including Chiffchaff figures. Secondly, the bird never incorporated the *tirre* call, which is so typical for the song of the Chiffchaff. On the contrary, it used instead a faint *ui* note (Figs 1b and 4; see also Fig. 2c), which the Willow Warbler occasionally utters in the pauses between its songs and which seems to be species-specific. This *ui* note is probably homologous with the *tirre* call of the Chiffchaff.

The song was recorded using a Sony TC-D5 PRO recorder, fitted with a Dan Gibson reflector, and was analysed on sound spectrographs (Voiceprint ser. 700, and Uniscan II with hardcopy digital sonagrams printed on Epson FX-85 printer).

Results

As already mentioned, the bird's song repertoire contained three main versions: (1) the normal Willow Warbler song, which dominated its repertoire, (2) mixed song, which ranked second in numbers, and (3) pure Chiffchaff song, which definitely was the one most rarely performed.

Normal song

The normal song of the bird was of the 'spontaneous' type, i.e. that delivered in undisturbed situations (Fig. 2d–e). I never heard the "A-song" (sensu Järvi *et al*. 1980) used during territorial combats. Because the bird was not involved in any agonistic situation during my stay, performance of the A-song was unlikely in any case. For comparison, Figure 2a–c shows various types of 'spontaneous' songs of Willow Warblers from two other Norwegian breeding localities.

Mixed song

Mixed song consisted of parts of the song of the Willow Warbler and the Chiffchaff combined (Fig. 3). It nearly always started with the Chiffchaff song (sometimes very few figures as shown in Fig. 3d) and then it suddenly, without any break, switched to a final part of the normal Willow Warbler song. Thus, the complete Willow Warbler song was never incorporated into a mixed song. The bird simply replaced the first part of the conspecific song with figures taken from the Chiffchaff's song. The song length was apparently the same as that of its normal song (means 3.8 ± 0.61 s, $n=20$, and 3.5 ± 0.82 s, $n=21$, 2-tailed Mann-Whitney U-test, $P=0.19$).

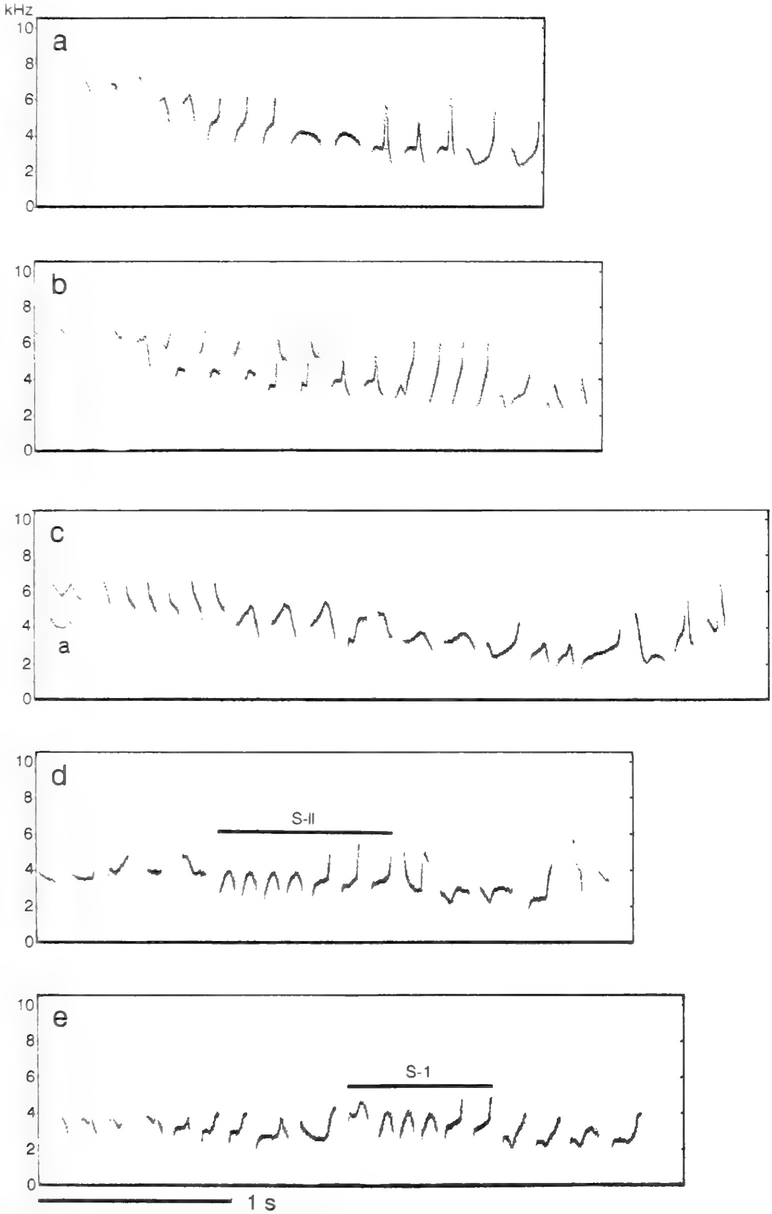

Figure 2. (a–b) Two types of full song by one and the same Willow Warbler (Klaebu, 18 May 1992). (c) Song by another Willow Warbler (Venabu, 24 June 1990). Notice the faint introductory note (a), which is homologous to the 'interval signal' shown in Fig. 1b, although somewhat different in shape. (d–e) Two versions of pure Willow Warbler song given by the mixed singer at Heimdal (13 July 1983). S-I–S-II=syllables I-II (see text).

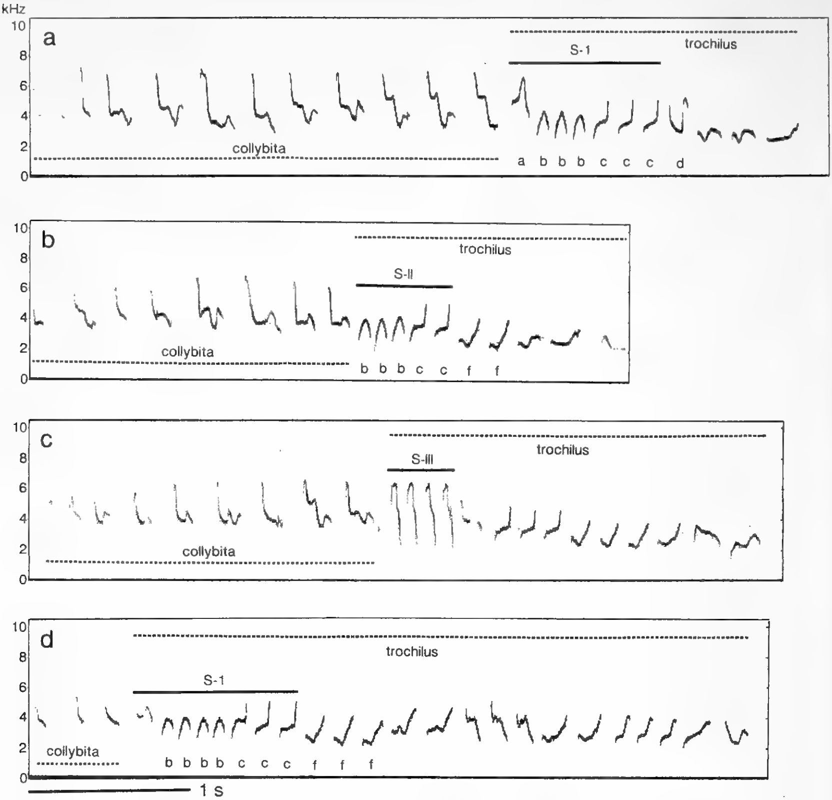

Figure 3. Four examples of mixed song given by the mixed singer at Heimdal (13–14 July 1983), starting with Chiffchaff figures and ending up with an abbreviated song of the Willow Warbler. See main text for further information. S-I–S-III=syllables I-III (see text).

The initial figures in the mixed song were usually incomplete and uttered very softly (as in normal Willow Warbler song), but then increased rapidly in loudness and became Chiffchaff-like. The total number of figures occurring in this a-part for the song was most commonly 6–13.

According to Järvi *et al.* (1980), each male Willow Warbler possesses about 80 different song figures. The present mixed singer possessed at least 36 different figures, the Chiffchaff-like ones omitted. When, sooner or later in the song, the bird switched over to the Willow Warbler part, the initial figures in this b-part were not selected at random, however. It clearly favoured two syllables, which were distinguished only by the first figure. The syllables I and II in Figure 3a, b were chosen in 30 and 24 instances, respectively, out of the total of 83 mixed songs recorded. A third syllable (III in Fig. 3c) was used only 6 times, whereas a variety of

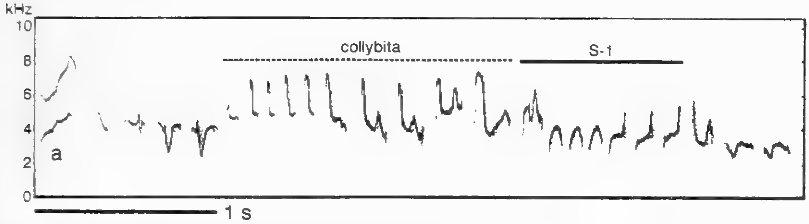

Figure 4. A series of Chiffchaff figures inserted in Willow Warbler song of the mixed singer at Heimdal (13 July 1983). The very first note shown (a) is a typical "interval signal" (see Fig. 1). The first figure in S-I is somewhat aberrant (cf. Fig. 3a).

figures opened the b-part in the remaining 23 mixed songs. The figures comprising the rest of the b-part varied somewhat in structure from one song to the next, the whole phrase descending in pitch and fading away in the usual species-specific manner. Quite often, however, the syllables I and II were followed by the figures d (Fig. 3a) or f (Fig. 3b,d). The overall impression was that the bird just copied a version of the final part of its normal Willow Warbler song. But a close study revealed that the syllables I and II did not appear nearly as often in the bird's normal song as they did in the mixed song; the respective proportions were 23.4% and 65.1% ($\chi^2=34.0$, $P<0.001$).

Only rarely did the bird deviate from the pattern described. Twice it started with the normal Willow Warbler song and then terminated with one Chiffchaff-like figure, and twice one and 10 Chiffchaff figures, respectively, were inserted into normal Willow Warbler song. In the latter case the character of the Chiffchaff song was almost lost because of the rapid sequence of figures (Fig. 4).

Copies of pure Chiffchaff song

Songs composed of pure Chiffchaff-like figures were recorded only 16 times. The first figures in each song were usually softer than in genuine Chiffchaff song (thus maintaining a marked Willow Warbler trait), but the rest of the song was extremely Chiffchaff-like (Fig. 5). Except for the hook on top of several imitated figures it is hard to see any difference from genuine song. Similar hooks may also be found, although rarely, in true Chiffchaff song as well (Thielcke & Linsenmair 1963). In fact, every one of the seven minute characters found in the 'basic' Chiffchaff figure (see Fig. 4 in Thielcke & Linsenmair 1963) was exactly copied by the imitator. The pitch (approx. 4–7 kHz) and the amplitude of the imitator's song were also identical with normal Chiffchaff song. And, just as in genuine Chiffchaff song, the pitch and amplitude were kept at the same level throughout, in contrast to typical Willow Warbler song, which falls in pitch and fades away.

In one respect the imitator clearly differed from the Chiffchaff, however. It sang its song at a significantly higher speed (more figures per unit time) than any of the three Chiffchaffs with which it was compared (Mann-Whitney U-test, 2-tailed, $P<0.001$). On the other hand, the song

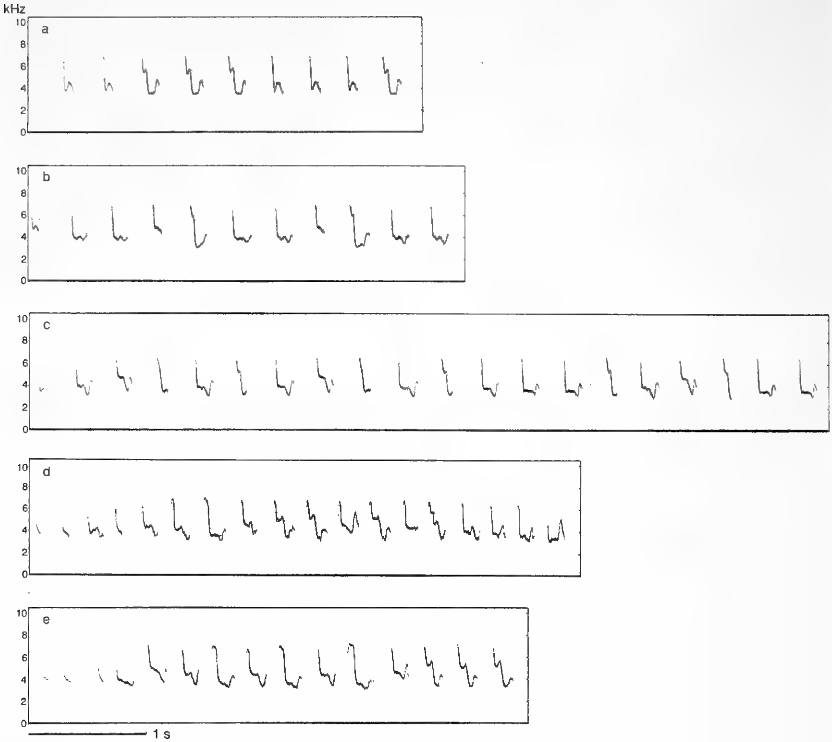

Figure 5. (a–b) Two songs of one and the same Chiffchaff (Klaebu, 18 May 1992). (c) Song of another Chiffchaff (Klaebu, 28 June 1967). (d–e) Examples of the mixed singer at Heimdal imitating pure Chiffchaff song (13–14 July 1983).

figures were delivered at a significantly slower rate than in normal Willow Warbler song, whether sung by the imitator itself (P<0.0001) or another Willow Warbler (P<0.0001). Hence, the speed of the imitator's pure Chiffchaff song was intermediate between true Chiffchaff song and normal Willow Warbler song. The speed depended on the duration of the intervals between the figures, not the length of figures.

Discussion

From the cases described in literature it appears that mixed singers of the Willow Warbler nearly always start with figures of the Chiffchaff song and then without break end up with the final part of the Willow Warbler song (Gwinner & Dorka 1965, Schubert 1969, Frost 1986, Wolf 1986). However, it occasionally happens that the birds reverse the order of song parts, or insert figures of the Chiffchaff in the Willow Warbler song (Schubert 1969, Wolf 1986, Tiainen 1991). The song of the bird described in the present paper, most likely a Willow Warbler (see "Material and methods"), was in complete accordance with this song pattern.

Also two mixed singers identified as Chiffchaffs began their songs with Chiffchaff figures and terminated with Willow Warbler song (Haensel & Lippert 1976, Wilson 1986). A ringed Scottish mixed singer turned out to be a bird which two years earlier was brought up by a male Chiffchaff and a female Willow Warbler. Its intermediate morphological characters indicated that it was a hybrid (Prato & Prato 1986). Its unusual song "was best described as Chiffchaff-type phrases preceding and following typical Willow Warbler song".

Hence, it seems justifiable to conclude that the Chiffchaff and Willow Warbler occasionally copy each other's songs and utter the sibling song along with or mixed up with species-specific song figures. This situation makes the hypotheses put forward by Gwinner & Dorka (1965) and Schubert (1969), namely that the Willow Warbler might be phylogenetically younger than the Chiffchaff and genetically have preserved a predisposition to learn the Chiffchaff song, less likely. The two European species of Treecreepers, *Certhia familiaris* and *C. brachydactyla*, are also known to copy each other's songs (Thielcke 1960).

That the bird described here delivered Chiffchaff figures at a higher speed than in normal Chiffchaff song, seems to be typical of such singers (Gwinner & Dorka 1965, Helb *et al.* 1985). Gwinner & Dorka (1965) also noticed that the Chiffchaff-figures of the mixed singer had a higher frequency than in the normal Chiffchaff song. The present imitator, however, uttered its Chiffchaff song at the same frequency level as in normal Chiffchaff song (in Fig. 5 compare a–c with d–e).

There seems to be a common trend among mixed singers to start with patterns of the alien species' song and end up with parts of the conspecific song. Good examples are provided by (the imitator coming first) *Certhia familiaris—C. brachydactyla* (Thielcke 1960), *Anthus trivialis—Emberiza citrinella* (Helb *et al.* 1985), *Fringilla coelebs—Carduelis chloris* (Helb *et al.* 1985), *Geothlypis trichas—Dendroica pensylvanica* (Kroodsma *et al.* 1983) and *Phylloscopus trochilus—Ph. collybita* (present paper).

Many species, including the Willow Warbler (Schubert 1976), are probably endowed with an innate 'auditory template' for learning their own specific song (see for example Slater 1989). Mixed singing could, according to Helb *et al.* (1985), be explained by "a temporary or permanent lack of a conspecific model together with exposure to an alien species during the sensitive phases of song learning". As these authors point out, a favourable condition for mixed song learning can be established when a species outnumbers its sibling species in an area of sympatry, which is in accordance with the numerical relationship between the Willow Warbler and Chiffchaff at Heimdal. Because of the numerical dominance of Chiffchaffs in this area (K. G. Larsson pers. comm.) a young Willow Warbler in its sensitive phase of song learning might have been tutored by neighbouring Chiffchaffs. Although the two species occupy almost mutually exclusive territories (Sæther 1983), it is likely that songs of Chiffchaffs are well within earshot of Willow Warblers reared in the area. Moreover, the Chiffchaff is an extraordinarily vigorous songster with a very long song period, enhancing its chances of being heard by young Willow Warblers in their critical phase of learning. The prerequisite for this explanation is of course that the actual mixed singer was brought up at Heimdal or at another locality where Chiffchaffs are abundant. The first alternative is the less likely, because natal philopatry is very low in the Willow Warbler. At Polish, Finnish and Scottish control areas only 0–2% of the nestlings and 2–5% of the fledglings were recovered (Tiainen 1991).

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Extinction of the Andalusian Hemipode *Turnix s. sylvatica* (Desf.) in the Mediterranean region

by Carlo G. Violani & Bruno Massa

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Among the 13 species of button quails belonging to the Old World and Australasian genus *Turnix*, the Andalusian Hemipode *Turnix sylvatica* (Desfontaines 1787) has been divided into the greatest number of subspecies (24 following Howard & Moore 1984, 9 according to Johnsgard 1991), and has the widest distribution (S.W. Europe, Africa north and south of the Sahara, E. Iran, India, S.E. Asia, Philippine Is., Indonesia, New Guinea and Bismarck Archipelago, N.W. Australia). In particular, in the western Palearctic, the range of the nominate subspecies *Turnix s. sylvatica* in historical times included the western and southern Iberian Peninsula, N.W. Africa from Morocco to N. Cyrenaica, N. Algeria and N. Tunisia, as well as Sicily where it became extinct around the beginning of the present century.

Current status

Today the presence of the Andalusian Hemipode (or striped Button-quail) in the western section of its former range (Mediterranean area) is strongly fragmented and poorly known. Urban *et al.* (1986) mention six records of the bird from the west and north coasts of Morocco since 1963; according to Bergier & Bergier (1991) the Andalusian Hemipode is a very rare resident, the biology of which is almost unknown in Morocco; it appears to be restricted to two regions, the eastern Mediterranean coast near the mouth of Moulouya wadi and the Atlantic coast between Casablanca and Safi. A recent observation of a single male singing (Thévenot 1989) was made in 1988 near Skhirat (north of the quoted Atlantic area). As regards Algeria, a last record from the mouth of Oued Zhour in 1976 was reported by Burnier (1979); no other recent record is reported by Ledant *et al.* (1981). In Tunisia, four individuals were recorded in 1972 10 km north of Cape Sousse by Thomsen & Jacobsen (1979). As regards Libya, Bundy (1976) considers it as a "possibly scarce resident and overlooked" and reports just one recent probable observation in palm scrub east of Garrabulli in 1967.

As regards the Iberian Peninsula, we were able to find few recent records, all in western Andalusia: a captured individual in the Doñana dunes, unspecified numbers observed in Huelva department (Purroy 1982), one at Coto del Rey in 1986, another in the Acebuche in 1987, and one pair in the same site in 1988 (Llandres & Urdiales 1990). In the Coto Doñana Museum there are six specimens labelled as from Huelva and Cadiz, dating from 1964 to 1981 (José Cabot *in litt.*). According to Llandres & Urdiales (1990), the Andalusian population is probably one of the last living in the Mediterranean area, once very common and widespread, now on the verge of extinction.

Finally, as regards Italy, the Andalusian Hemipode never inhabited Sardinia (*fide* Salvadori 1872; *contra* Cramp 1980: 534). This erroneous record probably originated from a very old mislabelled specimen in the Leiden Museum. It was instead a former resident breeder in Sicily, extinct not later than 1920, probably due to both hunting and land reclamation. According to Iapichino & Massa (1989) it occurred mainly in garigue with *Chamaerops humilis* along the south coast from Gela to Mazara, probably was scarcer near Catania and Ragusa, and was absent from northern Sicily (one shot near Palermo was reported as exceptional by Doderlein, 1869–74). It was fairly common in the 19th century (Benoit 1840), but greatly decreased during its last decades. Doderlein (1869–74) could shoot 10–15 hemipodes daily on the south coast in 1862–70, while Giglioli (1889) and Angelini (1892) listed *T. sylvatica* as nearly extinct. Whitaker (1896, 1905) reported that it was once plentiful in all parts of the southern and southwestern provinces, "where its favourite haunts were tracts of uncultivated moorland, among the clumps of dwarf broom-palm and other scrub vegetation". The last documented records were : singles shot at Falconara, autumn 1910 (Orlando 1958), and at Castelvetrano, 1913 (Sorci *et al*. 1973), and a doubtful occurrence at Agrigento in 1914 (Arrigoni degli Oddi 1929). Its extinction as late as the 1940–50s claimed by Orlando (1958) is considered a mistake (Iapichino & Massa 1989). The birds were sedentary and lived alone, except during the incubating period (May to the end of August), with the formation of monogamous pairs (Arrigoni degli Oddi 1929). Few specimens of genuine Sicilian origin are now preserved in the main Italian and foreign museums; they were collected in the wild not later than 1920.

Biometrics

In order to make a comparison with other sources, we have tried to get more mensural data from a larger number of specimens than those examined in Cramp (1980). We have examined several specimens of *T. s. sylvatica* (28 males and 44 females) from the ornithological collections of the Museums of Florence, Rome, Palermo, Terrasini, Turin, Geneva, Tring, Edinburgh, Belfast, Bonn, Leiden, Amsterdam, Vienna (see also Schifter 1992) and the collection of Istituto Tecnico di Modica, Ragusa; 12 males and 12 females of *T. s. dussumier* (Temminck), 32 males and 24 females of *T. s. lepurana* (Smith) (all in BMNH). The following measurements were taken: flattened wing and tarsus lengths according to Svensson (1975), upper mandible length from the feathering to tip (bill length). Because of the difficulties in taking accurate tail lengths from old skins, we did not use this measurement.

Table 1 gives the results geographically divided into three populations, namely Sicily, North Africa and Spain. We did not find any statistical difference between them (Sicilian *vs* North African, Sicilian *vs* Spanish, Spanish *vs* North African measures), except the wing length of Sicilian *vs* North African males (t test=2.53; $P<0.01$;

TABLE 1
Measurements of *Turnix sylvatica sylvatica* (Desf.), in mm

	Wing			Bill length			Tarsus		
	n	range	mean ± s.d.	*n*	range	mean ± s.d.	*n*	range	mean ± s.d.
				Sicily					
♂♂	15	73–92	87.07 ± 4.64	15	10–14	11.69 ± 1.11	15	20–24	22.35 ± 1.34
♀♀	12	83–97	92.58 ± 4.35	11	10.5–15	12.45 ± 1.32	11	20–26.3	23.41 ± 2.04
				North Africa					
♂♂	9	78–86	82.78 ± 2.61	9	9–13.2	11.60 ± 1.37	9	21–24.1	22.68 ± 1.09
♀♀	23	84–98	91.95 ± 4.18	22	11–15	12.82 ± 0.90	23	19–26	23.46 ± 1.62
				Spain					
♂♂	4	79–89	84.50 ± 4.10	4	11–12.5	11.62 ± 0.65	4	20–23.5	21.62 ± 1.63
♀♀	9	86–97	92.10 ± 3.75	8	12–14	13.19 ± 0.86	9	22–26	23.19 ± 1.35

TABLE 2
Measurements of the three subspecies of *Turnix sylvatica* considered, in mm

	Wing			Bill length			Tarsus		
	n	range	mean ± s.d.	*n*	range	mean ± s.d.	*n*	range	mean ± s.d.
				T. s. sylvatica (Desf.) (specimens in Table 1, combined)					
♂♂	28	73–92	85.32 ± 4.47	28	9–14	11.65 ± 1.15	28	20–24.1	22.35 ± 1.36
♀♀	44	83–98	92.16 ± 4.15	41	10.5–15	12.79 ± 1.06	43	19–26	23.29 ± 1.68
				T. s. dussumier (Temm.)					
♂♂	12	65–72	67.70 ± 2.07	12	9–11	9.75 ± 0.72	12	16.5–18	16.80 ± 0.51
♀♀	12	70–76	73.60 ± 1.55	12	10–12	10.70 ± 0.62	12	17–20	18.33 ± 0.94
				T. s. lepurana (Smith)					
♂♂	32	72–80	75.90 ± 2.24	33	9–12	10.60 ± 0.66	33	16–20	18.48 ± 0.99
♀♀	24	75–89	82.90 ± 3.20	24	10–12.5	11.20 ± 0.73	24	18–21	19.40 ± 0.96

f.d.=22). This difference may be due to the degree of isolation of the Sicilian population. We also found significant differences between males and females in wing length (t test Sicily=3.151; $P<0.01$; f.d.=25; North Africa=6.079; $P<0.001$; f.d.=29; Spain=3.286; $P<0.01$; f.d.=11) and between North African and Spanish specimens in bill length (t test North Africa=2.900; $P<0.01$; f.d.=28; Spain=3.194; $P<0.01$; f.d.=10).

Thus we pooled together all sexed specimens from Sicily, North Africa and Iberia (Table 2). We were able to broaden considerably the range of wing length for the males (73–92 mm), as compared with 83–92 given in Cramp (1980). For females, although our maximum wing length was shorter than that reported by Cramp, our range was somewhat wider: range 83–98, mean 92.2, cf. 91–101 and 97.3 in Cramp, whose measurements were based on a smaller number of skins.

Because we also examined the BMNH and RMNH specimens, used for biometrics in Cramp (1980), it is possible that differences between our results and those reported by Cramp (1980) could be the result of different techniques in taking measurements. For bill and tarsus lengths, both for males and females, our results widen the range given in Cramp (1980). We found statistically significant differences between males and females (t test wing length=6.584; $P<0.001$; f.d.=69; bill length=4.215; $P<0.001$; f.d.=66; tarsus=2.731; $P<0.01$; f.d.=68).

We have some data to support the hypothesis that Mediterranean *Turnix sylvatica* is a good taxon, isolated from sub-Saharan and Asiatic forms. Table 2 reports our results compared with biometric data of *T. s. lepurana* from sub-Saharan Africa and *T. s. dussumier* from Asia, which should be the geographically closest living forms. Our measurements of *T. s. lepurana* do not differ much from those recorded by Urban *et al*. (1986); only the female wing is notably longer than ours, 86.5 *vs* 82.9. The wing length of *T. s. dussumier* measured by us is slightly different from what has been reported by Vaurie (1965) (males, 70.6 *vs* 67.7; females, 75 *vs* 73.6).

As a matter of fact, there are remarkable biometric differences, well justified by the great isolation of these populations and by the high degree of sedentariness which prevents any gene flow. The differences between *T. s. sylvatica* and both *T. s. lepurana* and *T. s. dussumier* are highly significant (t test: in all the cases $P<0.0001$); we also found statistical differences between *T. s. lepurana* and *T. s. dussumier* (t test, males: bill, wing and tarsus, $P<0.0001$; females: wing, $P<0.0001$; bill, $P<0.05$; tarsus, $P<0.003$). The circum-Mediterranean form might be considered as an example of gigantism by isolation.

Concluding remarks

Today the Andalusian Hemipode is present in only 3–4 small areas of its original Mediterranean range and probably its total population is so small as to be considered on the very brink of extinction. Biometric data of the Mediterranean form show that it is very different from sub-Saharan and Asiatic forms; thus its extinction would mean the irretrievable loss of an example of Mediterranean endemism. Any future attempt aiming at replacing *Turnix s. sylvatica* with other subspecies for reintroduction purposes would be therefore unjustified and should be totally discouraged.

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Stabilization of the scientific name for the White-browed Treecreeper (Climacteridae) by neotypification

by Richard Schodde

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Until 1922, the White-browed Treecreeper, *Climacteris affinis* Blyth, had been known as *Climacteris superciliosa* North. North's *superciliosa* was based on identifiable extant specimens in the Australian Museum (lectotype: AM 0.9160, male) which had been collected at Illara and Bagots Creeks, central Australia, on the Horn Scientific Expedition (North 1895, 1896, Longmore 1991). They are the brown-rumped western subspecies presently known as *Climacteris affinis superciliosa* North, 1895 (*cf.* Macdonald 1969).

In 1922, Mathews (1922, 1923–4) concluded that *superciliosa* North, 1895 was preoccupied by *affinis* Blyth, 1864 as the senior name for the species. His opinion followed Gadow's (1883) earlier association of *affinis* Blyth with the Red-browed Treecreeper *Climacteris erythrops* Gould, 1841, before Red-browed and White-browed Treecreepers were treated as separate species (e.g. Mathews 1912; *cf.* Howe 1921, Keast 1957). Blyth (1864) had described *Climacteris affinis*, along with *Pomatorhinus pileatus* for the Australian Chestnut-crowned Babbler, from a batch of skins sent to him at the Asiatic Society of Bengal, Calcutta, from the then Melbourne Institute. The provenance of his material of both species was, as Mathews (1923–4: 121–3) pointed out, probably the same, that is, northwest Victoria or southwest New South Wales. Not only the White-browed but also the Brown Treecreeper *Climacteris picumnus* Temminck, 1824 occur in that region.

Mathews' determination of the identity of *Climacteris affinis* Blyth, like that of Gadow (1883) before him, was based entirely on interpretation of its original description (Blyth 1864). This Mathews (1923–4: 123) quoted verbatim: "Like CL. ERYTHROPS, but with slight pale non-rufous *supercilia*, which are not conspicuously noticeable: throat dull whitish, passing to greyish on breast, and a small central ferruginous spot at base of throat: ear-coverts pale, streaked. Specimen doubtless of the female sex." Its identification with the White-browed Treecreeper was accepted by the RAOU Checklist Committee (1926), with the result that *Climacteris affinis* Blyth became firmly established as the senior name for this species.

From the reference to the "ferruginous spot" on the throat, there can be no doubt that *affinis* Blyth was based on a female. However, its described traits, when compared with those of females of both White-browed and Brown Treecreepers in Table 1, match those of the Brown, not the White-browed, *pace* Mathews (1923–4). To check its identity, I attempted to trace the holotype. This specimen, originally in the museum of the Asiatic Society of Bengal, passed with its collections to the Indian Museum, Calcutta, which came under the aegis of the

TABLE 1
Traits of female White-browed and Brown Treecreepers in comparison with characters described for *Climacteris affinis* Blyth in its protologue

Trait	female White-browed Treecreeper	female Brown Treecreeper	*Climacteris affinis* Blyth, as described
supercilia	white, suffused deep rufous over upper margins; distinct	plain off-white; less distinct	pale, non-rufous; not conspicuously noticeable
throat	(greyish-) white	dull cream-white	dull whitish
breast	heavily streaked, feathers with white shafts and rufous to dusky margins	plain greyish fawn	greyish
sexual markings	broad rufous streaking to feather margins over upper breast, extending to lower throat	small group of rufous spots (on feather margins) restricted to centre at base of throat	small central ferruginous spot at base of throat
ear coverts	contrastingly streaked with narrow white shafts and dark grey feather margins	palely streaked, with broad cream shafts and dull grey feather margins	pale, streaked

Zoological Survey of India in 1916 (Sharpe 1906: 312; Mathews 1925, S. S. Saha pers. comm.); it was not among material transferred to the British Museum during the late 1800s (Sharpe 1906: 395), and is not cited among specimens and types of *Climacteris* in BMNH by Gadow (1883) or Warren & Harrison (1971). According to S. S. Saha, the officer presently in charge of the bird section of the Indian Museum (pers. comm.), much of the avian collection of the Asiatic Society in the Indian Museum, including its specimens of Australian origin, was destroyed by an earlier Superintendent; and most of the remainder were lost later by flood when the collections were shifted temporarily to Benares (=Varanasi) during World War II. No trace of the type of *Climacteris affinis* or of any other nominal species of Australian birds described by Blyth can now be found there. I confirmed this result on a visit to the Indian Museum in May 1992.

The specific application of *Climacteris affinis* Blyth thus now rests on its original description alone, which *favours* synonymy with *Climacteris picumnus* Temminck. This transfer would not only introduce confusion to specific and infra-specific nomenclature in *Climacteris* but also remove from the White-browed Treecreeper the scientific name by which it has universally been known for 70 years. To avert such potential instability in the absence of a name-bearing specimen, I here designate a neotype for *affinis* Blyth which is identifiable with the White-browed Treecreeper, female. It is ANWC 38739, female, from the topotypic locality Dareton on the border between northwest Victoria and southwest New South Wales and is deposited in the Australian National Wildlife Collection, CSIRO, Canberra, ACT, Australia. It is of the grey-rumped eastern subspecies to which *affinis* Blyth has conventionally been applied (*cf.* Macdonald 1969).

Neotypification here accords with the provisions of Art. 75 of the *International Code of Zoological Nomenclature* (I.C.Z.N. 1985) and has the unanimous concurrence of the Taxonomic Advisory Committee of the Royal Australasian Ornithologists Union and Professor W. J. Bock, Secretary-Convenor of the Standing Committee on Ornithological Nomenclature of the International Ornithological Committee.

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Distributional records, natural history notes, and conservation of some poorly known birds from southwestern Ecuador and northwestern Peru

by Brinley J. Best, Christopher T. Clarke, Matthew Checker, Amanda L. Broom, Richard M. Thewlis, Will Duckworth & Angus McNab

(Continued from p. 119)

CHAPMAN'S ANTSHRIKE *Thamnophilus zarumae* T

This distinctive antshrike was found at six sites in Loja Province, Ecuador, and at Ayabaca in Piura Department, Peru, from 800 to 2625 m (the highest study-site). The Utuana (2500 m) and Ayabaca (2625 m) records were higher than the previously known upper altitudinal limit of 2200 m (R. Ridgely). *T. zarumae* was uncommon to fairly common in Semi-evergreen Lower Montane and Humid Montane Cloud Forest and in secondary scrub, being most common above 1500 m (rare in *Ceiba*-dominated Deciduous Forest below 1000 m at Tambo Negro). Individuals or pairs foraged at mid-upper storey level, and fed on insects and fruits, including the berries of a tree in the family Meliaceae. Males called with a series of descending notes; females and males also gave a soft contact call, *piuur* or *ow* (all three vocalizations were tape-recorded).

In accordance with Ridgely & Greenfield (in prep.), *T. zarumae* is treated here as a species distinct from *T. doliatus*, from which it is geographically isolated and differs in plumage (males having barring only extending to the mid-belly, and solid black crests) and vocalizations. Although previously considered to be threatened (dropped from the Red Data Book candidate list after initial consideration; N. Krabbe), our observations and those of other workers (e.g. Bloch *et al*. 1991, R. Ridgely) have shown this species is not in danger, as it occurs commonly in degraded areas.

GREY-HEADED ANTBIRD *Myrmeciza griseiceps* T, endangered

We found this skulking and enigmatic antbird on four occasions. On 22 September 1989 several were heard and one female seen in bamboo below Humid Montane Cloud Forest at Cerro Chacras above Ayabaca, Piura Department, Peru. The call was short, harsh, nasal *ursz*. On 5 February 1991 at Tambo Negro, Loja Province, Ecuador, a female and an unsexed individual foraged through thick undergrowth with Black-capped Sparrows *Arremon abeillei* beneath *Ceiba*-dominated Deciduous Forest. On 6 February 1991 at Utuana (also Loja Province), a male in bamboo below Humid Montane Cloud Forest uttered a distinctive short, trilled *tiirrrrr* (Fig. 3a). Immediately after the bird uttered one trill, a low *trrr-trrr* and an *uzzzz* were heard from within the same bamboo patch; possibly a second bird replying. The trill,

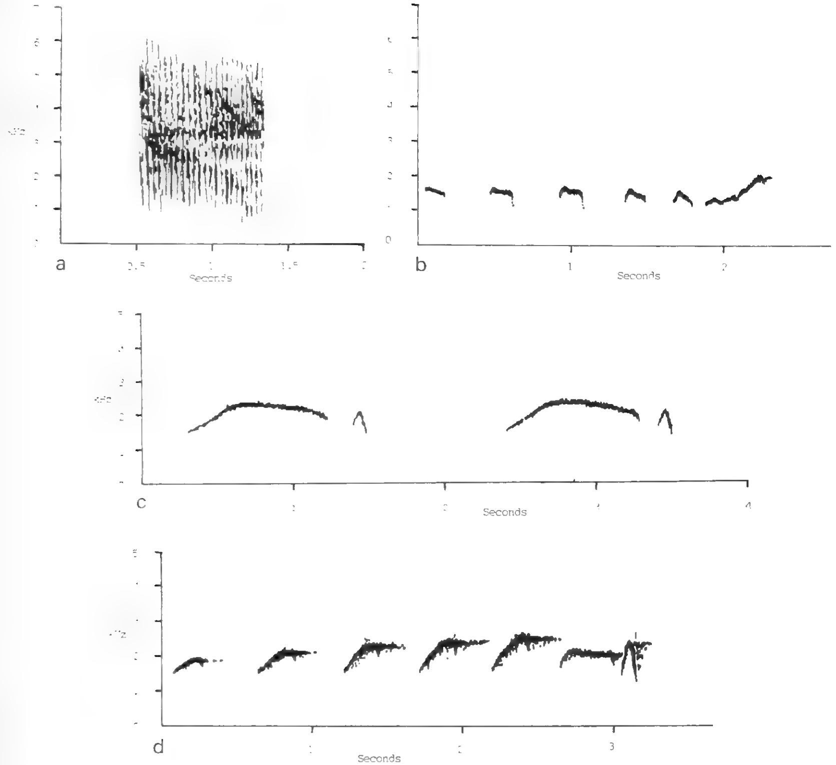

Figure 3. Calls of (a) *Myrmeciza griseiceps*, (b) *Grallaria watkinsi*, (c) and (d) *Attila torridus*; a, c and d from recordings made by F. Lambert.

which has not been previously described, probably represents the territorial song of this poorly-known species.

Many bird species in southwestern Ecuador breed during the rainy season (Appendix B, Marchant 1958), and these are the first records of this species during that period. Assuming the *M. griseiceps* also breeds at this time, it is thus not surprising that what we consider to be its territorial song has not hitherto been heard. The generic position of the species is unclear (Ridgely & Greenfield in prep.): it may prove not to be a *Myrmeciza*. The presumed song apparently does not match any known antbird genus, emphasizing the need for a taxonomic revision.

On 15 and 16 February 1991 at least five further males gave the presumed territorial song from thick bamboo and non-bamboo undergrowth above Vicentino in Loja Province. When not vocalizing *M. griseiceps* can be almost impossible to detect in its impenetrable habitat. It is confined to a very small area of Ecuador's Loja and El Oro Provinces and adjacent Tumbes Department, Peru, and we believe it to be one of the most threatened of the Tumbesian endemics, being at risk from deforestation, and understorey clearance and trampling.

WATKINS' ANTPITTA *Grallaria watkinsi* T

Recorded at five sites in Loja Province, Ecuador, from 500 to 2000 m, on the forest floor and on the ground beneath scrub. It was most easily located by the territorial call, a loud, frequently given, 6–9 note whistle (Fig. 3b). This call is quite distinct from the three-note whistle of the Chestnut-crowned Antpitta *G. ruficapilla*, with which *G. watkinsi* was considered conspecific by Meyer de Schauensee (1970).

Ridgely & Greenfield (in prep.) treat the two as separate species, and they are usually separated by altitude, but from January to March 1991 at Quebrada Yaguana near Sozoranga, *G. watkinsi* overlapped with *G. ruficapilla* in the altitudinal range 1600–2000 m in the same habitat; below 1600 m only the former species occurred and above 2000 m only the latter. *G. watkinsi* was extremely difficult to observe, being seen only a handful of times and only once above the forest floor, apparently preferring more viny, humid undergrowth.

G. watkinsi was formally considered threatened by deforestation and understorey clearance, being especially vulnerable because of its tiny range (dropped from the Red Data Book candidate list after initial consideration; N. Krabbe). Additionally it has been found in degraded areas by several workers in southwestern Ecuador (this study, R. Ridgely) and is thus no longer considered to be at risk. It has recently been found in a new area: the coastal hills of western Ecuador (Krabbe 1992, Parker & Carr 1992), which extends its known range northward.

BLACK-CRESTED TIT-TYRANT *Anairetes nigrocristatus*

We recorded this distinctive species for the first time in Ecuador at Utuana, extreme southern Loja Province, on 14 September 1989, and it was subsequently found there on 6 February 1991. In September 1989 a male and a female foraged together in low shrubs in a clearing adjacent to cloud forest. In February 1991 a male and female were again in the same area, and two sightings of single males were made nearby. On all four occasions the conspicuous black and white plumage and broadly white-tipped tail of the males were seen. These records extend the known northern limit of *A. nigrocristatus* into extreme southern Ecuador from Piura Department, Peru. Fjeldså & Krabbe (1990) treated *A. nigrocristatus* as a species distinct from *A. reguloides*, of which it was previously considered a subspecies (Meyer de Schauensee 1970).

RUFOUS-CROWNED TODY-TYRANT *Poecilotriccus ruficeps*

On 23 September 1989 an individual foraged in low, humid secondary growth adjacent to cloud forest at Utuana, Loja Province, Ecuador. This is only the second report of *P. ruficeps* on the Andean west slope in Ecuador south of Chimborazo Province (the two records collectively extend the known west-slope range south by about 250 km). More significantly, the Utuana individual did not resemble the northwest Ecuadorian subspecies *P. r. rufigenis*, since it possessed a strongly rufous head and thick black border to the crown. In these respects it was very close to the nominate *P. r. ruficeps* of southeastern Ecuador. Interestingly, a MECN specimen of *P. r. ruficeps*, collected by M. Olalla in 1968, is labelled "Cordillera de Tinajillas, Loja Province" (Krabbe 1991). That and the present record indicate that the form occurring in southwestern Ecuador may be *P. r. ruficeps* of eastern Ecuador rather than *P. r. rufigenis* of the northwest, a pattern mirrored by the Chestnut-breasted Coronet *Boissonneaua matthewsii* (R. Ridgely). However, subspecific determinations in this species are difficult and some further revision may be necessary (R. Ridgely, T. Schulenberg).

GREY-BREASTED FLYCATCHER *Lathrotriccus griseipectus* T, vulnerable/rare

Although not detected during our 1989 survey, several were found in *Ceiba*-dominated Deciduous Forest at Tambo Negro (Loja Province) from January to March 1991, and one individual was located in Semi-evergreen Lower Montane Cloud Forest at 1750 m at Quebrada Suquinda (Sozoranga, also Loja Province) on 1 February 1991, extending the known upper altitudinal limit by 350 m. *L. griseipectus* was restricted to forest understorey, where individuals performed short aerial sallies. One bird chased another through the understorey on 4 February, otherwise they occurred singly. Birds uttered a weak trilled call, *pyur-peer*, and a longer three-note *peeee-peee-peee* (tape-recorded).

Since this species was not found in August and September 1989 at Tambo Negro (the dry season), it may make seasonal movements. Such movements are suggested by records of *L. griseipectus* (considered a Tumbesian endemic by Cracraft 1985 and Stattersfield *et al.* in prep.) as far north as Mindo, Pichincha Province (0°02′S, 78°48′W, BMNH specimen), and Río Verde, Esmeraldas Province (1°05′S, 79°30′W, Norton *et al.* 1972), both in the northwest of Ecuador; there are also a small number of records from the upper Marañon valley of northeastern Peru (specimens in FMNH and LSUMZ; Collar *et al.* 1992); this phenomenon is discussed further by Clarke (in press). *L. griseipectus* is threatened by widespread habitat clearance (Collar *et al.* 1992, Best in press). Previously considered a member of the genus *Empidonax*, Ridgely & Greenfield (in prep.) place this species in the genus *Lathrotriccus* which was originally erected for Euler's Flycatcher *L. euleri* (Lanyon & Lanyon 1986).

OCHRACEOUS ATTILA *Attila torridus* T, endangered

This scarce attila was found at four Ecuadorian sites in February 1991, three in western Loja Province and one in southern El Oro, in semi-evergreen and evergreen forest from 900–1700 m. The 1700 m record extends the known upper altitudinal limit of the species by 375 m. Two birds sang in each of two forested ravines at Tierra Colorada (Humid Lower Montane Cloud Forest) from 7 to 20 February, and photographs were obtained. One was seen in the mid- and understorey making short aerial sallies (once to the ground), and moving quickly from branch to branch, pumping its tail constantly.

One singing bird was accompanied by a second individual in a remnant forest patch at Quebrada Las Vegas (Humid Lower Montane Cloud Forest) NE of Alamor on 18–19 February. One silent individual perched in the lower mid-storey on the edge of a forest patch (Very Humid Premontane Cloud Forest) at Buenaventura west of Piñas; it frequently changed perch, scanning intently from each. One bird sang from humid forest at 1700 m, *c.* 3 km W of Celica at 4°05′S, 79°58′W, in early February.

Three different vocalizations were heard and tape-recorded: a drawn-out whistle, rising then falling in pitch (Fig. 3c); the presumed true song: a series of 5–7 short whistles ascending in pitch followed by a deeper, two note finale *too-teeoo*, the second note rising then falling (Fig. 3d); and a rapid *woop-wee-oo-oo-ee*, the first note upward inflected, the second highest in pitch, and the final note higher than the third and fourth. *A. torridus* is almost confined to remnant humid forest patches in the Tumbesian region (there is one record from SW Colombia: Blake 1959) and appears to have been overlooked by Collar & Andrew (1988), probably through lack of data. Recent studies have shown the species to be apparently forest reliant, and it has been listed in the Red Data Book of the Americas (Collar *et al.* 1992).

GOLDEN-NAPED TANAGER *Tangara rufivertex*

At least two birds were present at each of two sites in Ecuador, Tierra Colorada and Alamor (both Loja Province), and a few sightings were made at a third, Buenaventura (El Oro Province), during February and March 1991. These records represent a small southward range extension on the Andean west slope as the species had not previously been reported from Loja Province (Ridgely & Tudor 1989, Ridgely & Greenfield in prep.); additionally there are no other recent records from El Oro Province (R. Ridgely).

DUSKY BUSH-TANAGER *Chlorospingus semifuscus*

Uncommon at Buenaventura (El Oro Province, Ecuador) in February and March 1991 in the understorey of Very Humid Premontane Cloud Forest, especially where *Weinmannia, Clusia* and *Chusquea* occurred. This species was not recorded at Buenaventura by Robbins & Ridgely (1990) during 75 observer days in the dry season (July–August) over several years, and may be a seasonal visitor to this site (see discussion). This record extends the known range of *C. semifuscus* in Ecuador south by about 300 km from Pichincha Province. Buenaventura is also the most southerly known locality for several other humid forest passerine species (e.g. Pale-vented Thrush *Turdus obsoletus*, Black-chinned Mountain-Tanager *Anisognathus notabilis*), being the southern terminus of the very humid Pacific slope upper-tropical cloud forest of Colombia and Ecuador (Robbins & Ridgely 1990).

BLACK-EARED HEMISPINGUS *Hemispingus melanotis piurae*

We documented the first Ecuadorian record of this very distinctive race at Utuana (extreme southern Loja Province) on 14 September

1989; it was subsequently found to be fairly common there in that year. The same subspecies was also found in small numbers at Cerro Chacras, above Ayabaca in Piura Department, Peru. The black crown, broad white supercilia and strongly rufous underparts were all clearly seen (and photographed), allowing easy distinction from *H. m. ochraceus* of western Colombia and western Ecuador. Groups of 3–8 individuals foraged through the understorey and in Humid Montane Cloud Forest trees, in single-species flocks and occasionally also with Plushcaps *Catamblyrhynchus diadema* in bamboo. *H. melanotis* was not seen at Utuana in 1991; this is potentially troubling as a considerable amount of the cloud forest and bamboo seen in 1989 had by then been burned, and this species (and others) may have been adversely affected. However, it is also possible that local seasonal movements take place. The form *piurae* may prove to be a distinct species (Ridgely & Tudor 1989) and the above record extends its known range north from Piura Department, Peru, into southern Ecuador.

BLACK-AND-WHITE TANAGER *Conothraupis speculigera*

This poorly-known tanager was found at several Ecuadorian sites in 1991 from 320 m (the lowest study-site) to 1800 m as follows: a calling male at Uzchurrumi (El Oro Province) on 15 February; at least four calling males at Vicentino on 15 and 16 February (one seen); 10 in acacia scrub at Catacocha on 4 March; a calling male at Panacillo (Sozoranga) on 6 March and 10 March; and four calling males along a 400 m trail at Tambo Negro on 7 March (all Loja Province). At all times the species occurred in scrubland away from forest. Others were seen or heard calling from scrub on numerous roadside stops between the study sites.

The call was a two note *zit-zoo*, with a peculiar icterid-like quality. No *C. speculigera* were seen at Tambo Negro between 26 January and 7 February 1991 (when very little rain had fallen, and the vegetation was almost leafless), but the species was easily located there after 6 March that year (after several weeks of rain). This may indicate that this species moves into the area to breed in the rainy season. Indeed, there is evidence that the species breeds in southwestern Ecuador and migrates over the Andes to northeastern Peru at the end of the wet season (Ridgely & Tudor 1989, L. Kiff). A 1987 WFVZ specimen from Tayntza in Morona-Santiago Province was the first from eastern Ecuador (R. Ridgely).

BLACK-COWLED SALTATOR *Saltator nigriceps* T

Found at three sites in Loja Province, Ecuador, from 1550 to 2500 m, occurring alone in the mid- and upper storeys of semi-evergreen and evergreen forest and in scrub away from forest. The species was seen every few days at Utuana and Sozoranga during August and September 1989 and was found at two sites from January to March 1991: Utuana, where a calling bird in an area of low scrub uttered a short *psee-psiu* on 6 February (tape-recorded by F. Lambert); and Sozoranga where four singles were seen, one of which sang. This species was given near-threatened status in Collar & Andrew (1988), but our records indicate that it readily survives in degraded habitat, as noted elsewhere within its restricted range (e.g. Bloch *et al.* 1991); its near-threatened status has been dropped in Collar *et al.* (1992). *S. nigriceps* is sometimes considered a subspecies of the Golden-billed Saltator *S. aurantiirostris* (Fjeldså & Krabbe 1990). We follow Ridgely & Greenfield (in prep.) in treating *S. nigriceps* as a species distinct from *S. aurantiirostris*, the closest race of which (*iteratus*) does not seem to approach *nigriceps* in appearance, lacking the buff throat and underparts, pronounced white post-ocular stripe, and white basal half to the tail of that race. Their voices are known to be very dissimilar (R. Ridgely).

Discussion and conclusions

From a distributional standpoint, the most interesting study site was Utuana in southern Loja Province, Ecuador. In addition to documenting it as the only known Ecuadorian site for *Anairetes nigrocristatus* and *Hemispingus melanotis piurae* of northern Peru, we also established the noteworthy occurrence there of an unidentified race of *Poecilotriccus ruficeps*. A third potential addition to the Ecuadorian avifauna at Utuana is a possible Peruvian Sheartail *Thaumastura cora* observed by P. Coopmans in July 1991. Further investigation of this site at different times of year may reveal additional new distributional information.

There is some evidence that local seasonal bird movements occur in southwestern Ecuador: two sites for which data exist from the wet and dry seasons show seasonal fluctuations in their avifauna. At Buenaventura, west of Piñas, in El Oro Province, Ridgely & Robbins [ANSP] (1990) made intensive surveys during the dry season (concentrated on July and August; 75 observer days) with only 4 observer days in the wet season; there has also been a short February study (2 observer days) by N. Krabbe and F. Lambert (Krabbe 1991). Our work, 38.5 observer days in February–March 1991, thus represents the first significant survey of this site during the rainy season. Clarke (in press) found that there are at least 12 species (excluding austral migrants) which have only been recorded from Buenaventura at one season. This amounts to about 6 percent of the total avifauna recorded from the site. At Tambo Negro in extreme southern Loja Province, a similar proportion were recorded only from one season. Local seasonal movements may occur throughout the Tumbesian region and the topic is discussed further in Clarke (in press).

Prior to our surveys many of the Tumbesian endemics were primarily (or even solely) considered inhabitants of deciduous forest. With the exception of *Synallaxis tithys* each threatened Tumbesian species was found in both deciduous and semi-evergreen or evergreen forests. Evidence is also accumulating to support the theory that Tumbesian species may move between habitats throughout the year. Such information has clearly demonstrated that any regional conservation plan must seek to protect all the forest types of the Tumbesian region rather than just the deciduous types.

TABLE 1

Restricted range species recorded at 14 sites in southwestern Ecuador and 1 in northwestern Peru

	Sites														
Endemic Bird Area	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Tumbesian	2	7	0	6	14	9	10	16	9	10	2	21	7	26	6
Chocó/Pacific Andes	0	1	0	8	1	0	0	0	0	0	0	0	0	0	0
South Central Andean forests	0	0	0	0	0	0	0	1	2	0	0	1	2	0	2

Site numbers correspond to: 1, Río Rircay; 2, Uzhcurrumi; 3, Oña; 4, Buenaventura; 5, Vicentino; 6, Alamor; 7, Tierra Colorada; 8, Catacocha; 9, Celica; 10, El Empalme; 11, El Ceibo-Zapotillo; 12, Sozoranga; 13, Utuana; 14, Tambo Negro; 15, Ayabaca.

Of 340 species recorded, 44 have restricted ranges. These are representatives of three Endemic Bird Areas (Stattersfield *et al.* in prep.). Species from the lowland Tumbesian (33 species) and Chocó/Pacific slope Andes (8 species) EBAs, together with 3 species from the more montane South Central Andean forests EBA. This was reflected in the avifauna of our study sites: Tumbesian endemics dominated lower-altitude sites (e.g. Tambo Negro [site 14], Sozoranga [site 12]) whereas those at higher elevations contained a larger proportion of Andean endemics (Ayabaca [site 15], Utuana [site 13]). The strong altitudinal effects can be seen by comparing the avifauna of Sozoranga and Utuana. Sozoranga was surveyed as low as 1300 m, whereas at Utuana work was confined to forest patches on the 2500 m contour. This 1200 m difference in altitude was enough to reduce the number of Tumbesian endemics found at Utuana by almost 70 percent (from 21 to 7 species) despite the fact that the two sites are only 7 km apart. The more humid forests at higher elevations such as at Utuana are clearly unsuitable for most Tumbesian endemics. Table 1 summarises the records of restricted range species at the 15 study sites.

The 8 Chocó endemics recorded were confined to four humid forest sites below 1800 m, all 9 being found at Buenaventura (the most humid forest surveyed). This is not surprising since the characteristic vegetation of the Chocó region is humid lowland rainforest. The humid forests of southwestern Ecuador mark the southern limit of several Chocó endemics.

We established that in southwestern Ecuador many bird species breed during the rainy season (December–April). In addition to the 8 species mentioned in the text, 50 other species exhibited breeding behaviour from January to March 1991 (Appendix A). For 45 species, our results appear to be the first published breeding data from southwestern Ecuador. In the dry season survey (August and September 1989), breeding behaviour was observed in only two species. Data from the Santa Elena peninsula, situated 200 km to the northwest, points to a similar congruence between breeding activity and seasonal rains (Marchant 1958). In northern study sites (especially

Buenaventura), the breeding season seemed ahead of sites further south. Fully-fledged young of several species were observed at Buenaventura (3°40′S) in early March 1991, whereas at Tambo Negro (4°23′S) most species were nest-building or incubating at that time. This may be due to local climatic variations.

In the study area as a whole, the distributional and ecological data collected on the poorly known species are also of value, especially as their habitats are fast disappearing. Several forest patches shown on 1986 satellite images had been largely removed by 1991. We found 9 of 15 Tumbesian endemics which are considered threatened by Collar *et al.* (1992). Field reconnaissance and analysis of satellite images has revealed that there is only one continuous forest patch with an intact under-storey (Tambo Negro) larger than 10 km^2 in the whole of western Loja and El Oro Provinces (Kessler in press). Dodson & Gentry (1991) showed that in lowland western Ecuador south of Esmeraldas Province, less than 5 percent of the original forest remains. Although the ecology of many Tumbesian endemics is still poorly understood, our information and that in Collar *et al.* (1992) suggest that many species are ill-equipped to withstand any further forest fragmentation.

The two 'protected' areas which could potentially secure the long-term future of 10 of the threatened Tumbesian endemics (but not *Penelope albipennis, Pyrrhura orcesi, Syndactyla ruficollis, Myrmeciza griseiceps* and *Atlapetes pallidiceps*) are the Machalilla National Park in Manabí Province, Ecuador, and the North-West Peru Biosphere Reserve in Tumbes Department, Peru. Unfortunately the park authorities in both areas lack resources and man-power, and there are many problems in the parks, including illegal settlement (Collar *et al.* 1992). Because they remain so vulnerable, outside investment and support, allowing effective protection of these areas, is an immediate priority. But as all the threatened Tumbesian endemics do not occur within these areas, a forthcoming conservation strategy for the threatened Tumbesian avifauna (Best in press) will also include the protection of forest fragments within southwestern Ecuador, including those in the Celica and Tambo Negro regions surveyed during the current survey.

Abstract

New distributional and ecological data on 31 bird species, gathered during wet and dry season surveys in the Tumbesian region of Ecuador and Peru, are presented. Black-crested Tit-Tyrant *Anairetes nigrocristatus* and Black-eared Hemispingus *Hemispingus melanotis* of the race *piurae* were recorded in Ecuador for the first time; range extensions or new upper altitudinal limits were obtained on a further 15 species. Nine threatened and eight near-threatened species were found; of a total 341 species recorded 45 are restricted range endemics, belonging to three different Endemic Bird Areas. The wet season months of January–March were found to be the breeding season in the Ecuadorian Provinces of Loja and El Oro. Deforestation in the region has been so intense that several species may not be able to persist much longer if current trends continue.

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APPENDIX A

Details of the 15 study-sites in southwestern Ecuador and northwestern Peru

For each site the following information is listed: (i) site number and name (see Figure 1 for map showing locations), (ii) central coordinates, (iii) altitudinal range over which observations were made, (iv) dates of surveys, (v) habitat notes, (vi) area of investigation (if the site comprised more than one distinct area).

*denotes sites which were ornithologically unknown prior to our surveys

1. *Río Rircay Valley**, Azuay Province, ECUADOR; 3°17'S, 79°15'W, 1000–1850 m: 4½ observer days, 15, 22 & 24–25 Feb 1991. Mainly degraded and aridified agricultural land, with some tiny patches of Semi-evergreeen Intermontane Cloud Forest and scrub along water courses. Four localities investigated close to the main Machala-Cuenca road: 3°16'S, 79°14'W (1200–1450 m), 2 km E of Calderon; 3°20'S, 79°26'W (1000 m); 3°17'S, 79°21'W, 10 km W of Sta Isabel town (1600 m); 3°20'S, 79°18'W (1750–1850 m), Hacienda Quesada, 7 km S of Sta Isabel.
2. *Uzhcurrumi**, El Oro Province, ECUADOR; 3°21'S, 79°33'W, 320–1500 m: 6 observer days, 15 & 22 Feb 1991. Mostly degraded agricultural land with very small patches of Moist Lowland Forest. Two localities investigated: area up to 4 km E of Uzhcurrumi village, on north and south side of río Jubones at 3°20'S, 79°34'W (320–500 m); c. 15 km SE of Uzhcurrumi along dirt road to Guanazán at 3°23'S, 79°32'W (1000–1500 m).
3. *Oña*, Azuay Province, ECUADOR; 3°25'S, 79°07'W, 1800–2330 m: 4 observer days, 13–14 Feb 1991. Mainly degraded and aridified agricultural land with some tiny patches of Semi evergreen Intermontane Forest and scrub, mainly along water-courses. Two localities investigated: 3°24'S, 79°07'W (1800–1930 m), 10 km N of Oña; 3°27'S, 79°07'W (2330 m), 4 km S of Oña.
4. *Buenaventura*, El Oro Province, ECUADOR; 3°40'S, 79°44'W, 900–1000 m: 38½ observer days, 24 Feb–4 Mar 1991. Several patches of Very Humid Premontane Cloud Forest with cattle-pastures, c. 9 km W of Piñas town at Buenaventura, along road to Machala. Surveyed in detail in recent years by ANSP (Robbins & Ridgely 1990).
5. *Vicentino**, Loja Province, ECUADOR; 3°57'S, 79°57'W, 900–1450 m: 9½ observer days, 8 Feb, 14–18 Feb 1991. Patches of Humid Lower Montane Cloud Forest with cattle pastures and crop-land to the E and SW of Vicentino village. The ridge and small section of río Tamine valley along mule-trail to E of Vicentino (to 3°56'S, 79°52'W) and small forested ravines to SW of Vicentino, along dirt road to Alamor town (to 3°57'S, 80°00'W) were surveyed.
6. *Alamor*, Loja Province, ECUADOR; 4°00'S, 80°00'W, 1200–1450 m: 5½ observer days, 13–14 & 18–19 Feb 1991. Patches of Humid Lower Montane Forest NE of Alamor town, along dirt-road to Vicentino village as far as Quebrada Las Vegas at 3°59'S, 79°59'W.
7. *Tierra Colorada**, Loja Province, ECUADOR; 4°02'S, 79°57'W, 1400–1850 m: 36 observer days, 9–19 Feb 1991. Humid Lower Montane Cloud Forest at a valley head, surrounded by crop-land and cattle-pastures, c. 13 km E of Alamor town. Area of investigation included section from valley head along mule-trail to its meeting point with main Alamor-Celica road 2 km S of Mercadillo.
8. *Catacocha**, Loja Province, ECUADOR; 4°03'S, 79°40'W, 1400–1750 m: 4½ observer days, 4–5 & 7–8 Mar 1991. A patch of Semi-evergreen Lower Montane Cloud Forest surrounded by crop-land and cattle-pastures c. 6 km NW of Catacocha town, just N of the main road to Macará. Area of investigation included roadside vegetation between Catacocha and forest patch.
9. *Celica*, Loja Province, ECUADOR; 4°07'S, 79°58'W, 1800–2100 m: 5 observer days, 6–8 Feb 1991, 14 & 20 Feb 1991. Humid Montane Cloud Forest patches and cattle-pastures up to 5 km W of Celica town along road to Alamor.
10. *El Empalme*, Loja Province, ECUADOR; 4°07'S, 79°51'W, 800–900 m: 2 observer days, 7 & 17 Feb 1991. Degraded *Ceiba trichistandra*-dominated Deciduous Forest and crop-land along río Catamayo. Two localities investigated: area around the military checkpoint at 4°07'S, 79°50'W and a ravine with some less degraded forest 6 km to the NW at 4°06'S, 79°49'W.
11. *El Ceibo-Sabanilla**, Loja Province, ECUADOR; 4°15'S, 80°08'W, 350–750 m: 1 observer day, 18 Feb 1991. Below 400 m: degraded acacia woodland; above 400 m: large, but degraded tracts of *Ceiba trichistandra*-dominated Deciduous Forest.
12. *Sozoranga*, Loja Province, ECUADOR; 4°21'S, 79°47'W, 1300–2615 m: 1989, 100 observer days, 8–20 Aug & 8–21 Sept 1991; 19 observer days, 30 Jan–1 Feb, 6 Feb, 5–6 Mar & 9–11 Mar. Patches of Semi-evergreen Lower Montane Cloud Forest (mainly confined to ravines) and roadside crop-land, cattle-pastures and scrub to the NE, ENE and

NW of Sozoranga town along roads out from the town. Most important localities: Panacillo (coordinates as Sozoranga) [1750–1800 m] c. 2 km NE of Sozoranga town, along road to Utuana; Quebrada Yaguana 4°19'S, 79°48'W (1550–1800 m), Quebrada Suquinda 4°18'S, 79°49'W (1550–1800 m) and Quebrada Namballe 4°17'S, 79°49'W (1650–1850 m), 3, 4 and 6 km NW of Sozoranga along dirt-road to Nueva Fatima; and Cerro Florida 4°18'S, 79°47'W, 3 km ENE of Sozoranga, along dirt-road to El Empalme. Area of investigation also included (but only for 5 observer days) ridge (1400–2000 m) and mountain peaks 'Jatumpampa I and II' (2580 m; 2615 m) 1–5 km ESE of Sozoranga, with patches of Humid Montane Cloud Forest, scrub and cattle-pastures.

13. *Utuana**, Loja Province, ECUADOR; 4°22'S, 79°43'W, 2500 m: 12 observer days 13–14 & 21–25 Sept 1989; 4 observer days 5–6 Feb 1991. Humid Montane Cloud Forest on Loma Llambalanga 1–2 km SW of Utuana village, surrounded by agricultural land.

14. *Tambo Negro**, Loja Province, ECUADOR; 4°24'S, 79°51'W, 600–1000 m: 70 observer days, 24 Aug–7 Sept & 26–30 Sept 1989; 42½ observer days, 16 Jan–7 Feb & 6–9 Mar 1991. The eastern fringe of an E–W ridge almost entirely covered by *Ceiba trichistandra*-dominated Deciduous Forest extending to at least 1500 ha (the largest patch of remaining forest with an intact understorey in western Loja and El Oro Provinces). Area of investigation centred on Quebrada Hueco Hondo and the adjacent ridge to the W, c. 5 km SW of Sabiango town.

15. *Ayabaca**, Piura Department, PERU; 4°36'S, 79°44'W, 2625 m: 7 observer days 22–26 Sept 1989. Cloud forest and cattle-pastures at Cerro Chacras, 2 km N of Ayabaca town.

APPENDIX B

Bird species recorded on two surveys in the Tumbesian region of Ecuador and Peru

This list of all species recorded on the two surveys of southwestern Ecuador (including species found on the 1989 survey at Ayabaca in northwestern Peru) includes the following information:

Restricted range species (RR): following the lists of Stattersfield *et al.* (in prep.) and belonging to the following EBAs: A=S. Central Andean forests; C=Chocó/Pacific slope Andes; and T=Tumbesian.

Altitudinal range (AR): the altudinal range over which each species was recorded during our surveys is given to the nearest 25 metres. For those species which were only encountered once, or where the limit of sightings=the limit of effort for species seeen many times, the altitude of that record is given in parenthesis.

Species recorded: Each site where a species was recorded in indicated by means of a number code corresponding to the sites listed in Appendix A. The sign "*" is attached to records which refer to the 6–9 March 1991 visit to Tambo Negro.

Relative abundance: at five sites where at least six consecutive days were spent (Buenaventura, Tierra Colorada, Sozoranga, Utuana [1989 visit] and Tambo Negro), relative abundances are indicated by the following codes (all observers' records combined: C common, >10 individuals seen or heard daily; FC fairly common, ⩽10 individuals recorded daily, U uncommon, recorded on at least every other day; R rare, recorded once or twice only. The letter L is used for sites where a species occurred principally in part of the site (e.g. a river), which was only occasionally visited.

Breeding data: the following codes are attached to the site concerned: c Copulation; d Display; f Adult carrying food; i Adult investigating nest-hole; m Adult carrying nest material; y Fledged young; fy Adult feeding young; na Nest with adult; nb Nest-building; nf Nest found, contents not established; ny Nest with young.

Status (following species name):**threatened (Endangered, Vulnerable, Rare or Indeterminate) species (Collar *et al.* 1992), *near-threatened species (Collar *et al.* 1992).

Sequence and nomenclature follow Ridgely & Greenfield (in prep.).

	RR	AR	Aug–Sept 1989	Jan–Mar 1991
*Crypturellus transfasciatus**	T	600–1000	14-FC	14-C
Nothoprocta sp.		1800–2500	12-R	12-R
Phalacrocorax brasilianus		600	14-L	14-L
Ardea cocoi		600	—	14-L

	RR	AR	Aug–Sept 1989	Jan–Mar 1991
Casmerodius albus		600	14-L	14-L
Butorides striatus		600	—	14-L
*Tigrisoma fasciatum**		(1500)	—	7-R
Sarkidiornis melanotis		600–1000	—	14-L
Vultur gryphus		(1850)	—	1
Sarcoramphus papa		450–2000	12-R, 14-R	11, 14-R
Coragyps atratus		(325)–2500	12-C, 13-U, 14-C	2, 4-C, 5, 6, 7-C, 8, 10, 11, 12-C, 14-C
Cathartes aura		(325)–2500	12-C, 13-C, 14-C	1, 2, 4-FC, 5, 7-C, 8, 10, 12-FC, 13, 14-C
Leptodon cayanensis		(1000)	—	4-R
Chondrohierax uncinatus		900–1400	—	4-R, 7-R
Elanoides forficatus		(325)-1900	—	2, 4-FC, 6, 7-U, 9, 14-U
Accipiter ventralis		2400–(2625)	12-R, 13-U, 15	12-R, 13
A. bicolor		(1800)	12-R	—
Leucopternis princeps		900–1450	—	4-U, 7-U
*L. occidentalis***	T	(325)–1800	—	2, 4-FC, 5-d,m, 6, 7-FC-d, 9-d
Harpyhaliaetus solitarius		(1800)	12-R	—
Buteogallus urubitinga		600–1800	12-R	4-U-m, 6, 7-U, 14-U-m
B. meridionalis		600–1900	14-FC	4-R, 6, 7-U, 9, 14-R-m, d
Geranoaetus melanoleucus		900–(2625)	12-R, 13-R, 15	1, 4-R-m, 12-R, 13
Parabuteo unicinctus		800–2000	12-FC, 14-FC	4-R, 5, 6, 7-R, 9, 10, 12-U, 14-U
Buteo magnirostris		(325)–(2625)	13-R, 15	2, 4-U-d, 5, 7-R
B. leucorrhous		2500–(2625)	13-R, 15	—
B. polyosoma		600–2000	12-U, 13-U, 14-R	8, 12-R
B. albonotatus		600–(2625)	15	7-R, 14-R
Spizaetus tyrannus		900–1450	—	4-U, 7-U, 10, 12-R
S. ornatus		900–1000	—	4-R
Polyborus plancus		600–1500	14-FC	4-U, 6, 7-R, 12-R, 14-U
Herpetotheres cachinnans		600–800	14-FC	14-U
Micrastur ruficollis		900–1400	—	4-R, 7-R
Falco sparverius		600–2000	12-U, 14-U	4-R, 6, 7-R, 9
F. rufigularis		600	14-U	14-U
*Ortalis erythroptera**	T	750–1900	12-R, 14-R	4-U, 5, 6, 7-C-d, 8, 9, 12-FC, 14-R
*Penelope barbata***	A	(2625)	15	—
P. purpurascens		1300–1500	—	5, 7-R
P. barbata/purpurascens		(1500)	—	2
Chamaepetes goudotii		900–1000	—	4-U-y
Odontophorus erythrops		900–1600	—	4-U, 7-U
Laterallus albigularis		900–1000	—	4-L
Aramides axillaris		(1400)	—	12-R
Charadrius vociferus		600	14-L	—

continued

	RR	AR	Aug–Sept 1989	Jan–Mar 1991
Tringa melanoleuca/flavipes		600	14-L	—
Actitis macularia		600–1200	14-L	2, 4-L, 5, 6, 14-L
Gallinago sp.		600	—	14-L
Columba fasciata		900–(2625)	12-U, 13-U, 15	4-U, 6, 7-U, 9, 12-U-d
C. subvinacea		900–1600	—	4-R, 7-U
C. plumbea		900	—	4-R
Zenaida auriculata		800–(2625)	12-U, 13-R, 14-R, 15	8, 10
Columbina buckleyi	T	(325)–1200	—	1, 2, 14-R
C. cruziana		(325)–1700	12-C, 14-C	2, 11, 12-FC-c,y, 14-C
Claravis pretiosa		(650)	14 R	—
*Leptotila ochraceiventris***	T	650–(2625)	12-U, 14-U, 15	5, 8, 12-U, 14-R*
L. verreauxi		(325)-(2625)	12-U, 13-U, 14-C, 15	1, 2, 5, 7-FC, 8, 10, 12-C, 14-FC
Geotrygon montana		600–1600	12-R	4-R, 14-R
G. frenata		900–(2625)	12-R, 15	4-U, 6, 7-U, 8, 12-R, 13
*Aratinga erythrogenys**	T	(325)-2500	12-U, 13-U, 14-C	2, 4-FC, 5, 6, 7-C, 8, 9, 10, 11, 12-FC, 14-C-i
*Pyrrhura orcesi***	T	900–1300	—	2, 4-FC-y
Forpus coelestis	T	600–1600	12-FC, 14-C	5, 7-R, 8, 10, 12-U, 14-FC
*Brotogeris pyrrhopterus**	T	(325)-1550	12-R, 14-C-c	2, 5, 6, 8, 10, 11, 14-C-c,i
Pionopsitta pulchra	C	(900)	—	4-R
Pionus sordidus		(1500)	—	2
P. chalcopterus		(325)–1450	—	2, 4-C, 5, 6
Coccyzus erythropthalmus		(325)–1300	—	2, 6, 14-R
C. lansbergi		(650)	—	14-R
Piaya cayana		600–1900	12-R, 14-R	4-U, 5, 6, 7-FC, 9, 14-R
Crotophaga ani		900–1000	—	4-L
C. sulcirostris		600–1800	12-L, 14-L	1, 4-L, 12-L, 14-L
Tapera naevia		(325)–1600	—	1, 2, 5, 7–U, 12–U, 14–R
Tyto alba		(1600)	—	12-R
Otus roboratus	T	600–1800	—	12-R, 14-R
O. albogularis		2500	13-R	13
Otus sp.		(900)	—	4-R
Pulsatrix perspicillata		(600)	—	14-R
Glaucidium brasilianum		600–1700	14-FC	5, 6, 8, 14-FC-na
Glaucidium sp.		1500–1700	12-U	12-R
Ciccaba sp.		600–1450	—	4-FC, 7-R, 14-R
Asio sytgius		(1400)	—	12-L
Nyctibius griseus		600	14-R	14-R
Nyctidromus albicollis		(325)–1700	12-L, 14-L	2, 4-L, 7-L, 8, 12-L, 14-L
Camprimulgus longirostris		(1400)	—	1
Chordeiles acutipennis		(600)	—	14-R
Streptoprocne zonaris		600–(2625)	12-R, 13-R, 14-R, 15	4-FC, 5, 6, 7-U, 13, 14-U

continued

	RR	AR	Aug–Sept 1989	Jan–Mar 1991
Cypseloides rutilus		900–(2625)	15	4-U, 5, 6, 7-U
Chaetura brachyura		600	—	14-U
C. cinereiventris		600–1300	14-FC	4-U, 6, 14-FC
Aeronautes montivagus		900–1850	—	1, 4-R
Phaethornis yaruqui		900–1000	—	4-U
P. syrmatophorus		1550–1800	12-U	12-U
P. griseogularis/longuemareus		1550–1800	12-U	12-U
Phaethornis sp.		900–1000	—	4-U
Eutoxeres aquila		900–1000	—	4-U
Colibri thalassinus		1700–2615	12-U, 13-U	—
C. coruscans		1700–2615	12-U, 13-U	9
Thalaurania colombica		900–1000	—	4-R
Amazilia amazilia		600–1800	12-FC, 14-FC	12-U, 14-FC
A. tzacatl		900–1450	—	4-U, 5, 6
Adelomyia melanogenys		1400–(2625)	12-U, 13-FC, 15	7-FC, 9, 12-U, 13
Heliodoxa jacula		900–1000	—	4-R-m
Patagona gigas		1800–2350	—	3
Lafresnaya lafresnayi		900–2500	—	13
Coeligena wilsoni	C	900–1450	—	4-R, 5
C. iris	A	1550–(2625)	12-R, 13-U, 15	9, 12-FC, 13
*Heliangelus strophianus**	C	900–1000	—	4-U
H. viola	A	1900–(2625)	13-U, 15	9, 13
Ocreatus underwoodii		900–1800	—	4-R, 7-R, 12-R
Lesbia nuna		2500	12-R	13
Aglaiocercus coelestis	C	900–1500	—	4-FC-nb, 6, 7-FC
Heliothryx barroti		900–1000	—	4-U
Heliomaster longirostris		(325)-1400	12-R, 14-U	2, 4-R, 5, 14-FC
Woodstar sp.		900–1800	12-U	1, 4-R, 6, 12-U
Myrtis fanny		1550–1750	—	12-R
Myrmia micrura	T	600–1450	14-U	6, 14-U
Pharomachrus auriceps		900–(2625)	12-R, 15	4-U, 7-U
Trogon melanurus		600–1800	12-U, 14-FC	12-U, 14-FC
T. personatus		900–2000	—	4-U, 7-U, 9
T. collaris		900–1800	—	4-R, 9
Ceryle torquata		600–1000	14-L	4-L, 14-L
Chloroceryle americana		600–1300	14-L	4-L, 12-L, 14-L
Electron platyrhynchum/ Baryphthengus martii		900–1000	—	4-U
Momotus momota		600–1800	12-R, 14-U	8, 12-R, 14-FC
Aulacorhynchus haematopygius		900–2000	—	4-U-y, 5, 6, 7-FC-fy, nf, 9
Pteroglossus erythropygius	C	350–1000	—	2, 4-R
Ramphastos swainsonii		900–1000	—	4-U
Picumnus sclateri	T	600–1800	12-FC, 14-U	7-R, 8, 12-U, 14-U
Piculus rivolii		(2500)	—	13
P. rubiginosus		600–1800	12-FC, 14-FC	4-FC, 5, 6, 7-U, 8, 12-R, 14-U
Dryocopus lineatus		650–900	14-U	4-R
Veniliornis fumigatus		900–(2625)	12-R, 13-R, 15	4-U, 5, 7-U, 9, 12-U
V. callonotus		(325)–1800	12-FC, 14-FC	2, 5, 8, 12-U, 14-FC

continued

	RR	AR	Aug–Sept 1989	Jan–Mar 1991
Campephilus gayaquilensis		600–1450	14-U	5, 6, 7-R, 14-R
Dendrocincla fuliginosa		900–1450	—	4-U, 6, 7-R
Sittasomus griseicapillus		600–1800	12–FC, 14-U	12-R, 14-FC
Glyphorynchus spirurus		900–1000	—	4-FC
Xiphocolaptes promeropirhynchus		650–2500	13-U, 14-U	5, 6, 12-R, 14-R-d
Xiphorhynchus erythropygius		900–1000	—	4-U
Lepidocolaptes souleyetii		(325)–1800	12-FC, 14-FC	2, 4-U, 12-U, 14-FC
L. affinis		1400–(2625)	13-FC, 15	7-FC, 9
Campylorhamphus trochilirostris		650–1700	12-R, 14-R	8
C. pusillus		(1600)	12-R	—
Furnarius leucopus		(325)–1700	12-FC, 14-FC	2, 4-U, 5, 7-R, 8-f, nf, 12-FC, 14-FC
Synallaxis azarae		900–(2625)	12-U, 13-U, 15	1, 4-FC-nf, 5, 6, 7-C, 9, 12-FC, 13
S. brachyura		900–1000	—	4-U
*S. tithys***	T	600–1000	14-U	14-FC
Cranioleuca antisiensis		900–(2625)	12-FC, 13-C, 15	2, 4-FC, 5, 7-C, 9, 12-FC, 13
Margarornis squamiger		1400–(2625)	15	7-R
Pseudocolaptes johnsoni		900–1000	—	4-U-y
P. boissoneautii		2500	13-U	13
*Syndactyla ruficollis***	T	600–(2625)	12-R, 13-FC, 14-U, 15	7-U, 8, 9, 12-FC, 13, 14-U
Anabacerthia variegaticeps		900–1450	—	4-U, 5
*Hylocryptus erythrocephalus***	T	600–1800	12-U	8, 10, 12-FC-i,m, 14-FC
Xenops rutilans		650–1800	12-R, 14-R	4-U, 7-U
X. minutus		900–1000	—	4-R
Taraba major		(325)–1700	12-R	2, 5
Sakesphorus bernardi	T	600–1800	12-FC, 14-FC	8, 10, 12-U, 14-FC-nb
Thamnophilus zarumae	T	600–(2625)	12-U, 13-FC, 14-R, 15	5, 7-U, 8, 9, 10, 12-U, 13
T. unicolor		900–1800	—	4-U, 7-U
Thamnistes anabatinus		900–1000	—	4-U
Dysithamnus mentalis		600–1400	14-R	4-U, 7-U
Myrmotherula schisticolor		900–1500	—	4-U, 5, 7-U
Myrmeciza immaculata		900–1800	—	4-R, 7-R
*M. griseiceps***	T	1000–(2625)	15	5, 13, 14-R
Formicarius rufipectus		900–1600	—	4-FC, 7-R
Grallaria guatimalensis		900–2500	—	4-FC, 6, 7-FC, 8, 9, 12-FC, 13
G. haplonota		900–1000	—	4-U
G. ruficapilla		1600–(2625)	13-R, 15	1, 7-FC, 8, 9, 12-FC, 13
G. watkinsi	T	600–2000	12-FC, 14-FC	5, 6, 7-U, 8, 10, 12-FC, 14-FC
Melanopareia elegans		600–1800	12-FC, 14-R	4-R, 8, 12-FC, 14-R
Scytalopus unicolor		2000–(2625)	13-R, 15	9, 13
Scytalopus sp.	T	900–1000	—	4-R

continued

	RR	AR	Aug–Sept 1989	Jan–Mar 1991
Phyllomyias uropygialis		(1600)	12-R	—
Zimmerius chrysops		900–2500	12-FC, 13-FC	4-U, 5, 7-FC-nf, 9, 12-FC
Camptostoma obsoletum		(325)–2500	14-FC	1, 2, 4-FC, 5, 7-FC, 8, 9, 12-FC, 13, 14-FC
Myiopagis subplacens	T	600–1750	12-FC, 14-FC	5, 8, 12-FC, 14-FC
Elaenia albiceps		2000–2500	—	9, 13
Elaenia sp.		(900)	—	4-R
Mecocerculus poecilocercus /stictopterus		1500–(2625)	15	2, 7-U, 9, 13
M. calopterus		650–1550	12-R, 14-R	5, 7-U, 14-R
Serpophaga cinerea		1000	—	4-L-m,y
Anairetes parulus		2500	13-R	—
A. nigrocristatus		2500	13-R	13
Euscarthmus meloryphus		600–1800	12-U, 14-U	1, 3, 4-R, 8, 12-U, 14-U
Mionectes striaticollis		900–1700	12-U	—
M. striaticollis/M. olivaceus		900–1700	12-U	4-U
M. oleagineus		(1700)	12-R	—
Phylloscartes sp.		900–1400	—	4-R, 7-R
Lophotriccus pileatus		900–1600	—	4-FC-y, 5, 7-U
Poecilotriccus ruficeps		(2500)	13-R	—
Todirostrum cinereum		900–2000	—	4-R, 5, 8, 9
Tolmomyias sulphurescens		600–1800	12-FC, 14-FC	12-U, 14-FC-nb
Platyrinchus mystaceus		900–1000	—	4-R
Myiotriccus ornatus		900–1000	—	4-FC
Myiobius sp.		900–1200	—	4-R, 5
Myiophobus flavicans		1200–1400	—	6, 7-U-m
M. fasciatus		600–1700	14-R	4-FC-m, 6, 7-FC,fy-nb, 8, 12-U, 14-FC
Contopus cinereus		600–1700	14-FC	8, 12-R, 14-U
C. fumigatus		900–(2625)	12-FC, 15	4-U, 6, 7-FC-nf, 8, 9, 12-U
*Lathrotriccus griseipectus***	T	650–1700	—	12-R, 14-U
Sayornis nigricans		(325)–1900	12-FC, 14-L	2, 4-L, 6, 7, 9
Pyrocephalus rubinus		600–1800	12-L, 14-L	1, 6, 10, 14-L
Ochthoeca rufipectoralis		(2500)	13-R	—
O. jelskii		2500–(2625)	12, 15	—
Myiotheretes striaticollis		1400–2500	12-U, 13-U	7-U, 13
Muscigralla brevicauda		800–1500	—	1, 10
*Attila torridus***	T	900–1700	—	4-R, 6, 7-U, 9
Myiarchus tuberculifer		900–(2625)	12-FC, 15	1, 4-U, 5, 6, 7-FC, 12-FC
M. phaeocephalus		600–1000	14-FC	14-U-c
Megarhynchus pitangua		(325)–1900	12-U, 14-FC	2, 4-U, 5, 6, 7-FC, 8, 9, 12-U, 14-FC
Myiozetetes cayanensis		(1500)	—	7-R
M. similis		600–2500	12-U, 14-U	4-U, 5, 7-U, 12-U, 13, 14-U

continued

	RR	AR	Aug–Sept 1989	Jan–Mar 1991
Myiodynastes maculatus		(325)–1900	14-R	2, 4-R, 5, 6, 7-U, 9, 14-U
M. bairdii	T	600–1700	14-U	8, 10, 14-U
M. chrysocephalus		(1500)	—	7-R
Legatus leucophaius		1200–1400	—	6, 7-U-d,m,nb
Tyrannus melancholicus		(325)–1900	12-R, 14-R	1, 2, 4-U, 5, 7-FC, 8, 9, 10, 12-FC, 14-R
T. niveigularis		(350)	—	11
Pachyramphus albogriseus		600–2500	14-U	5, 7-U, 13, 14-U
P. homochrous		(325)–1000	14-U	2, 14-FC-nb
Tityra inquisitor		900–1000	—	4-R
Ampelion rubrocristatus		1900–(2625)	13-U, 15	9, 13
*Ampelioides tschudii**		900–1500	—	2, 4-R, 7-R
*Cephalopterus penduliger**	C	(900)	—	4-R
Masius chrysopterus		900–1300	—	4-R, 5
Machaeropterus deliciosus	C	900–1000	—	4-U-d
Progne chalybea		(325)–2500	—	2, 4-U, 7-R, 9, 12-FC, 13
Notiochelidon cyanoleuca		(325)–2500	13-FC	1, 2, 4-FC, 5, 6, 7-FC, 9, 12-FC, 13
Stelgidopteryx ruficollis		(325)–900	14-R	2, 4-FC
Hirundo rufocollaris		600–2000	12-R	9-nb, 12-L-nb
Cyanocorax mystacalis	T	600–1800	12-FC, 14-FC	5, 12-FC-m, 14-FC
Campylorhynchus fasciatus		(325)-(2625)	12-C, 14-FC, 15	2, 4-R, 5, 6, 7-FC, 8, 12-C-nb, 14-C-nb
Thyrothorus mystacalis		900–1400	—	4-R, 5
T. sclateri		600–1600	12-U, 14-R	12-U, 14-U
T. nigricapillus		900–1000	—	4-U
Troglodytes aedon		(325)–(2625)	12-FC, 13-FC, 14-FC, 15	1, 2, 4-FC, 8, 9, 12-FC, 14-FC-m
T. solstitialis		(1700)	—	7-R
Henicorhina leucophrys		900–1900	—	4-U, 5, 6, 7-FC, 9
Cyphorhinus phaeocephalus		900–1000	—	4-R
Cinclus leucephalus		1000	—	4-L
Polioptila plumbea		600–1000	14-FC	8, 10, 14-FC
Myadestes ralloides		900–(2625)	15	4-U, 9
Catharus fuscater		1450–(2625)	15	7-FC, 9, 13
C. dryas		(1700)	—	7-R
C. ustulatus		900–1900	—	4-R, 5, 7-U, 12-U
Platycichla leucops		900–1900	—	4-U, 7-U, 9
Turdus chiguanco		1500–1800	—	3, 8-y, 12-U
T. fuscater		1200–(2625)	12-R, 13-FC, 15	1, 7-FC, 8, 9, 12-FC
T. serranus		1450–(2625)	13-R, 15	1, 7-U, 9, 12-U
T. nigriceps		1500–1800	—	8, 12-R
T. reevei	T	600–(2625)	12-FC, 14-FC, 15	8-m, 12-U, 14-FC-na
T. obsoletus		(900)	—	4-R

continued

	RR	AR	Aug–Sept 1989	Jan–Mar 1991
T. maculirostris	T	(325)–1900	12-FC	1, 2, 5, 6, 7-FC-fy,ny, 9, 12-FC, 14-FC
Mimus longicaudatus		600–1500	14-L	8, 14-L
Cyclarhis gujanensis		(325)–(2625)	12-FC, 13-FC, 14-FC, 15	1, 2, 5, 7-FC-m, 9, 12-FC, 13, 14-FC
Vireo olivaceus		(325)–1900	14-FC	2, 5, 6, 9, 14-U
V. leucophrys		600–(2625)	12-FC, 13-FC, 15	1, 4-U, 5, 6, 7-FC, 8, 9, 12-FC-d
Hylophilus decurtatus		900–1400	—	4-U, 5, 6
Parula pitiayumi		(325)–1800	12-FC, 14-FC	2, 4-FC-fy,y, 7-FC, 14-FC
Dendroica fusca		900–1800	—	4-FC, 7-FC, 9
Geothlypis semiflava		900	—	4-U
G. aequinoctialis		900–1500	—	1, 5, 6, 7–FC, 8
Myioborus miniatus		900–(2625)	12-FC, 13-FC, 15	1, 4-FC-nb, 5, 6, 7-FC, 9, 12-FC, 13
Basileuterus nigrocristatus		1900–(2625)	13-U, 15	9, 13
B. trifasciatus	T	900–(2625)	12-FC, 13-FC, 15	4-U, 5, 6, 7-C-nf, 8, 9, 12-FC
B. fraseri	T	(325)–1800	12-FC, 14-FC	2, 5, 8, 12-FC, 14-FC
Coereba flaveola		900–1800	—	4-U, 5, 6, 7-U
Euphonia cyanocephala		900–(2625)	12-R, 15	4-R, 7-U, 12-U
E. xanthogaster		900–1800	—	4-FC-y, 5-fy,y, 7-FC
E. laniirostris		(325)–(2625)	12-FC, 14-FC, 15	2, 4-U, 5, 6, 7-FC, 8, 9, 12-FC, 14-FC-nb
Conirostrum sitticolor		2500–(2625)	13-R, 15	13
Diglossa cyanea		2500–(2625)	13-C, 15	13
D. humeralis		2500–(2625)	13-U, 15	13
D. albilatera		2500–(2625)	13-U, 15	—
D. sittoides		1500–1800	12-U	—
Cyanerpes sp.		(900)	—	4-U
Chlorophanes spiza		900	—	4-U
Pipraeidea melanonota		900–1800	—	1, 4-U, 5, 6, 7-U-m
Tangara rufigula		900–1000	—	4-FC
T. arthus		900–1900	—	4-FC, 5, 6, 7-FC, 9
T. icterocephala		900–1300	—	4-U, 6
T. parzudakii		900	—	4-U
T. cyanicollis		(900)	—	4-R
T. rufivertex		900–1850	—	4-U-fy,y, 6, 7-R
T. gyrola		900–1400	—	4-FC, 5, 6
T. nigroviridis		900–1900	—	4-FC, 7-FC-m,nb, 9, 12-U
T. vassorii		1850–(2625)	13-FC, 15	12-R
T. viridicollis		1200–(2625)	12-U, 13-U, 15	6, 7-FC, 9, 12-U
Anisognathus flavinucha		1200–1900	—	6, 7-U-m, 9
A. notabilis	C	900–1000	—	4-U

continued

	RR	AR	Aug–Sept 1989	Jan–Mar 1991
Tersina viridis		(1000)	—	4-R
Thraupis episcopus		(325)–1900	12-FC, 14-FC	1, 2, 4-FC, 5, 6, 7-FC, 8, 9, 12-FC, 14-FC
T. palmarum		(325)–1600	—	2, 4-FC, 5, 6, 7-U
T. cyanocephala		1700–(2625)	12-FC, 15	7–R, 9
Ramphocelus flammigerus		(325)–1900	—	2, 4-FC-y, 5, 6, 7-FC, 9
Piranga flava		600–(2625)	12-FC, 14-FC, 15	4-R, 5, 6, 7-FC-nf, 9, 12-FC, 13, 14-FC
P. rubra		1450–1900	—	7-U, 9, 12-R
P. leucoptera		900–1600	—	4-R, 7-R
Chlorothraupis stolzmanni		900–1000	—	4-U
Thylpopsis ornata		1900–(2625)	13-U, 15	9, 13
Chlorospingus ophthalmicus		900–1450	—	4-FC, 5
C. canigularis		900–1200	—	4-U, 6
C. flavigularis		900–1000	—	4-U
C. semifuscus	C	900	—	4-U
Hemispingus melanotis		2500	13-FC	—
Conothraupis speculigera		(325)–1800	—	2, 5, 8, 12-R, 14-FC*
Catamblyrhynchus diadema		1700–2500	13-U	7-R, 13
Saltator maximus		(325)–1800	—	2, 4-FC, 5, 6, 7-FC-f
S. atripennis		900–1600	—	4-U, 7-U
S. nigriceps	T	1600–2500	12-U, 13-U	8, 12-U, 13
S. albicollis		600–1400	14-FC	5, 8, 7-U, 12-U, 14-FC
Pitylus grossus		900	—	4-U
Pheucticus chrysogaster		(325)–(2625)	12-FC, 14-U, 15	1, 2, 7-FC, 8, 9, 10, 12-FC, 14-FC
Volatinia jacarina		(325)–1800	12-FC	1, 2, 4-L, 5, 12-L, 14-L
Sporophila americana		(325)–1400	14-U	2, 4-L, 5, 6, 14-L
S. luctuosa		600–1200	—	4-L, 5, 14-L
S. nigricollis		900	—	4-L
S. peruviana		1000–1500	—	1, 2
S. simplex		(1500)	—	1
Oryzoborus angolensis		(900)	—	4-R-fy
Catamenia analis		1800–2350	—	3
Sicalis flaveola		600–1800	12-L, 14-L	2, 6, 7-L, 8, 10, 12-L, 14-L
Phrygilus plebejus		800–1800	12-FC	8, 10, 12-L
P. alaudinus		(1000)	—	1
Atlapetes rufinucha		1300–(2625)	15	5, 6, 7-FC-m, 9
A. tricolor		900–1000	—	4-U
A. leucopterus		1200–1800	12-FC	5, 7-FC, 8, 12-FC, 14-FC
A. seebohmi	T	1500–2500	12-FC	9, 12-U, 13
A. albiceps	T	800–1000	—	10, 14-U
A. torquatus		900–(2625)	12-FC, 13-U, 15	4-U, 5, 6, 7-FC, 8, 9, 12-U, 13

continued

	RR	AR	Aug–Sept 1989	Jan–Mar 1991
Arremon aurantiirostris		900–1000	—	4-U
A. abeillei		600–1800	12-FC, 14-FC	8, 12-U, 14-FC
Arremonops conirostris		900–1250	—	4-U, 5
Aimophila stolzmanni	T	800	—	10
Zonotrichia capensis		(325)–(2625)	12-L, 13-L, 15	1, 2, 3, 4-L, 7-L-nb, 8, 9, 12-L, 13
Molothrus bonariensis		600–1600	14-L	1, 7-L, 8, 10, 12-L, 14-L-nf
Psarocolius angustifrons		(2600)	12-R	—
Cacicus cela		650	14-U	14-U
C. microrhynchus		(325)–900	—	2, 4-U-nf
Amblycercus holosericeus		(1700)	12-R	—
Dives warszewiczi		600–1800	12-L, 14-L	4-L, 5, 7-L, 8, 9, 10, 12-L, 14-L
Icterus graceannae	T	600–1700	12-FC, 14-FC	14-U
I. mesomelas		600–1750	12-U	2, 4-R, 5, 7-U, 12-U
Sturnella bellicosa		(325)–1025	14-L	1, 3, 14-L
Carduelis magellanica		900–(2625)	12-L, 15	1, 4-L, 6, 7-L, 8, 9, 12-L
C. xanthogastra		900	—	4-R

On the validity of *Ceyx (Myioceyx) lecontei ruficeps*

by Robert W. Dickerman

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Peters (1945) recognized two subspecies of the tiny forest-dwelling, insect-eating Red-headed Dwarf Kingfisher *Ceyx* (*Ispidina* or *Myioceyx*) *lecontei*: nominate *lecontei* (type locality Moonda (=Mondah) River, Gaboon), and *ugandae* (type locality Budongo, Uganda). More recent authors (Mackworth-Praed & Grant 1970, Colston & Curry-Lindahl 1986, Fry *et al.* 1988, 1992) have not recognized geographic variation within the species. In attempting to identify a series of recently taken specimens from Liberia, it was necessary to reevaluate the available names for the species. These also include *Ispidina ruficeps* Hartlaub (type locality Akuapim, Ghana).

First it must be noted that the species is not well represented from West Africa in the ornithological collections of the world. Sharpe (1892) had but a single specimen (from Ghana), and the species was not reported from Liberia until 1986 when Colston & Curry-Lindahl reported on two specimens. Teams from the American Museum of Natural History have subsequently collected 14 specimens in Liberia (7 skins, 5 skeletons and 2 in liquid). The species is apparently locally common along small watercourses in undisturbed forested areas.

TABLE 1
Wing chord measurements of *Ceyx lecontei* populations east (*lecontei*) and west (*ruficeps*) of the Dahomey gap

	n	range	mean	s.d.
C. l. lecontei	53	(44) 45.5–50.5	47.8	1.3
C. l. ruficeps	8	44.0–46.0	45.4	0.7

Next, in view of the paucity of specimens it is not surprising that black-headed *lecontei* 1856 (based on the immature plumage) and red-headed *ruficeps* 1904 (based on the adult plumage) were recognized by Sharpe as distinct species. Thus when Bates (1911) reported on a series from Cameroon which included different age classes, *ruficeps* was relegated to the synonymy of first described *lecontei*. Latter *ugandae* was described as having ". . . more decided blue spots on the head than Gaboon and Fantee [Ghana] specimens".

Now with the recently taken series from Liberia and much larger series from throughout the species range (see specimens examined) it is possible to reevaluate the names available. Two populations are recognizable with classical distributions, one west and one east of the famous forest gap in Dahomey. Wing chord measurements were taken with dividers and were rounded to the nearest half millimetre. There is no sexual dimorphism in size, and so wing chord measurement data were combined. Nineteen males from Uganda had wings measuring 44–49 mm (mean 47.3, standard deviation 1.3), while eight females measured 46–50 (mean 48.4, standard deviation 1.5).

Ceyx (I am using this generic name following Fry *et al.* 1988, but without opinion on its use over *Myioceyx*) *lecontei lecontei* (with *ugandae* as a synonym) occurs east of the Dahomey gap. Its outstanding character is the presence of purplish-blue iridescent spots on the tips of the feathers of the crown (83% of 48 specimens), including three females from Gabon. In series the crown, venter and moustachial regions are slightly paler than in the very fresh Liberian series.

Ceyx lecontei ruficeps occurs west of the Dahomey gap; it lacks iridescent spots on the crown, and it is significantly smaller (see Table 1).

Specimens measured: *C. l. lecontei* (53). Cameroon 4 M, 1 F; Gabon 3 F; Central African Republic 4 M, 1 F; Zaire 4 M, 4 F; Angola 1 F; Uganda 19 M, 8 F; Sudan 1 M, 2 F. *C. l. ruficeps* (8): Liberia 4 M, 4 F.

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of the single adult male reported by Colston & Curry-Lindahl (1986) was used in the statistics.

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Some notes on type material of moas (Aves: Dinornithidae)

by Richard H. C. Bonser & Cyril A. Walker

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During a comprehensive recuration of the collection of Moa material in the Natural History Museum, South Kensington, certain discoveries were made concerning 'type' specimens. We here present a report of these findings.

Although the biological interest of these specimens, with their lack of collection data, is probably small, they do represent an important record of the sometimes confused history of moa systematics. They also illustrate some of the problems that can be associated with the type-based classificatory system. Recently some effort has been made to perform numerical analysis of morphometric data of the moa hindlimb. Cracraft's (1976) attempt is perhaps the most notable. Worthy (1988) has produced a key to the identification of hind-limb elements, which will undoubtedly prove a great aid to the curation of moa material. Anderson (1990) has published an extensive review of the ecology, morphology and history of moas which hopefully may excite increased interest in this fascinating group of extinct birds.

Dinornis maximus Owen

Lydekker's (1891) catalogue of fossil birds states that the collection contained casts of the syntypes of *Dinornis maximus*. Owen (1869) described the new species of moa on the basis of a syntypical series of the right tarsometatarsus, the left tibiotarsus, and the left femur. He stated that in March 1867 he was "favoured by Major J. Michael, of the Madras Staff Corps, with the opportunity of inspecting the femur, tibia and metatarse". The bones in the possession of Major Michael are described and figured by Owen (1869, 1879). The type locality is given as Glenmark Estate, 45 miles from Christchurch.

During the recuration it became evident that both the casts (BMNH no. A161) and the syntypical series of hindlimb elements were present in the collection. It is a matter of speculation as to the history of the bones over the last 130 years. Archey (1941) and Brodkorb (1955) both stated that the last known possessor of the types was Major Michael. It may simply be the case that they only made reference to Lydekker (1891) in reaching this conclusion. It is possible that the Museum purchased the collection some time after Owen's (1869) description, and due to the presence of the casts in the collection, the curator at that time saw no need to register the bones separately. Lydekker may simply have overlooked the bones.

***Pachyornis (Dinornis) elephantopus* (Owen)**

In 1856 Owen described a new species of moa based upon hindlimb elements from an assemblage of bones collected by Walter Mantell. The type locality was referred to as being a "vast rocky head" near Ruamoa ("Awamoa" in Archey 1941). The locality was said to be three miles south of Oamaru Point. within two years the collection of material had been purchased by the British Museum (Natural History) and Owen (1858a) published a complete description of the limb, in which it was figured. A mounted skeleton was then presumed to have been constructed which included the hind limb that Owen (1858a) had described. Owen (1858b) produced a description of the entire skeleton of *Dinornis elephantopus*. This skeleton was subsequently put on public display (BM(NH) no. A3620, ex. no.** [*sic*] in Lydekker 1891). Owen (1858b, 1879), Lydekker (1891), Lambrecht (1933) and Archey (1941) all referred to this mounted skeleton as being the 'type'.

Archey (1941) recognised the necessity to nominate a lectotype from the syntypical series of *Pachyornis elephantopus* (Owen). He chose the left tarsometatarsus of the mounted skeleton, which he assumed, for good reason, to be the same bone as that figured in Owen's (1858a) descriptions, and subsequently incorporated in the composite skeleton (see Lydekker 1891).

Whilst recurating the collection, the authors discovered that the left leg of the mounted skeleton did not correspond in detail to the elements figured by Owen (1858a). Briefly, the femur is less damaged in the region of the trochanteric ridge, and the tibiotarsus has neither the muscle scars nor the damage figured in the description. The tarsometatarsus differs in the configuration of the proximal foramen, lacks the two small foramina situated on the anterior surface of the shaft, and the articular surface of the third condyle is damaged. The authors feel that these differences are too great to be regarded as artistic licence, and hence conclude that the left hindlimb of the mounted skeleton is not that figured by Owen (1858a).

A search was made of the collection to determine whether the missing hindlimb was present: it was not found. Various scenarios could be proposed to explain its fate. It may not have been incorporated in the mount, but instead was retained by Mantell, to languish unrecognised, in another collection. Much of Mantell's material was given to the collection of the Royal College of Surgeons. Much of the material in this collection was destroyed by bombing during the Second World War. The material that survived was donated to the Natural History Museum.

If, as seems increasingly likely, Archey's (1941) lectotype is lost we are left with a nomenclatorial problem, as another specimen will have to be chosen from the syntypical series. The authors feel reasonably certain that the hindlimb of the mounted skeleton was part of the original collection, and can therefore be regarded as being part of the syntypical series. We have at present refrained from nominating a neotype, in the hope that searches by other curators may uncover the lost lectotype.

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The characteristics of the cosmetic soils used by Bearded Vultures *Gypaetus barbatus*

by David C. Houston, Allan Hall & Hans Frey

Received 3 December 1993

Bearded Vultures have a strikingly rufous colour to their head, neck and underparts, the intensity of which varies between individuals and localities. At one time these colour variations were used to establish new species (*G. albicans* Fatio, 1899) or subspecies (Fischer 1963). However, Berthold (1967) and Brown (1988) have shown that this colouration is caused entirely by the birds collecting iron-rich particles onto their feathers. The Bearded Vulture is the only bird species which is known to use cosmetic colouration from soils to such a spectacular effect. Clancey (1968), however, found it "*almost impossible to accept*" that such intense colouration was caused by iron staining, partly because no observations had ever been made of Bearded Vultures wallowing in red soils. His skepticism is understandable, for Brown (1988, 1990) during hundreds of hours of observations of Bearded Vultures during a three-year study in southern Africa never saw the birds using soil to stain the plumage. He considered that the birds may accumulate the colour incidentally, perhaps from filmy accumulations of iron oxide on rock ledges.

As a part of the programme to reintroduce the Bearded Vulture to the European Alps, a captive breeding programme has been established in Vienna and elsewhere, using birds from zoological gardens throughout Europe. Birds in captivity, if not given access to red soils, will develop pure white plumage. The captive birds have to be provided with red soils to develop their natural colouration. Captive birds only become excited when presented with certain intensely red-coloured soils, which are damp, but not liquid mud. They enthusiastically rub the belly and head feathers in the damp soil, and within an hour accumulate the characteristic deep, rufous colouration of wild birds. Once the feathers are stained in this way the colour cannot be washed out of the feathers by washing in water, although some soil is removed and the colour becomes fainter. The present paper considers the geological characteristics of the red soils which Bearded Vultures use for staining their feathers. We consider whether the distribution of suitable iron-rich soils may be limiting to the birds, or restricted in their locations, which might explain why birds have not been seen colouring their feathers in the wild.

Methods

Samples of soils were collected from a dolomitic limestone quarry beside the village of Groben, near Salzburg. They were subjected to X-ray diffraction analysis. The soils were first examined under a binocular microscope and the larger fragments were removed by hand, washed and mechanically ground in acetone to provide a glass-mounted smear for X-ray diffraction using Fe-filtered Co Kα radiation at scanning speed 2° 2θ/minute and range 4 to 64° 2θ. The remaining material was smear mounted for analysis. Finally the clay particles from the soil were obtained using a sedimentation method and allowing one-hour settling time before recovering by centrifugation, the fraction containing particles of less than 10 micron. The clay X-ray diffraction profile was obtained using 1° 2θ/minute and range 4 to 16° 2θ for a sample presented untreated, glycolated, heated for 1 hour at 300°C and 1 hour at 600°C. The clay material was subjected to X-ray micro-analysis on a Cambridge Instruments scanning electron microscope for identification of major elements of the atomic number of sodium or above.

Results

The coarse soil particles were mainly dolomite and calcite, as were the main soil particles, excluding the coarsest grains. The finest clay particles were made up mainly of 14 Å clay (chlorite) and 10-12Å clay (mixed-layer illite/smectite) with possibly some 7Å clay (kaolin). The chemical analysis of the fine clay particles gave Silicon 17 %, Aluminium 11.5%, Iron 10.5%, Calcium 8%, Potassium 2.5%, Magnesium 1.5%, Sodium 1%, Phosphorus 1% and Titanium 0.5%. The glycolation and heating at 300°C provided clear evidence of an expanding component in the 10-12 Å clay, hence this is interpreted as a mixed-layer illite/smectite clay. There was only a trace of goethite and possibly a trace of hematite in the clay fraction.

Discussion

The soils used by the birds were gravels derived from weathered dolomitic limestone, a rock which is not uncommon in the Alps region. The quarry near Groben has rocks of a rich orange-red colour, and these coloured dolomites occur in several other localities in the Alps, but sometimes only in very restricted areas. The soil is mud which is washed out of weathered rock fissures by rain, and there are only a few sites in the Alps where these iron-rich muds are known to occur, and they are the only red soils known in the region. It is thus very likely that suitable cosmetic sites are very restricted for Bearded Vultures. The mineral dolomite usually contains iron in its structure and has a general formula $Ca(Mg,Fe)(CO_3)_2$. The iron oxidises readily on weathering to produce brown ferric oxides/hydroxides. The red colour of the soil is due to these iron compounds. Hematite (Fe_2O_3) and goethite $FeO(OH)$ were both detected in trace amounts, but these minerals are often poorly crystallised and in partially hydrated states, so that their X-ray diffraction pattern is poorly developed, and they were probably more abundant than the results suggest; this is likely because of the high iron content from the chemical analysis. The main clay is a clay chlorite, but the illite/smectite which is also present would create a fine, absorbent material that has good adhesive properties for binding onto the feathers. Brown (1988) carried out electron microscope studies of the feathers which showed that the soils often formed large 'blobs' on the ends of the barbs, and some barbules were so thickly coated that they were bonded together in clumps. He found that the soil was particularly accumulated at the ends of the barbules were the keratin had become frayed. A clay component to the soil, as well as a high iron content, therefore seems necessary. Hence the soil material seems to be ideal as a cosmetic. It combines a high iron content, providing a rich red colour, with a fine clay to give excellent bonding properties onto the feather, so that the feather retains much of the colour even after rain or bathing.

Brown (1988) noted that in the wild the colour of birds was correlated with recent weather; after periods of heavy rain the birds were noticeably lighter, and after dry periods were darker in colour. This colour change may be caused by leaching, as Brown (1988) suggests, but could also be caused by changes in the frequency with which birds visit sites with cosmetic soils, because captive birds have been observed mainly to use the damp soils during dry weather.

Despite detailed and close observations of the twenty released Bearded Vultures in the Alps over seven years, no bird has ever been seen using these red soils in the wild. The birds are provided with soil from the Groben quarry at their release sites. But it is known that some birds have found natural sources of mud—it is not known where—from which they have returned with their feathers thickly coated. Captive birds are extremely wary when using the soil, and will stop immediately there is any disturbance. From the lack of field observations anywhere in the world it is likely that birds in the wild are also very secretive about their visits to mud wallows.

Bearded Vultures are widely distributed over a great range of mountains of different geological origins. The populations in the Himalayas, Pyrenees and the Alps are all in limestone regions, where the soil type described here could develop wherever dolomitic limestone is eroding and weathering. The populations in Africa, which belong to a separate subspecies *G. b. meridionalis*, occupy the mountain areas of Ethiopia, East Africa and Lesotho and southern Africa. These mountains are composed of much older, metamorphic rocks. The characteristics of the soils used by birds in these areas must be different from the soil type described here, but African soils are characterised by high iron oxide contents, and sources of suitable cosmetic soils may be far more abundant. Brown (1988) carried out X-ray diffraction analysis of feathers and soil washed from feathers taken from birds in Lesotho. The material was found to be poorly crystalline, amorphous to X-rays, and probably a hydrous oxide of iron.

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IN BRIEF

MAGGOTS IN THE DIET OF THE COLLARED DOVE

Columbids in general are granivorous. Small snails are, however, regularly eaten during the breeding season as a source of calcium (e.g. Murton *et al*. 1964; *Ibis* 106: 174–188), and several genera, including *Streptopelia*, have been recorded eating other invertebrates (Goodwin 1970, *Pigeons and Doves of the World*). I report here the consumption of maggots by Collared Doves *Streptopelia decaocto*.

While studying the ecology of the Collared Dove near Ludhiana, I collected 206 birds for analysis of their gut contents, 10–20 in each month. None of the birds collected in 11 months of the year contained any insects. In July, however, 2 out of 16 (collected on 19 and 31 July 1985) had their crops full of maggots which were visible through the transparent skin of the crop. In one of them about 25% of the maggots were alive, and started moving about as soon as the crop was opened; they were alive probably because the bird was dissected immediately after being shot during the doves' peak feeding period (07.00–09.00 hrs). In the gizzards of both birds there were semi-digested maggots, their bodies hollow with the cuticle intact. Other food items present in small amounts in the guts of these doves were maize (1.09% by weight), wheat (0.29%), weed seeds (0.72%) and grit (5.80%); maggots formed the remaining 92.1%. Both birds were adult males in normal healthy condition, with no wounds or infections which might have accounted for the maggots. Collared Doves were often seen probing organic manure added to the fields, and also cattle dung kept in manure pits, and it is probable that the maggots were obtained in this way. In other doves whose gut contents were analysed, grain recovered from the crops sometimes had bits of dung attached.

The food of Collared Doves in this area (Saini & Toor 1994, in *Granivorous Birds in Polluted Environments*; PWN, Warsaw) is composed of seeds of cultivated and wild plants (85%) and grit (15%). Animal matter, especially snail shells, forms only <1% of total food. The recorded unusual intake of animal matter in the diet in July coincides with the period of food scarcity for doves. In my study area, there are two main crop seasons, viz. *rabi* (November–December to March–April) and *kharif* (June–July to October–November). Major *kharif* crops (rice, maize and pulses) are sown by the end of June and after sprouting become unavailable to doves. Saini & Toor (*loc. cit.*) reported that weed seeds formed the main part (53%) of the diet of doves in July, and attributed it to the unavailability of other crop seeds in this area.

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BOOKS RECEIVED

World Conservation Monitoring Centre. 1993. *World Checklist of Threatened Birds*. Pp. xiii+308. Joint Nature Conservation Committee, Peterborough (available from Natural History Book Service Ltd., 2 Wills Road, Totnes, Devon TQ9 5XN). ISBN 1-873701-45-4. £26. 30 × 21 cm.

This is the 3rd edition of one in a series of volumes (the others cover other animal groups) prepared for the U.K.'s Scientific Authority for Animals to assist in implementing the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). For each species the range (breeding, non-breeding and vagrant) is given, its "threat category" (endangered, vulnerable, insufficiently known, etc.), and key references (by number, referring to a numbered list of 1559 references which itself constitutes a useful compilation of recent literature).

Sibley, C. G. & Monroe, B. L., Jr. 1993. *A Supplement to Distribution and Taxonomy of Birds of the World*. Pp. vi+108. Yale University Press. ISBN 0-300-05549-8. £19.95. 29 × 22 cm.

After publication of their monumental *Distribution and Taxonomy* . . . (for review, see vol. 111: 110–112), the authors requested suggestions for improvement or correction. The response was "extensive and gratifying"; the present supplement is the result. It is in two parts: a short section (13 pages) containing changes in systematics that affect classification or scientific names, and the main section containing a variety of other changes to the text. Apart from some name changes for higher categories, the changes affect lower taxonomic levels, mainly species and superspecies; the still controversial revolutionary classification, based on DNA–DNA hybridization, is unchanged. Anyone owning the main work should have this supplement, which is of the same design and general format, but soft-covered.

Monroe, B. L., Jr. & Sibley, C. G. 1993. *A World Checklist of Birds*. Pp. xix+393. Yale University Press. ISBN 0-300-05547-1. £35. 26 × 18 cm.

A species-level checklist, based on the classification set out in the Sibley & Monroe *Distribution and Taxonomy of Birds of the World* and its supplement (see above). There is a line for each species, giving scientific and English name, a very brief statement of range, and a space for the reader's note(s). Taxa not admitted by the authors as species but considered so by others, i.e. borderline cases, are listed under the relevant species heading. There are two indexes, totalling 57 pages, of generic and English names. This is probably the most complete avian species list of handy size that makes some (limited) allowance for MS notes and additions according to the user's needs.

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EDITED BY

Dr D. W. SNOW

Volume 113
1993

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LIST OF AUTHORS AND CONTENTS

INDEX TO SCIENTIFIC NAMES
(Compiled by Mary N. Muller)

All generic and specific names (of birds only) are indexed. New subspecific names are indexed in bold print under generic, specific and subspecific names.

CORRECTIONS TO TEXT

Page 2, line 48: *Nesopiza* not *Neospiza*
Page 15, line 21: *Thamnophilus* not *Thamnopilus*
Page 15, line 42: *Mionectes* not *Mionectus*
Page 17, line 27: *schlegeli* not *schegeli*
Page 24, line 46: *furcifer* not *furcatus*
Page 74, line 30: *Anabacerthia* not *Anabercerthia*
Page 106, line 20: *ruficeps* not *rificeps*
Page 106, line 36: *Thryothorus* not *Thyrorthorus*
Page 107, line 26: *Thlypopsis* not *Thylpopsis*
Page 159, lines 34 & 41: *cyanouroptera* not *cyanuroptera*
Page 160, lines 6 & 18: *cyanouroptera* not *cyanuroptera*
Page 162, line 31: *cyanouroptera* not *cyanuroptera*
Page 164, lines 10, 15 & 27: *cyanouroptera* not *cyanuroptera*
Page 189, line 39: *coelebs* not *caelebs*
Page 211, line 35: *Empidonomus* not *Emipidonomus*
(Page 233: blank page due to faulty arrangement of papers; no material omitted)
Page 238, line 21: *ruficervix* not *rufivertex*
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Page 253, line 39: *leucocephalus* not *leucephalus*
Page 254, line 15: *Thlypopsis* not *Thylpopsis*

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Bulletin of the

British Ornithologists' Club

Edited by
Dr D. W. SNOW

Volume 114 No. 1 March 1994

FORTHCOMING MEETINGS

Tuesday, 19 April 1994. John Wyatt J.P. will speak on "Birds of Eastern Poland". John Wyatt is a naturalist, writer and photographer. He leads wildlife tours in Europe and Africa and has a particular interest in Poland. He was formerly a Deputy Director of Development of the British Trust for Onithology.

Those wishing to attend are asked to notify the Hon. Secretary by Tuesday, 5 April 1994.*

A second Club Visit to The Natural History Museum at Tring, for those members who were unable to join the visit in June last year, has been arranged for Friday 22 April 1994.

Those wishing to attend are asked to contact the Vice-Chairman, the Reverend T. W. Gladwin, 99 Warren Way, Digswell, Welwyn, Hertfordshire AL6 0DL (tel. 043 871 4700) as soon as possible.

Tuesday, 24 May 1994. Annual General Meeting at 6 p.m. followed by the evening meeting when **Dr Peter Lack will speak on "Birds and Farming".** Dr Lack completed field studies in East Africa on bird communities in Tsavo National Park for his doctorate and has undertaken other field studies overseas. He is presently the Computer Officer of the BTO. He is the compiler of *The Atlas of Wintering Birds in Britain and Ireland* and is the author of the recently published *Birds of Lowland Farms*. His talk will incorporate his own (published and unpublished) and other recent BTO work.

Those wishing to attend are asked to notify the Hon. Secretary by Tuesday, 10 May 1994.*

Tuesday, 19 July 1994. Mr Richard ffrench, author of *The Birds of Trinidad and Tobago*, will speak on "Sounds of Birds in the Neotropics".

Tuesday, 20 September 1994. We are delighted to welcome back **Dr Storrs Olson** who will speak on **"Seabirds of the North Atlantic through 20 Million Years".**

Meetings are held in the Sherfield Building of Imperial College, South Kensington, London at 6.15 p.m. for 7 p.m. A map showing Imperial College will be sent to members on request.

*Late acceptances and cancellations can usually be taken up to the Thursday morning preceding a meeting, although members are asked to accept by 14 days beforehand as arrangements for meetings have to be confirmed with Imperial College well in advance.

If you accept and subsequently find you are unable to attend please notify the Hon. Secretary, 1 Uppingham Road, Oakham, Rutland LE15 6JB (tel. 0572 722788) as soon as possible as the booking can often be offered to another member.

Bulletin of the BRITISH ORNITHOLOGISTS' CLUB

Vol. 114 No. 1 Published: 30 March 1994

REPORT OF THE COMMITTEE FOR 1993

Meetings. Eleven meetings were held in 1993. Ten evening meetings with a buffet supper were held at Imperial College; nine in the Ante-room of the Sherfield Building and the September meeting in the pleasant surroundings of the Rector's House, at 170 Queensgate. In June a Club visit was made to the Sub-department of Ornithology of The Natural History Museum, at Tring. Members were able to enjoy the excellent display of exhibits, some of particular interest to the Club, and were given a comprehensive insight into the working of the Museum. (A full account of this visit has appeared elsewhere in the *Bulletin*.) The Club is especially grateful to Mr Iain Bishop and Dr Robert Prŷs-Jones of The Natural History Museum for organising the visit.

A total of 402 members and guests attended these meetings, a similar number as for meetings in each of the last 5 years, excluding the particularly high attendances of the 800th meeting, the meeting at the I.O.C. in New Zealand and the Centenary Dinner.

During 1993 the programme of expert speakers presented a diversity of subjects at meetings, and it was with particular pleasure that the Club was able to welcome Abbé René de Naurois, Professor Charles Pilcher and Dr Geoffrey Davison during their visits to Britain.

Committee. The Committee met 7 times in 1993 and the average attendance was 78%.

The Committee has implemented the proposal, outlined in last year's Report, to use the income generated by the Herbert Stevens Fund to finance additional publications particularly concerned with taxonomy and systematics, which institutions in this country are unable to fund. Number one of a series of *Occasional Publications*, edited by Dr J. F. Monk, *Extinct and Endangered Birds in the Collections of The Natural History Museum* by Alan Knox and Michael Walters, will be published in April 1994. The Club gratefully acknowledges a loan of £1000 towards the cost of its production from the Bird Exploration Fund.

Arrangements are in hand to continue to complete the stock of back numbers for all years.

Deaths. It is with regret that the Committee reports the deaths of P. J. Conder O.B.E. (*Member 1952–1993, Committee 1982–1985*), N. R. Fuggles-Couchman (*Member 1991–1993*) and K. D. Pickford (*Member 1948–1993*).

Membership. Paid up membership at 31 December 1993 was 574, 347 members with U.K. addresses and 227 with addresses overseas. There were 20 new members in 1993; 3 members who were in arrears became paid up. 12 members resigned and 28 failed to pay their subscriptions.

The drop in membership noted in 1992 continued in 1993, perhaps reflecting the continued unfavourable economic climate. A new recruitment leaflet has been produced and is being sent to each new member elected to the Union.

Bulletin Sales. Non-member Subscribers were 128, 22 in the U.K. and 106 overseas. Four new subcriptions were taken out but 23 Subscribers in 1992 failed to renew their subscriptions. The reduction in the number of Subscribers was noted in the Report of the Committee in 1991 and has also been noted by other learned societies. A new Subscribers' leaflet is being prepared and a mail shot is planned for 1994.

The Committee records its thanks again to Mrs F. E. Warr who continues to look after the stock of back-numbers of the *Bulletin*, dealing with their despatch and with that of separates for authors.

Bulletin. Volume 113 consisted of 264 pages, and contained 38 papers and 9 shorter (In Brief) contributions. Papers included descriptions of 7 new subspecies, 6 Neotropical and 1 Afrotropical. New distributional data were published for China, New Guinea, and 2 Central and 4 South American countries. Among a variety of papers of ecological or behavioural interest may be mentioned a study of the extinction of the Glaucous Macaw, linking it to its dependence on a few species of palms whose fruit were suited to its bill size; the fullest account so far available of the behaviour and display of the spectacular Crimson Fruitcrow of Amazonia; an account of a very high-altitude avifauna in a little known part of New Guinea; and a detailed account of some aspects of the behaviour and ecology of Cobb's Wren of the Falkland Islands, suggesting that it may deserve specific status. A long paper, published in two parts, added very significantly to knowledge of the seriously threatened and highly endemic avifauna of the border region between northwestern Peru and southwestern Ecuador. Another paper of special interest threw new light on the origin of the cosmetic colouration of the plumage of the Bearded Vulture, now being re-introduced into the Alps, and its dependence on particular geological deposits. There was the usual variety of papers dealing with points of distribution, taxonomy and nomenclature. The 70 contributors were from 14 countries and 5 continents.

Finance. Receipts from Club publications and goods continued at a satisfactory level, including the sale of 71 copies of *Avian Systematics and Taxonomy* and 31 copies of *Birds, Discovery and Conservation.*

Interest rates on the Club's ordinary funds continued to fall during the year, income from these sources now being significantly reduced from that of recent years. The Giro account was closed in the fourth quarter, and the Lloyds current account will be closed in January 1994, reducing future bank charges.

The Trustees of the Herbert Stevens Fund have been managing the monies arising from the sale of the property at Tring for almost one year. The original sum handed to those Trustees was £144,953, which had grown to £162,632 on the basis of 'bid' (i.e. selling) price by the year end. Income earned during the year amounted to £6086, after the reclamation of Income Tax, and it is estimated that the income will be £6329 in a full year.

The Accounts for 1993, which are not yet available, will be tabled at the Annual General Meeting and published subsequently in the *Bulletin*. Members wishing to have copies before the Annual General Meeting are asked to apply to the Honorary Treasurer.

ANNUAL GENERAL MEETING

The Annual General Meeting of the British Ornithologists' Club will be held in the Ante-room, Sherfield Building, Imperial College, London SW7 at 6 p.m. on Tuesday, 24 May 1994.

AGENDA

1. Minutes of the 1993 Annual General Meeting (see *Bull. Brit. Orn. Cl.* 113: 129–130).
2. Report of the Committee and Accounts for 1993.
3. The *Bulletin*.
4. The election of Officers. The Committee proposes that:-
   (i) Mr S. J. Farnsworth be re-elected Honorary Treasurer.
   (ii) Mrs A. M. Moore be re-elected Honorary Secretary.
   (iii) Miss H. Baker be elected member of the Committee (*vice* Cdr. M. B. Casement, O.B.E., RN (Retd) who retires by rotation).
5. Any other business of which notice shall have been given in accordance with Rule (12).

By Order of the Committee
AMBERLEY M. MOORE, *Honorary Secretary*

The eight hundred and thirty-third meeting of the Club was held on Tuesday, 19 October 1993 in the Ante-room of the Sherfield Building, Imperial College, South Kensington at 6.15 p.m. 21 Members and 14 Guests attended.

Members attending were: The Rev T. W. Gladwin (*in the Chair*), Dr C. F. Mann (*Speaker*), M. A. Adcock, Cdr. M. K. Barritt RN, K. F. Betton, P. J. Bull, D. R. Calder, Dr M. J. Carswell, Cdr. M. B. Casement RN Retd., J. H. Elgood, S. J. Farnsworth, A. Gibbs, R. H. Kettle, Dr J. F. Monk, Mrs A. M. Moore, R. G. Morgan, Mrs M. Muller, R. E. F. Peal, Dr N. J. Skinner, N. H. F. Stone, K. V. Thompson.

Guests attending were: Mrs B. Adcock, Mrs J. Calder, G. Dutson, Mrs F. Farnsworth, R. Frankum, Mrs W. Frankum, Mrs J. Gladwin, J. B. Heigham, Mrs P. Heigham, Mrs D. Monk, P. J. Moore, Mrs A. Nason, R. Ranft, R. Wilkinson.

Dr Clive Mann, who is working on a B.O.U. checklist of the area, spoke on the avifauna of Borneo. He opened his address with a brief overview of the geography, geology, topography and climatic conditions of the Bornean realm. This was followed by a short illustrated account of the main habitats. The last section of the address was a very brief summary of the birds by systematic group, with an emphasis on endemics. The total avifauna comprises a little over 600 species. This was accompanied by bird songs on tape, and slides of birds, mostly in the hand.

A nest of the Sunda Frogmouth *Batrachostomus cornutus* was shown to the members as an illustration for an anecdote about the unfortunate experiences of a pair of that species.

The eight hundred and thirty-fourth meeting of the Club was held on Tuesday, 2 November 1993 in the same place at 6.15 p.m. 25 Members and 5 Guests attended.

Members attending were: D. Griffin (*Chairman*), R. P. Martins (*Speaker*), M. A. Adcock, Miss H. Baker, Mrs D. Bradley, D. R. Calder, Dr M. J. Carswell, Professor R. Chandler, Dr R. A. Cheke, S. J. Farnsworth, A. Gibbs, I. T. Lewis, Dr J. F. Monk, D. J. Montier, Mrs A. M. Moore, R. G. Morgan, J. G. Parker, R. E. F. Peal, R. C. Price, Dr R. Prŷs-Jones, R. E. Scott, Dr D. W. Snow, N. H. F. Stone, A. R. Tanner and Mrs F. E. Warr.

Guests attending were: Mrs B. Adcock, Mrs F. Farnsworth, Mrs S. Lewis, Mrs M. Montier and Mrs A. Scott.

The subject of Mr Martins talk after supper was "Where are the limits of the Western Palearctic?". After pointing out that little recent attention has been given to the eastern limits of the western Palearctic (admitted by the editors of *Birds of the Western Palearctic* to be "largely arbitrary"), he discussed in most detail the situation in the Middle East, where there is a good case for including almost the whole of the Arabian peninsula, and the Zagros and Elburz mountain ranges of Iran, in the western Palearctic. A full discussion of these and other conclusions is in preparation.

Undescribed taxa and new records from the Fakfak Mountains, Irian Jaya

by David Gibbs

Received 21 November 1992

The Fakfak Mountains on the Onin Peninsula in southwest Irian Jaya are one of the ornithologically least known areas in New Guinea. Doherty and Schädler collected there in 1896 and 1897 but did not reach high elevations and collected just 10 montane species (Diamond 1985). Diamond spent several weeks in these mountains in 1981 reaching an altitude of 1290 m. Although he added greatly to our knowledge of the birds of this range he did not reach the highest altitudes, so many montane species remained undiscovered. The lack of exploration is largely due to the extremely inhospitable nature of these limestone mountains. There is almost no accessible water more than a couple of kilometres inland and the terrain is very steep and broken. Vertical cliffs, sheer-walled fissures and deep sink-holes are frequent features of the landscape. The human population of the Fakfak is very low and almost entirely confined to the coast; the mountains are uninhabited and trackless. The local inhabitants do not even venture more than 4–5 km into the hills to hunt.

However in 1991 oil exploration teams cut numerous trails right across the peninsula from coast to coast, building helipads at approximately every 2½ km. Most important, 44-gallon oil drums have been left at the helipads and allowed to fill with rain-water, facilitating travel in these mountains without mounting a large expedition. The cut-line heads straight across the mountains, but wherever sheer cliffs or very broken country is encountered, detour trails have been cut. The helipads provide wonderful camp sites with a superb view of the surrounding forest. From 31 August to 7 September 1992, I birded in these mountains, using the new trails, and recorded 117 species, some of which represent quite distinct, undescribed taxa.

From the coastal town, Kota Fakfak, we travelled by dugout to Worsaret, a tiny village about 2 hours east of town. Close to Worsaret is the southern end of 'cut-line Hotel', which I intended to follow to the watershed. With two porters from Worsaret, I set off for my week-long trek. After half an hour's walking we left the cleared area around the village and soon after entered undisturbed forest at about 100 m. The first night we camped at Helipad 2 at about 600 m. The second day we walked for 10 hours to cover the 6 km to Helipad 4 at about 1200 m, where I stayed for two nights. On day 4 we walked for 7 hours to cover 3 very difficult and exhausting kilometres to Helipad 5 on the north side of the watershed at about 1500 m. The summit, about two hours before Helipad 5, is at approximately 1600 m. From here I returned to Worsaret spending another night each at Helipads 4 and 2. Unfortunately I did not have an altimeter with me, so the heights given above are very rough estimates.

My main reason for visiting the Fakfaks was to search for the Greater Melampitta *Melampitta gigantea* which had been discovered here by Diamond in 1981 (Diamond 1983). Unfortunately I failed completely to locate the species, not even hearing anything fitting Diamond's description of the call. The Worsaret villagers were not familiar with the Melampitta. This species was considered locally common near Wanggasten by Diamond, just 20 km east of 'cut-line Hotel'. Its absence here may be due to inadequate sink-holes and fissures at the right altitude, although some were present along much of the trail and the area between Helipads 4 and 5 seemed ideal. Alternatively, if the bird is silent at this time of year, it would be almost impossible to locate. It seems likely that this rare bird has very specialised requirements even within the limestone terrain to which it is certainly confined.

Generally the birding in this remote area was very rewarding. The most striking characteristic of the avifauna was its confiding behaviour. Throughout most of New Guinea, where birds have been heavily hunted for thousands of years, getting good views of birds (or even seeing them at all) can be exceedingly difficult. In the Fakfak most passerines and even pigeons and raptors were readily attracted by squeaking or by an imitation of their call, and would perch close by apparently quite unperturbed by human presence. Even the Southern Cassowary *Casuarius casuarius* only reluctantly walked away from me. Many species were also more abundant than I am accustomed to experiencing elsewhere in New Guinea. A number of the species listed below clearly belong to undescribed races and some may merit specific status. Several of these taxa were noted by Diamond in 1981 but a few are entirely new records. My brief visit indicates that these much neglected hills deserve the attention of a proper ornithological expedition.

Taxonomy and nomenclature of the following list follow Sibley & Monroe (1990).

Potentially new taxa

SCLATER'S WHISTLER *Pachycephala soror*

Frequent from Helipad 4 to the summit. These birds belong to an unnamed race (Diamond 1985) and are quite different from the nominate; head of male paler and greyer and breast-band very thin and not always obvious.

LEMON-BREASTED BERRYPECKER *Melanocharis longicauda*

A few seen associated with feeding flocks between Helipads 4 and 5. The birds here are quite distinct from those of the Arfak and Central Ranges. Underparts are satiny-white rather than grey, more or less washed with lemon-yellow on throat and breast and with lemon-yellow pectoral tufts.

HONEYEATER *Ptiloprora* sp.

A honeyeater of this genus was seen daily in small numbers, mostly above Helipad 4. The only members of the genus known from the Fakfak Mountains are *P. erythropleura* and perhaps *P. plumbea*. The latter is a small species, unstreaked below and thus readily eliminated as a possibility. The birds I saw differ from *P. erythropleura* of the Arfak in their larger size, distinct streaking on the underparts and complete lack of rufous plumage on the flanks or elsewhere. Pectoral tufts rather yellowish. Iris of at least some individuals appeared pale. Call typical of the genus, *pee-yooee*. Overall these birds were more reminiscent of the Grey-streaked Honeyeater *P. perstriata*. *Ptiloprora* honeyeaters observed by Diamond (1985) in the Fakfak and Kumawa Mountains were presumably the same as I have described above. As no specimens have been trapped or collected the identity of these birds must remain undetermined.

HONEYEATER *Melipotes* sp.

Another very distinct and, as yet, undescribed form. Diamond (1985) tentatively placed these birds with *M. fumigatus* on the basis of three sightings. To me the plumage of these birds appeared closer to *M. gymnops* being pale, off-white on belly and undertail coverts but lacking the dark streaking of that species. However the yellow/red eye skin differs from both these species being very similar in structure to that of *M. ater* of the Huon Mountains. Below and just behind the eye the bare skin is produced into a long 'ear' such that in profile the 'ear' on the opposite side of the head to the observer is easily visible. I have not observed such a striking elongation of the eye wattle in any race of either *M. fumigatus* or *M. gymnops*. In the field this undescribed bird appears to be as distinct from both *M. fumigatus* and *M. gymnops* as they are from each other. The possibility that it represents a fourth allospecies in the *Melipotes* complex is worth investigation.

(VOGELKOP) BOWERBIRD *Amblyornis ? inornatus*

Frequently heard and seen between Helipads 4 and 5. Several bowers seen. Currently this population is assigned to *A. inornatus*

(Beehler *et al.* 1986, Sibley & Monroe 1990). However, as described by Diamond (1984, 1985), the birds of the Kukmawa and Fakfak Mountains construct a quite different type of bower. The Arfak, Tamrau and Wandammen birds build large, elaborate hut-like bowers 1 m high and 1.6 m in diameter with a wide door along one side and a lawn of moss decorated with fruits, flowers, leaves and, often, any rubbish of the right colour (Fig. 1a). Orange, blue and black items are selected, each being placed in discrete piles. Fakfak and Kumawa birds build a bower of the maypole type with a central column of sticks built around a sapling to a height of about 2 m (Fig 1b). Sometimes a subsidiary column is built around an adjacent sapling, coverging with the main one above. At the base of the main column a mat of black fibrous roots, about 1 m in diameter, covers the ground. This mat is built up around the base of the column but no raised perimeter ring is present. Bowers were ornamented outside the mat of roots with discrete piles of large gastropod shells all of the same species and of much the same size, black bamboo leaf sheaths and small white limestone rocks. The latter, so the Worsaret villagers informed me, are only to be found in wells. As water is very scarce in these limestone hills, such stones are rare items for which the birds must travel far.

The Fakfak birds look very like those of the Arfak, but are slightly darker above and more fulvous below. So similar are they that these two populations have not even been separated as races. However, it is impossible to believe that so elaborate and time consuming a structure as a bower is not a far more significant genetic isolator than any features of plumage or song in this genus. The behaviour of the male and, by inference, the preferences of the females, have surely diverged too far for these two populations to be considered conspecific.

(LONG-TAILED) PARADIGALLA *Paradigalla ? carunculata*

Two birds, presumably this species, were seen close to the highest altitude reached between Helipads 4 and 5. No representative of this genus has previously been found in either the Fakfak or the adjacent Kumawa Mountains. Both birds differed from *P. carunculata* in the very much paler yellow/white facial wattle; more swollen, paler blue malar wattle; lack of red malar wattle (this is often not visible in Arfak *P. carunculata*) and shorter, square-cut tail extending just 3–4 cm beyond the wing tip (Fig. 1, c–e). This approximates to half the length of the graduated tail of typical *P. carunculata*. No vocalisations were heard. These birds are clearly an undescribed taxon which seems to be intermediate between *P. carunculata* and *P. brevicauda* and I have only presumed them to be the former from their range. Whether this population is conspecific with one of the above species or constitutes a separate species will only be answered by further research. The existence of an intermediate form may suggest that the two known paradigallas are the extreme ends of a cline within a single species.

Other species recorded inland

SOUTHERN CASSOWARY *Casuarius casuarius*. One seen between Helipads 2 and 4. Still common here from the beginning of the forest above Worsaret almost to the altitude of Helipad 4.

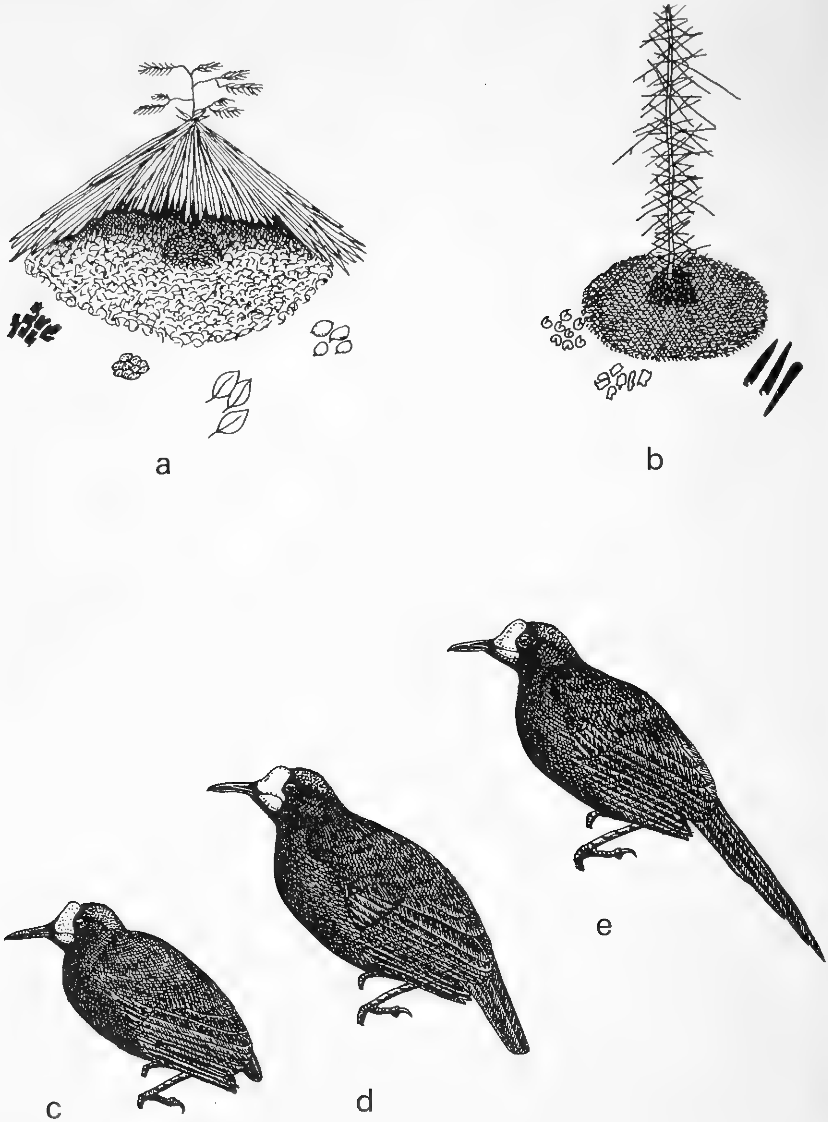

Figure 1. (a) Bower of Vogelkop Bowerbird *Amblyornis inornatus*; Arfak Mountains. (b) Bower of bowerbird *Amblyornis* sp.; Fakfak Mountains. (c) Short-tailed Paradigalla *Paradigalla brevicauda*; Central Ranges. (d) *Paradigalla* sp.; Fakfak Mountains. (e) Long-tailed Paradigalla *P. carunculata*; Arfak Mountains.

LONG-TAILED HONEY-BUZZARD *Henicopernis longicauda*. One at Helipad 4.
GREY GOSHAWK *Accipiter novaehollandiae*. One white-phase bird seen at Helipad 5.
GREY-HEADED GOSHAWK *Accipiter poliocephalus*. One at Helipad 4.
SLENDER-BILLED CUCKOO-DOVE *Macropygia amboinensis* A few seen and heard between Helipads 2 and 4.
BLACK-BILLED CUCKOO-DOVE *M. nigrirostris*. Frequent from Helipad 2 to the highest altitude reached.
GREAT CUCKOO-DOVE *Reinwardtoena reinwardtsi*. Singles seen from Helipad 2 to the highest altitude reached.
STEPHAN'S DOVE *Chalcophaps stephani*. Singles seen between Helipads 2 and 4.
WESTERN CROWNED-PIGEON *Goura cristata*. Two flushed up 2–3 km inland.
WOMPOO FRUIT-DOVE *Ptilinopus magnificus*. Heard in lowlands between Worsaret and Helipad 2.
ORNATE FRUIT-DOVE *P. ornatus*. Frequent from Helipad 2 to 4. These birds belong with one of the yellow-capped races (presumably *P. o. kaporensis*) and not with the purple-capped nominate of the northern part of the Vogelkop.
SUPERB FRUIT-DOVE *P. superbus*. Singles seen at Helipad 4.
WHITE-BIBBED FRUIT-DOVE *P. rivoli*. Common from above Helipad 2 to the summit.
PURPLE-TAILED IMPERIAL-PIGEON *Ducula rufigaster*. Heard between Worsaret and Helipad 2.
PINON IMPERIAL-PIGEON *D. pinon*. Heard at Helipad 2.
BANDED IMPERIAL-PIGEON *D. zoeae*. Below and at Helipad 2.
PAPUAN MOUNTAIN-PIGEON *Gymnophaps albertisii*. Frequent near Helipad 5.
DUSKY LORY *Pseudeos fuscata*. Flocks of 30 plus flying over at Helipads 4 and 5 and a few singles at Helipad 2.
BLACK-CAPPED LORY *Lorius lory*. Heard below Helipad 2.
FAIRY LORIKEET *Charmosyna pulchella*. Several seen around Helipads 4 and 5.
PALM COCKATOO *Probosciger aterrimus*. Frequent from coast to Helipad 2.
SULPHUR-CRESTED COCKATOO *Cacatua galerita*. Common below Helipad 2.
ECLECTUS PARROT *Eclectus roratus*. A few near the coast.
MOLUCCAN KING-PARROT *Alisterus amboinensis*. Heard below Helipad 2.
BRUSH CUCKOO *Cacomantis variolosus*. Heard below Helipad 2.
CHESTNUT-BREASTED CUCKOO *C. castaneiventris*. Often heard and a few seen between Helipad 2 and the summit.
WHITE-EARED BRONZE-CUCKOO *Chrysococcyx meyeri*. Singles seen between Helipads 2 and 4.
GREATER BLACK COUCAL *Centropus menbeki*. Several calling after dusk at Helipad 4.
LESSER SOOTY-OWL *Tyto multipunctata*. Heard nightly at Helipads 4 and 5; readily came in to whistled imitation of call at the former camp.
RUFOUS OWL *Ninox rufa* (?). A Ninox heard at Helipad 4 was presumed to be this species.
JUNGLE HAWK-OWL *Ninox theomacha*. Singles heard at Helipads 2 and 4.
MARBLED FROGMOUTH *Podargus ocellatus*. Many calling at Helipad 2 and one at Helipad 4.
UNIFORM SWIFTLET *Collocalia vanikorensis*. Frequent from the coast to Helipad 4.
GLOSSY SWIFTLET *C. esculenta*. Frequent at all altitudes.
RED-BREASTED PARADISE-KINGFISHER *Tanysiptera nympha*. One of these beautiful kingfishers seen in the disturbed forest near the clearing surrounding Worsaret.
HOOK-BILLED KINGFISHER *Melidora macrorrhina*. Heard every evening from Worsaret to my highest camp at Helipad 5.
RUFOUS-BELLIED KOOKABURRA *Dacelo gaudichaud*. Recorded near Worsaret.
YELLOW-BILLED KINGFISHER *Syma torotoro*. Frequently heard and several seen from Worsaret to Helipad 4.
RAINBOW BEE-EATER *Merops ornatus*. Noted at Worsaret and Helipad 4.
BLYTH'S HORNBILL *Aceros plicatus*. Small numbers noted from the lowlands to the highest altitude reached.
RED-BELLIED PITTA *Pitta erythrogaster*. One heard between Worsaret and Helipad 2.
STOUT-BILLED CUCKOO-SHRIKE *Coracina caeruleogrisea*. A few seen from Helipad 4 to the summit.
BLACK-SHOULDERED CICADABIRD *C. incerta*. One seen in a mixed species flock between Helipads 2 and 4.

BLACK-BELLIED CUCKOO-SHRIKE *C. montana*. One of the commoner species from Helipad 2 to the highest altitudes.
ISLAND LEAF-WARBLER *Phylloscopus poliocephalus*. Occasionally found in mixed species flocks between Helipads 4 and 5.
RUSTY MOUSE-WARBLER *Crateroscelis murina*. Often heard and a few seen up to Helipad 4.
MOUNTAIN MOUSE-WARBLER *C. robusta*. Several seen at the highest altitudes between Helipads 4 and 5. Found by Diamond (1985) in the Kumawa Mountains but not previously in the Fakfak.
PALE-BILLED SCRUBWREN *Sericornis spilodera*. Occasionally met with between Worsaret and Helipad 4.
PERPLEXING SCRUBWREN *S. virgatus*. A pari seen between Helipads 2 and 4.
GREY-GREEN SCRUBWREN *S. arfakianus*. Seen daily between Helipad 2 and the highest altitude reached.
MOUNTAIN GERYGONE *Gerygone cinerea*. Singles seen between Helipads 4 and 5.
YELLOW-BELLIED GERYGONE *G. chrysogaster*. Heard between Worsaret and Helipad 2.
FAIRY GERYGONE *G. palpebrosa*. Singles noted between Worsaret and Helipad 4.
BROWN-BREASTED GERYGONE *G. ruficollis*. Frequent from Helipad 4 to the summit.
RUFOUS-BACKED FANTAIL *Rhipidura rufidorsa*. One seen in secondary scrub near Worsaret.
BLACK FANTAIL *R. atra*. A common and conspicuous bird from Helipad 2 to the summit.
FRIENDLY FANTAIL *R. albolimbata*. Frequent at the higher altitudes between Helipads 4 and 5.
NORTHERN FANTAIL *R. rufiventris*. Recorded between Worsaret and Helipad 2.
BLACK MONARCH *Monarcha axillaris*. Seen on two occasions between Helipads 2 and 5.
BLACK-WINGED MONARCH *M. frater*. A couple in a mixed species flock between Worsaret and Helipad 2.
SPOT-WINGED MONARCH *M. guttulus*. A few between Worsaret and Helipad 2, usually in mixed species flocks.
GOLDEN MONARCH *M. chrysomela*. A couple seen in mixed species flock between Worsaret and Helipad 2.
FRILLED MONARCH *Arses telescophthalmus*. Singles noted from near Worsaret to as high as Helipad 4.
BLACK-BREASTED BOATBILL *Machaerirhynchus nigripectus*. Seen on a couple of occasions between Helipads 4 and 5.
YELLOW-LEGGED FLYROBIN *Microeca griseoceps*. One seen between Helipads 2 and 4.
CANARY FLYROBIN *M. papuana*. A pair seen at the summit.
WHITE-FACED ROBIN *Tregellasia leucops*. Several seen in a rather narrow altitudinal band between Helipads 2 and 4.
BLACK-SIDED ROBIN *Poecilodryas hypoleuca*. Fairly frequent between Worsaret and Helipad 2.
OLIVE-YELLOW ROBIN *P. placens*. Three or four singing birds present within a narrow altitudinal band, just above the upper limit of the last species, half way between Worsaret and Helipad 2.
BLUE-GREY ROBIN *Peneothello cyanus*. Frequent between Helipad 4 and the summit. One heard between Helipads 2 and 4.
REGENT WHISTLER *Pachycephala schlegelii*. A few individuals seen near the summit.
GREY WHISTLER *P. griseiceps*. A few in feeding flocks between Worsaret and Helipad 2.
RUFOUS-NAPED WHISTLER *Aleadryas rufinucha*. One seen close to the summit between Helipads 4 and 5.
LITTLE SHRIKE-THRUSH *Colluricincla megarhyncha*. Found in bamboo stands between Helipads 2 and 4.
VARIABLE PITOHUI *Pitohui kirhocephalus*. Frequent at lower altitudes below Helipad 2.
HOODED PITOHUI *P. dichrous*. Common from Helipad 2 to Helipad 4.

RUSTY PITOHUI *P. ferrugineus*. Several groups seen between Worsaret and Helipad 4, sometimes in mixed species flocks.
CRESTED PITOHUI *P. cristatus*. The incredible song of this species occasionally heard between Worsaret and Helipad 4.
BLACK PITOHUI *P. nigrescens*. Two females seen close to the summit between Helipads 4 and 5. A much darker earthy-brown above than other races, warmer brown below and quite ochreous on the under tail coverts.
BLACK BERRYPECKER *Melanocharis nigra*. Noted between Worsaret and Helipad 2.
OLIVE-CROWNED FLOWERPECKER *Dicaeum pectorale*. Occasionally seen between Helipads 2 and 4.
CAPPED WHITE-EYE *Zosterops fuscicapillus*. Frequent between Helipads 4 and 5.
OLIVE STRAIGHTBILL *Timeliopsis fulvigula*. A few in a feeding flock near Helipad 4.
LONG-BILLED HONEYEATER *Melilestes megarhynchus*. One bird seen between Helipads 4 and 5.
GREEN-CROWNED LONGBILL *Toxorhamphus novaeguineae*. Singles noted between Worsaret and Helipad 4.
PLUMED LONGBILL *T. iliolophus*. Singles seen at Helipad 4 and below Helipad 2.
RED MYZOMELA *Myzomela cruentata*. Several seen around Helipads 4 and 5.
RED-COLLARED MYZOMELA *Myzomela rosenbergii*. Frequent from Helipad 4 to the highest altitude reached.
VOGELKOP MELIDECTES *Melidectes leucostephes*. Two sightings at and near Helipad 4. Diamond (1985) discovered this species in the Kumawa mountains but not in the Fakfaks.
PYGMY DRONGO *Chaetorhynchus papuensis*. One seen at Helipad 4.
GREAT WOOD-SWALLOW *Artamus maximus*. Several seen soaring over Helipad 4.
MOUNTAIN PELTOPS *Peltops montanus*. Singles below Helipad 2 and between Helipads 2 and 4.
SPOTTED CATBIRD *Ailuroedus melanotis*. Heard between Helipads 2 and 4.
CRINKLE-COLLARED MANUCODE *Manucodia chalybata*. Two birds seen in a fruiting tree at Helipad 5.
TRUMPET MANUCODE *M. keraudrenii*. Heard between Worsaret and Helipad 4.
MAGNIFICENT RIFLEBIRD *Ptiloris magnificus*. Males calling through the day from just above Worsaret to the highest altitudes reached. A few female plumaged birds seen in mixed species flocks.
BLACK-BILLED SICKLEBILL *Epimachus albertisi*. Frequently heard and several seen from Helipad 4 to 5. This is the first record from the Fakfak. The single female bird trapped by Diamond (1985) in the Kumawa Mountains he attributed to *E. a. albertisi*. However the voice of the Fakfak bird differs markedly from the nominate birds of the Arfak Mountains. Arfak birds give a Whimbrel-like call lasting 3–4 seconds, rising in volume and slightly accelerating. The call heard in the Fakfak was more of a series of down-slurred whistles slightly decelerating and much less rapidly delivered, rather reminiscent of a slowed-down yaffle of a Green Woodpecker *Picus viridis*.
KING BIRD-OF-PARADISE *Cicinnurus regius*. Heard in the first few kilometers of forest above Worsaret.
MAGNIFICENT BIRD-OF-PARADISE *C. magnificus*. Males very commonly heard and female plumaged birds often seen from below Helipad 2 to the highest altitude reached.
LESSER BIRD-OF-PARADISE *Paradisaea minor*. Heard between Worsaret and Helipad 2.
GREY CROW *Corvus tristis*. Frequent from the coast to the highest altitude reached.

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Notes on new and scarce birds in the Falkland Islands 1988–1990

by Phil Gregory

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The status and history of birds in the Falkland Islands have been well documented by Woods (1988), but records after publication of that book require summary. This paper lists my own observations and those of both local residents and visitors, which I collected from November 1988 to December 1990 whilst resident in the islands. My wildlife column in the *Penguin News*, the local newspaper, was a useful contact point for the collection of sightings that might otherwise have gone undocumented, and the introduction of a telephone system throughout the islands in 1989 was also invaluable for these purposes. Many local people take an interest in birds and anything strange is soon noted.

This paper notes the first occurrence in the Falkland Islands of Snares Island Penguin *Eudyptes robustus*, Royal Penguin *Eudyptes* (*chrysolophus*) *schlegeli*, Georgian Diving-petrel *Pelecanoides georgicus*, Long-winged Harrier *Circus buffoni*, Greater Yellowlegs *Tringa melanoleuca* and Sand Martin *Riparia riparia*. A number of other vagrants are detailed.

Potential colonists are also noted, with breeding season records of Great Grebe *Podiceps major*, Red Shoveler *Anas platalea*, White-winged Coot *Fulica leucoptera* and Rufous-collared Sparrow *Junco capensis*. The latter species seems to be occurring much more often in the west, and is a likely colonist. Over-wintering of Red Shoveler and Buff-necked Ibis *Theristicus caudatus* is documented, and the first breeding records of Barn Owl *Tyto alba* are given.

The observations are my own unless credited to other observers, chief of whom are Dr Bill Bourne (WRPB). Alan Henry (AH), Michael Morrison (MM), Dave Osborn (DO), and Commander Mike Winter (MW). The following codes give an indication of status at the Falkland Islands; V, vagrant; PM, passage migrant. Other status is as noted.

Systematic list

CHIN-STRAP PENGUIN *Pygoscelis antarctica* V

An annual vagrant in recent years. One at Penguin Walk in Dec 88. One on Saunders Island 23 Nov 1989 amongst a Gentoo Penguin *P. papua* colony (DO). A single moulting bird was at the tip of Cape Pembroke 14 Apr 1990.

ROYAL PENGUIN *Eudyptes (chrysolophus) schlegeli* V

Ian Strange (pers. comm.) reports several birds in a Rockhopper Penguin *E. chrysocome* colony on West Falkland, an astonishing range extension from Macquarie Island. Dates and details could not be obtained but the record is now published in Strange (1992).

SNARES CRESTED PENGUIN *E. robustus* V

Ian Strange showed me a photograph of an erect-crested penguin species in a Rockhopper colony on West Falkland, which he identified as being a Snares Crested Penguin, an amazing vagrant from New Zealand. The bird was at the Settlement rookery on New Island on 10 Dec 1988, for a single day only; seen and photographed by T. Lomey (1990).

It is worth speculating whether odd individuals of antipodean penguins wander more widely than is realized, given previous Falkland records of two such species: Fiordland Crested Penguin *E. pachyrhynchus*, considered doubtful by Woods with provenance and exact 19th century date uncertain, and Erect-crested Penguin *E. sclateri* on West Point Island in 1961–66, paired with a Rockhopper and twice attempting nesting.

GREAT GREBE *Podiceps major* Annual vagrant

One in non-breeding dress, Pebble Island 4 Dec 1988 (J. Reid). One in partial breeding dress, Beaver Pond, Pebble Island 18–19 Dec 1988. Two birds off Port Howard for much of Feb–Mar 1988 (local observers).

ROYAL ALBATROSS *Diomedea epomophora* PM

10 on 3 Feb 1989 in Berkeley/Falkland Sounds. 2 adults of the race *epomophora* off Saunders Is. 5 Feb 1989.

GREY-HEADED ALBATROSS *Diomedea chrysostoma* PM

An adult off Kidney Is. 27 Nov 1988, and an adult in Berkeley Sound 25 Jan 1989.

LIGHT-MANTLED SOOTY ALBATROSS *Phoebetria palpebrata* V

An adult flew E past Hookers Point during a gale on 15 Dec 1990 (AH).

NORTHERN GIANT PETREL *Macronectes halli* Status uncertain

Despite careful looking, I was able to make no definite identifications of this species, which has bred on Beauchene Island. The numerous birds at Stanley butchery outfall were always Southern Giant Petrels *M. giganteus*. I had several strong probables of *M. halli*, e.g. on Carcass Is. 9 Sept 1989 and 8 Sept 1990, and also some birds of intermediate form off Christina Bay on 15 Sept 1990. These had narrow white leading edges to the wing, pale bodies and horn-coloured bills with dark tips. Nesting colonies of Giant Petrels on Sea-lion and Pebble Islands were all *M. giganteus*. The Northern Giant Petrel is clearly very scarce in the islands and should be identified with great care.

ANTARCTIC PETREL *Thalassoica antarctica* V

A single bird killed by a Peregrine *Falco peregrinus* between Brookfield and Port Louis on 15 Sept 1990. Michael Morrison brought me the corpse, which had no black trailing edge to the secondaries, and only a narrow dark tip to the single remaining tail feather. Presumably the bird's feathers were heavily abraded. The bill was dark grey and the legs and feet dirty pink. The fifth record for the islands.

SOFT-PLUMAGED PETREL *Pterodroma mollis* Probably annual PM

5+ off Cape Pembroke on 1 Apr 1990. Observations at sea by MW and WRPB were of 50 within the 200 mile limit on 5 Feb 1990, and 17 110–150 km ESE of Cape Pembroke on 24 Feb 1990. Likely to be an annual visitor as suggested by Woods.

GREAT-WINGED PETREL *Pterodroma macroptera* V

One between 110 and 150 km ESE of Cape Pembroke on 5 Feb 1990 (MW, WRPB). The third record.

ANTARCTIC PRION *Pachyptila desolata* Uncertain, perhaps regular

Hundreds during the morning of 4 Feb 1990 en route from Punta Arenas to Stanley and nearing the edge of the 200 mile limit. Around mid-day this species was replaced by the Thin-billed Prion.

THIN-BILLED PRION *P. belcheri* Breeder on West Falkland

Thousands during the afternoon of 4 Feb 1990 as we entered Falkland waters en route from Punta Arenas to Stanley, replacing the flocks of Antarctic Prion seen earlier. One bird had a marked buffish tip to the tail, similar to Blue Petrel *Halobaena caerulea* pattern but lacking distinctive head markings and otherwise being typical of *P. belcheri*. A second bird had a narrow pale tip to the tail.

GREY PETREL *Procellaria cinerea* V

One 110–150 km ESE of Cape Pembroke on 24 Feb 1990 (MW, WRPB).

GREAT SHEARWATER *Puffinus gravis* Scarce breeder

13 off Kidney Is. 28 Dec 1988; *c.* 20 in Berkeley Sound 21 Jan 1989; 2 off Cape Pembroke 8 Dec 1989; 2 off E. Falkland 30 Dec 1989; and 1 there 5 Feb 1990. 40 110–150 km ESE of Cape Pembroke 24 Feb 1990 (MW, WRPB). 1 off Cape Pembroke 10 Mar 1990; 15 off Christina Bay 22 Apr 1990; 1 off Cape Pembroke 28 Apr 1990.

MANX SHEARWATER *Puffinus puffinus* V

A single bird within Falkland waters on 5 Feb 1990 (MW, WRPB). The third record to date.

LITTLE SHEARWATER *Puffinus assimilis* V

One on 24 Feb 1990 110–150 km ESE of Cape Pembroke, and another on 3 Mar 1990 185 km ESE of Cape Pembroke (MW, WRPB). The second and third records.

WHITE-BELLIED STORM PETREL *Fregetta grallaria* V

One on 24 Feb 1990 110–150 km ESE of Cape Pembroke (MW, WRPB) was the third sighting within territorial waters (cf. Woods 1988).

GREY-BACKED STORM-PETREL *Garrodia nereis* Scarce breeder

Only two records of this uncommon species: one in Falkland Sound 3 Feb 1989, and one at sea off West Falkland 4 Feb 1990. In addition, remains of single birds were found on Kidney Is. during the breeding seasons of both 1989 and 1990, suggesting that nesting still occurs there despite a lack of live sightings.

GEORGIAN DIVING-PETREL *Pelecanoides georgicus* V, perhaps overlooked

A dead bird picked up at Stanley swimming pool on 31 Mar 1990 had been present since 26 Mar (Willie Harvey); specimen sent to BAS. The first record for the islands, but it could easily be overlooked as field identification is impossible. A small wreck of seabirds occurred around this time, with 2 Sooty Shearwaters *Puffinus griseus* and a Common Diving-petrel *P. urinatrix* being picked up in the same vicinity. They may have been attracted by the lights of the newly completed swimming pool.

MAGELLAN DIVING-PETREL *P. magellani* V

A single bird of what appeared to be this species came abroad the M.V. *Stena Seaspread* in Falkland Sound during foggy weather in mid-June 1990. Commander Mike Winter caught and photographed the bird, which showed the broad white half-collar typical of *P. magellani*. The species is only known from two records of birds in 1888 and 1930, and a couple of sight records in 1984. It perhaps occurs much more often than is realised. WRPB (*in litt*) informs me that the 1888 specimen is actually a misidentified Common Diving-petrel, making MW's bird the fourth for the Falklands.

COCOI HERON *Ardea cocoi* V

One at Dupree Harbour late May 1989, and perhaps the same bird at Monty Dean's Creek on 9 Sept 1989 (MM); 1 at Cow Bay 5 Oct 1989 (J. and G. Smith); 1 at Albemarle Creek, West Falkland, 29 Oct 1989 (G. Whatley); 1 at Estancia 6 May 1990 (A. Heathman) and maybe the same bird at Moody Brook 14 May 1990 (G. Cheek). Birds can clearly survive for long periods at favourable sites. All these records could refer to a single individual.

SNOWY EGRET *Egretta thula* V

One at Bertha's Pond 21 May 1989 (D. Munns) was the 4th record for the Falklands.

CATTLE EGRET *Bubulcus ibis* PM, first recorded 1976

No records in 1989, but a small influx in 1990, with records of up to 7 birds at various localities between 23 Mar and 6 May.

BUFF-NECKED IBIS *Theristicus caudatus* Annual vagrant

A long-staying individual on Cape Pembroke from June to 25 Dec 1989 at least (Father J. Doran and many observers). 1 at Fitzroy 16 Sept 1990, 1 at Shallow Harbour mid-Oct 1990 (M. Marsh), 1 at Port Edgar 21 Oct 1990 (M. and A. Alazia), 2 on Pebble Is. Oct 1990 (J. Reid).

ROSEATE SPOONBILL *Ajaja ajaja* V

A single bird at Monty Dean's Bridge 29 May–1 Jun 1989, and a dead bird found in late August about a mile from the bridge, presumably the same individual (MM). The fifth record; two of the previous birds have also been found dead.

CHILEAN FLAMINGO *Phoenicopterus chilensis* V

One at Fox Point in Feb 1989 (Mrs Brindall) was the 4th record for the islands.

COSCOROBA SWAN *Coscoroba coscoroba* V

No records in the period 1988–90, contra the statement in Strange (1992): "probably resident, breeding not yet confirmed".

FERAL GOOSE *Anser anser* Introduced resident, increasing

Odd birds were seen around Stanley in the period; also 15 on Sea Lion Is. 17 Jan 1989, 15 on Carcass Is. 9 Sept 1989 and 20 there 9 Sept 1990, with a clutch of 6 eggs in one nest. White-plumaged individuals are frequent and are sometimes reported as Coscoroba Swans. This feral species is not listed in Strange (1992).

ASHY-HEADED GOOSE *Chloephaga poliocephala* Annual vagrant

One at Port Louis 15 Sept 1990 (MM); one at Penguin Walk 11–13 Oct 1990 (AH), and one on Sea Lion Is. in early Oct 1990.

MALLARD *Anas platyrhynchos* Failed introduction

No records of feral stock in the period. Domestic ducks in Stanley resemble Mallard.

CINNAMON TEAL *Anas cyanoptera* Annual vagrant in recent years

Three pairs on Pebble Island in Dec 1988 (J. Reid); 1 male Carcass Is. 9 Sept 1989; 1 female Surf Bay pond 15–16 Oct 1989; 1 male Cape Pembroke 21–26 Nov 1989 (DO); 1 female airstrip ponds 25 Dec 1989 (DO); 2 females Carcass Is. 9 Sept 1990 (very wild, almost certainly newly arrived); 1 male Betts Pond, Pebble Is. 23 Dec 1990 and the male plus a pair there 27 Dec 1990. The presence of pairs in the breeding season is noteworthy.

RED SHOVELER *Anas platalea* Annual vagrant in recent years

One female Pebble Is. Dec 1988 (J. Reid); 1 male Sea Lion Is. 14 Nov 1989 (DO); 1 pair Stanley airstrip ponds 15–19 Dec 1989 (G. Bound), and a female there 25 Dec 1989 (DO); 4 males and 1 female Bertha's Beach track Pond 31 Mar 1990, and over-wintered (MW); 1 female Long Pond, Pebble Is. 26 Dec 1990. The occurrence of over-wintering birds and pairs suggests the possibility of breeding.

LONG-WINGED HARRIER *Circus buffoni* V

A single dark-morph bird near Stanley on 25 Feb 1989 was the first for the Falklands. Confusion with the dark phase of Red-backed Hawk *Buteo polyosoma* is possible on a poor view, but the bird was seen at close range for some minutes.

AMERICAN KESTREL *Falco sparverius* V

A female at Port Louis 25 Feb–6 Apr 1989 (MM), which returned on 17 May and remained until 30 Aug; also a female seen at Brookfield and Long Is. during this time, perhaps the same individual. An immature male at Moody Brook 14–27 May 1989. Successful overwintering of vagrant birds, as suggested by Woods, is proven by the Port Louis individual.

CHIMANGO CARACARA *Milvago chimango* V

One on Cape Pembroke in autumn 1988 (AH) is the third or fourth record.

WHITE-WINGED COOT *Fulica leucoptera* V

One present on Betts Pond, Pebble Is. on 18 Dec 1988, and another on Beaver Pond the same day.

SOUTHERN LAPWING *Vanellus chilensis* Annual vagrant

One at Brookfield 1 Aug to Nov 1989; a second bird arrived 9 Sept 1989 but did not stay (M. Morrison). Single birds Stanley Common 13 Aug 1989 (AH), Beaver Is. 20 Nov 1990 (D. Poncet), and Sea Lion Is. 24 Nov 1990 (P. Watts).

TAWNY-THROATED DOTTEREL *Eudromias ruficollis* V

One on Stanley Common 15 Sep 1989 (S. Gregory) was the third for the islands.

WHIMBREL *Numemius phaeopus* PM, a few overwintering

Twelve on Wreck Point, Pebble Is., 19 Dec 1988 had over-wintered (J. Reid); also 2 on Carcass Is. Sep 1989 (R. McGill), 1 on Cape Pembroke 16 Oct 1989, and 1 on Sand Point, Pebble Is., 25 Dec 1990.

GREATER YELLOWLEGS *Tringa melanoleuca* V

One at the Frying Pan near Mt. Pleasant from 11 Nov to at least 5 Dec 1989. The first for the Falklands.

SANDERLING *Calidris alba* PM

81 on Bertha's Beach 14 Nov 1989 (DO), the maximum recorded for the islands.

BAIRD'S SANDPIPER *Calidris bairdii* V, probably annual

May be much overlooked amongst the flocks of White-rumped Sandpipers *C. fuscicollis*. The following were recorded, all 1989: 2 ad Surf Bay 23 Jan; 1 juv Surf Bay 2 Feb; 4 (2 ad, 2 juv) Canache 10 Oct; 1 ad Surf Bay 16 Oct and 2 ad there next day; 1 Bertha's Beach 29 Oct and 2 there 4 Nov (DO).

LEAST SEEDSNIPE *Thinocorus rumicivorus* V

A female at Gipsy Cove on 1 Oct 1989 (AH). The 8th record for the islands, but quite likely much overlooked.

SOUTH POLAR SKUA *Catharacta maccormicki* V

One on the sea off Cape Pembroke on 10 Mar 1990, later heading off north. Few records, but may be much overlooked.

ARCTIC TERN *Sterna paradisaea* Rare PM

An adult in non-breeding dress flew S past Cape Pembroke on 15 Nov 1990. Suspected on several other occasions at passage periods but this was my only confirmed sighting.

COMMON TERN *Sterna hirundo* V

One in non-breeding dress at Bertha's Beach on 4 Nov 1989 (DO). The second record for the islands. Common or Arctic Terns are recorded off Cape Pembroke at passage periods each year, generally distant.

ANTARCTIC TERN *Sterna vittata* PM

An adult in breeding dress 21 Oct 1989 in Port William; 16 at Cape Pembroke 6 Nov (DM, DO) and 5 there 7 Dec 1989 (DO); 1 at Bertha's Beach 11 Dec and 4 there 27 Dec 1989 (DO); 1 ad in breeding dress at Surf Bay 4 Nov 1990; 20+ off Kidney Is. and a first-winter bird dead on the beach, 25 Nov 1990.

Strange (1992) lists this species as a vagrant, but these observations suggest a regular passage. The species was suspected on other occasions but only close-range birds were conclusively identified because of possible confusion with Common, Arctic and possibly the larger South American Tern *S. hirundinacea*.

[**SANDWICH TERN** *Sterna sandvicensis* V

An adult winter-plumage bird at Bertha's Beach on 28 Nov and again on 27 Dec 1989 (DO) was probably this species, not previously recorded for the islands; but the possibility of its being a Cayenne Tern *S. (s.) eurygnatha* cannot be excluded.]

EARED DOVE *Zenaida auriculata* V

One at Port Louis 2–12 Apr 1990 (MM). The dates fit nicely with passage periods.

BARN OWL *Tyto alba* Rare breeder

2 juv at Moody Brook barracks 3 May and 4 (2 ad, 2 juv) there 14 May 1989. One juv was the normal white-breasted form, the other was a rich golden-buff beneath, much less conspicuous in the gloom of the derelict barracks. Shane Wolsey confirmed breeding at a settlement in East Falkland (pers. comm.), so this was only the second breeding record. Doubtless the nearby rubbish tip was a good food source. The barracks was demolished in July 1990. One at Cape Pembroke late May 1989 (D. Munns). One at FIPASS 2 Aug 1990 (AH) may have been a fugitive from the wrecked barracks site.

FIRE-EYED DIUCON *Pyrope pyrope* V

One at Hill Cove in Nov 1990 (per T. Blake) was at least the 7th for the islands.

RUFOUS-BACKED NEGRITO *Lessonia rufa* V

A male came aboard the *Falklands Right* off West Falkland, *c.* 30 nautical miles WSW of Cape Meredith, on 11 Oct 1988 (crew, pers. comm.). One on New Island in late Nov 1990 after prolonged westerly gales (T. Chater). The 2nd and 3rd records for the islands.

FORK-TAILED FLYCATCHER *Tyrannus savana* V

An adult at Gipsy Cove on 2–3 Apr 1989 (R. Bayliss) is the 4th record for the islands.

CHILEAN SWALLOW *Tachycineta leucopyga* Scarce PM

1 juv Stanley House 4–6 Mar 1989; 3 Cape Pembroke 7 Mar 1990 (D. Munns, WRPB); 1 Frying Pan 1 Apr 1990; 2 John St., Stanley, 11 Mar 1990 and 5 there 26 Mar 1990 (AH); 2 at Brookfield farm April 90 (J. McPhee); 1 on Sea Lion Is. 23 Dec 1990. Evidently a regular passage visitor in small numbers. The juvenile in Stanley was clearly this species and not the very similar White-rumped Swallow *T. leucorrhoa*, which is also a potential vagrant.

BARN SWALLOW *Hirundo rustica* Scarce PM

A passage visitor in small numbers, more frequent in the austral spring. Records as follows: 1 in Stanley 13 Oct 1989; 1 juv Cape Pembroke 14 Oct 1989; 1 Stanley racecourse 31 Mar 1990; 1 in Stanley 5 Aug 1990 during a strong westerly gale (the first August record for the islands); 1 at Surf Bay 7 Oct 1990.

SAND MARTIN *Riparia riparia* V

Two at Government House in Stanley on 13 Oct 1988 (S. Wolsey and R. Bayliss pers. comm.) were the first records for the islands. One over Beaver Pond, Pebble Is., on 18 Dec 1988.

CLIFF SWALLOW *Petrochelidon pyrrhonota* V

One along Cape Pembroke on 8 Dec 1989 (M. Whitehouse and G. Cripps); 2 at Stanley airport on 14–15 Nov 1990 were exhausted and had clearly only just arrived. The second and third records for the islands.

RUFOUS-COLLARED SPARROW *Zonotrichia capensis* V, probably annual

A small number on Beaver Is. and New Is. in late May/early June 1990 (S. Poncet and T. Chater); 1 in tussock near the settlement, Carcass Is. 4 Sept, and 1 singing by the settlement 7 Sept 1990; 2 at NW Point, Carcass Is. 8 Sept 1990 and 1 there next day. At least 4 individuals involved in this small spring influx. The species seems to be turning up more often these days, particularly in the west.

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Notes on the Black-throated Antwren *Myrmeciza atrothorax* and Spot-breasted Antwren *M. stictothorax* in Brazil

by Dante Martins Teixeira, Jorge B. Nacinovic & Frieda Maria Marti

Received 26 November 1992

The Black-throated Antwren *Myrmeciza atrothorax* is a common South American formicariid, widely distributed from the Guianas, Venezuela and eastern Colombia south to northern Bolivia and Amazonian Brazil. According to our observations, this species inhabits the thick lower strata of humid forests, secondary growth scrub, and also the gallery forests of northern Mato Grosso, central Brazil. As mentioned by Hilty & Brown (1986), this antwren occasionally joins army-ants or mixed flocks, composed of such species as *Cymbilaimus lineatus* and *Thyrothorus coraya*, as we recorded in August 1991 at an advanced base camp of the Brazilian Army (*c.* 0°28′N, 66°43′W) near the rio Demiti. In this locality, isolated individuals or pairs were easily observed hopping on the ground with the tail obliquely pointed up and sometimes flicked. Like other formicariids, *M. atrothorax* may be a noisy species when it searches within the dry leaves and scans the litter or the surface of branches and fallen trunks looking for insects (Diptera, Orthoptera, Coleoptera, Isoptera and Hemiptera, as we found from stomach contents; see also Schubart *et al.* 1965). Adult calls include a sequence of loud whistles, *bhee-bhee-bhee*. . ., and a sharp *bheerrk* as alarm; young birds may give a long series of *pic* notes, apparently as a location call.

The breeding biology of *M. atrothorax* is almost unknown. Friedmann (1948) reported one male with enlarged testes obtained in January at São Gabriel da Cachoeira (*c.* 0°08′S, 67°05′W), Amazonas. In the series of specimens in the Museu Nacional, birds from the upper rio Negro collected in August and October have small gonads, which measured 1–2 mm (males) and 6–7 mm (females). The nest and eggs seem to be undescribed, but we obtained a young bird on 6 December 1984 from Fazenda Pantanalzinho, *c.* 13 km northwest of Porto Esperidiao (*c.* 15°31′S, 58°28′W), northern Mato Grosso. This specimen (MN 36107; total length 133 mm, weight 17 g) was a young male, recently feathered, with a non-ossified skull and small gonads (1 mm), and measured: culmen 11.2 mm, wing 58 mm, tail 40.8 mm, tarsus 25.5 mm. It was observed following its parents in the thick lower strata of the humid gallery forest, and was attended by both male (MN 33664; gonads 4 mm, total length 145 mm, weight 16.5 g) and female (MN 33665; gonads 5 mm, total length 140 mm, weight 18 g).

The young male of the Black-throated Antwren has the lores, face and chin greyish (OOS-10-1° according to the colour catalogue of Villalobos & Villalobos 1947). The feathers of the pileum are chestnut (OOS-6-5°) with narrow blackish borders, giving a slightly scaled appearance; mantle and back also chestnut, slightly more rufescent and brighter (OOS-7-6°) than the pileum. Upper wing coverts chestnut (OOS-7-6°), the lesser and median ones with narrow blackish tips, giving an inconspicuous scaled pattern; alula ash grey (OOS-6-3°), with a dark chestnut (OOS-8-4°) tinge in the borders; remiges blackish (OOS-4-2°) with light chestnut (OOS-7-6°) borders. Rump ash black (OOS-6-10°); tail black. The feathers of throat, breast, belly and flank are greyish (OOS-10-1°), with broad chestnut tips (OOS-7-6°) which nearly cover the exposed area of the foreneck, breast and flanks feathers. Centre of belly, lower abdomen and thighs greyish (OOS-10-1°); under tail-coverts ash black (OOS-6-10°). Iris chestnut; bill black with a somewhat lighter gonys and yellowish rictus; tarsus pale rosy-greyish, with greyish feet.

At the first sight, the plumage of the young male of *M. atrothorax* is similar to that of the adult male, but there is no trace of a black throat, and the interscapular patch and the white spots of the upper wing coverts are completely absent. However, two subadult males collected by G. F. Mees in Surinam, and now housed in the Natuurhistorisch Museum of Leiden (NM 36918, Brokopondo, 30 May 1965, gonads 1.7 mm, weight 15.1 g; NM 72647 Nassau Gebergte, 20 July 1972, gonads 1.9 mm, weight 16.3 g), show an intermediate plumage, which differs from the adult male pattern mainly by having a few whitish dots in the upper wing-coverts, the throat greyish or greyish-white marked with black, and an olivaceous tinge in the blackish breast patch. These specimens have the same size as adults (culmen 13–14.8 mm, wing 57 mm, tail 58.3 mm, tarsus 23.6–25.2 mm), and show no significant differences in the colouration of the bare parts, but the palate is yellow according the original labels. As the adult females of the species have a rather different colouration, especially on the underparts, it is interesting to stress that in some other representatives of the genus, such as the Sooty Antbird *Myrmeciza fortis* and the Grey-headed Antbird *M. griseiceps*, the plumage of young males has been said to be similar to that of the adult female (Gyldenstolpe 1945, Hilty & Brown 1986, Fjeldså & Krabbe 1990). This discrepancy, however, is perhaps not remarkable, as *Myrmeciza* is very heterogeneous and seems not to be a monophyletic genus (Zimmer 1932, Willis 1985).

Additionally, we would like to comment on the status of the Spot-breasted Antwren *Myrmeciza stictothorax* (Todd, 1927), which is known from a single pair collected at Apacy, west bank of lower Tapajos (probably 3°15′S, 55°10′W). As has been previously noted (Todd 1927, Meyer De Schauensee 1970), this species closely resembles *M. atrothorax*, except for the more extensively white underparts of female and the white-spotted breast of male. However, it is noteworthy that males of *M. atrothorax* from the northern bank of the Amazon may also have some white marks on the breast, which suggests that the male of the Spot-breasted Antwren is a specimen of the Black-throated Antwren with a well-defined spotted pattern (Schulenberg & Stotz 1991). In this connection we may mention that the Museu Nacional houses a second male of *M. stictothorax* (MN 31073, gonads 2 mm) collected by Jose Hidasi near Rio Branco (*c.* 9°58′S, 67°48′W), Acre, on 29 May 1968. This specimen does not appreciably differ in size from *M. stictothorax* (culmen 13.9 mm, tarsus 24.3 mm, tail 54.8 mm, wing 60 mm), and has the same dark colouration. Like the holotype of the Spot-breasted Antwren, it has the upperparts olive-brown (OOY-6-8°), and its breast shows about 30 black feathers shaft-marked with white, in the conspicuous pattern also described for the holotype of *M. stictothorax*. The larger of these white streaks are approximately 10 mm long and 0.7 mm wide, and there is a single feather with the shaft streak enlarged distally, forming a whitish apical spot.

Although it might not be unreasonable to treat *M. stictothorax* merely as a synonym of *M. atrothorax*, without even any taxonomic validity at the subspecies level, any conclusion about the status of this taxon seems to be premature, as the available information is so scanty. It should be pointed out that the alleged differences between the females of the two taxa may not be reliable, bearing in mind the high degree of intraspecific variation occurring in the plumage of several formicariids (see also Hellmary 1929). Indeed, the series of *M. atrothorax* in the collections of Museu Nacional includes two noteworthy females (the above-mentioned MN 33665 and MN 38597 from Jacaré, rio Kuluene, *c.* 12°00′S, 53°24′W) with the centre of abdomen extensively white, in the pattern attributed to *M. stictothorax*. On the other hand, however, both males of *M. stictothorax* show the same dark plumage, which resembles the colouration of some subspecies of *M. atrothorax*, e.g. the nominate form and *M. a. obscurata*. This is a peculiar and significant detail, considering that the type-material of *M. stictothorax* was obtained within the range of *M. atrothorax melanura*, a paler-coloured representative which seems to have a marked chestnut cast on its upperparts. With a wide distribution on the southern bank of the Amazon, this subspecies occurs at Igarape Bravo (*c.* 2°24′S, 54°41′W), about 100 km away from the type-locality of *M. stictothorax* (Zimmer 1932, Meyer de Schauensee 1966), and also at other localities of eastern Amazonian Brazil such as Serra do Cachimbo (*c.* 9°00′S, 55°15′W), Conceiçåo do Araguaia (*c.* 8°15′S, 49°17′W), and Soure (*c.* 0°44′S, 48°31′W) on Marajó Island (Snethlage 1914, Pinto & Camargo 1957, Novaes 1958), contrary to what was mentioned by Schulenberg & Stotz (1991).

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Major concentration of River Warblers *Locustella fluviatilis* wintering in northern Botswana

by M. Herremans

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The River Warbler *Locustella fluviatilis* is an unobtrusive Palaearctic migrant, which enters northeastern Africa in September/October, but only continues to move through eastern Africa into southern Africa in late November and December (Dowsett 1972). Birds from late December to late January in southern Zambia were still on the move southwards (Dowsett 1972). The wintering* grounds of the species are still unknown: Zimbabwe and northern South Africa are suggested as the main wintering area (Dowsett 1972, Curry-Lindahl 1981), but there are very few records from these countries. Irwin (1981) mentions 7 scattered records from Zimbabwe and 5 have been accepted more recently (Hustler 1989, Hustler *et al.* 1990, 1991, Hustler pers. comm.). From the Transvaal there is one old specimen and a single accepted record (Tarboton *et al.* 1987), and more recently there are records from two localities, one involving several birds (Tarboton pers. comm., Hockey pers. comm.). There are two records from Botswana: one bird was seen during the 6th Pan-African Ornithological Congress in Francistown in March/April 1985 and a second one was at the same locality on 16 March 1989 (Botswana Bird Club Records Subcommittee pers. comm.). At the time of Dowsett's review there were no records available from February or early March, when River Warblers supposedly undergo a rapid moult at the final non-breeding destination (Dowsett 1972). D. J. Pearson more recently has provided evidence of wintering of River Warblers as far north as Kenya, where four were caught between 6 January and 25 March, three of which were moulting (Turner 1992).

Between 4 and 6 March 1992 River Warblers were found rather plentiful in the understory of the more open parts of the Rhodesian Teak *Baikiaea plurijuga* woodlands in the Kasane Forest Reserve, just

*The northern hemisphere biased term "wintering" is used in this paper for convenience, but the birds actually spend the local summer in the southern hemisphere.

south of Kasane, northern Botswana (30 minute-square 1725C). The birds were extremely skulking except for a few minutes at sunrise and sunset, when they all suddenly emerged into the top of the *Baphia* and *Bauhinia* scrub, apparently establishing territories by repeating the typical explosive *phit* call. River Warblers were present at a density of 7 birds per hectare near the camp, and twice 3 and once 4 per hectare were found at three other random places in the forest (up to 6 km away from the camp) where I happened to be at dawn or dusk, apparently the only right moment for a representative inventory. It also happened twice at two more sites during the day that two River Warblers started calling in response to a mobbing bird-party (possibly for a snake). Three birds near the camp were located repeatedly and each stayed within the same patch of scrub and long grasses, not moving more than 5 m during three days. When disturbed, the birds dropped to the ground and they were impossible to flush into mistnets. When confronted with a tape of the call, some birds eventually responded with a short burst of the 'squizzling' song. Two birds seen at very close range were in heavy moult, including remiges and rectrices.

Two of the sites in the Kasane Forest Reserve were revisited early in 1993. In the evening of 14 January, 4 River Warblers were located at dusk at the most remote count-point, the same number as in March 1992. The territorial response was poor and only one bird was seen at close range: there was no obvious sign of moult yet. Next evening, no River Warblers could be located near the previous year's camp site, but at this site the understory vegetation had not fully recovered from a fire in the dry season. It is likely that River Warblers were only just arriving in northern Botswana in mid-January 1993.

Although only 25 birds were actually located in the Kasane Forest Reserve, this is more than the total of all records known hitherto from the presumed final wintering grounds. Furthermore, the average density of River Warblers at the 4 random points with a representative count (4 per hectare) indicates that considerable numbers of this species must have wintered in the more open parts of the Teak woodlands, where there is a dense scrub cover interspersed with long grasses (*Hyperthelia dissoluta*, *Triraphis* spp., *Aristida* spp., *Eragrostris* spp.). At this density, River Warblers outnumbered all other species of Palaearctic warblers found in the area during a transect of 20 point-counts covering 35 ha (in 200 minutes): Willow Warbler *Phylloscopus trochilus*, 29 in 17 points=8/10 ha; Whitethroat *Sylvia communis*, 28 in 17 points=8/10 ha; Icterine Warbler *Hippolais icterina*, 19 in 12 points=5/10 ha; European Marsh Warbler *Acrocephalus palustris*, 11 in 7 points=3/10 ha; Garden Warbler *Sylvia borin*, 9 in 6 points=3/10 ha. However, when we consider that the woodlands are probably not ecologically uniform for the different species and that only the points where a species was recorded constitute habitat that warrants to be taken into account for a density calculation, the densities of all five warblers become remarkably similar (9–10 per 10 ha), though still clearly below the density of River Warblers. The only information on densities of River Warblers in southern Africa seems to be Kelsey (1992) who reported 2 birds resident in 8.5 ha in southern Zambia in

January/February, apparently also birds at the final non-breeding destination.

River Warblers were present in the Teak woodlands at a density higher than found for any Palaearctic warbler in any habitat in Botswana (Herremans 1993), but the species was not found during similar bird inventories in several other typical habitats of northern Botswana during February/March 1992: they were absent from the tall and moist grasslands of the Northern Plains (a seasonally inundated basin), from the thickets along the Chobe or Linyanti River-fronts, and from Mopane scrub and woodland in the Chobe district. The species therefore seems to have a clear preference for the understory of the Teak woodlands. However, a major part of these woodlands is burned yearly in the dry season and the habitat becomes only restored at the earliest one month after the first abundant rains, thus generally from late December onwards. The Teak woodlands grow on deep Kalahari sand and the soil conditions are always dry. The flush of new vegetation and foliage after heavy rains is so abundant that the woodlands in the wet season could be classified as 'moist bush and moist woodland', the habitat preferred by River Warblers as indicated by Pearson & Lack (1992). The habitat in the Teak woodlands also conforms to the predictions of what the wintering habitat should be by Dowsett (1972).

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The display of the Short-clawed Lark *Certhilauda chuana* and comments on the genus *Certhilauda*

by M. Herremans, N. D. Hunter & D. Allan

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The Short-clawed Lark is a resident endemic of southern Africa, restricted to *c.* 25,000 square kilometres subdivided between two geographical areas, one in southeastern Botswana and adjacent South Africa (south to the border region between the Transvaal, Orange Free State and northern Cape) and a second area on the Pietersburg plateau (Dean & Keith 1992). The species is one of the least known birds of southern Africa (Maclean 1985a) and most of its plumage characters have been appreciated correctly only recently (Newman 1983, 1989, Sinclair 1984, Clancey 1985, Hustler 1985, Hunter 1990, Robertson 1991, Dean & Keith 1992). The spectacular aerial display of the Short-clawed Lark has been described several times (Newman 1983, 1989, Sinclair 1984, Hunter 1990, Robertson 1991) and it is therefore very unfortunate that Dean & Keith (1992) ignored this knowledge. The Short-clawed and Long-billed *C. curvirostris* Larks are considered a superspecies currently placed in *Certhilaudis* (Hall & Moreau 1970, Clancey 1985, Dean & Keith 1992), in which the Karoo *C. albescens*, Dune *C. erythrochlamys* and Red *C. burra* Larks are also included (Dean & Keith 1992). Maclean (1969, 1985b), however, included all of these species in the genus *Mirafra*.

Observations of Short-clawed Larks were made for more than ten years in southeastern Botswana (NDH), where the species has been studied in detail since 1991 (MH). DA has observed Short-clawed and Long-billed Larks throughout South Africa for many years.

Display of the Short-clawed Lark

Male Short-clawed Larks frequently perform a spectacular aerial display flight during the breeding season to enhance territorial advertisement. The male flies off from a low bush or another slightly elevated perch and, after a rapid, low horizontal flight, suddenly ascends vertically. At 5 to 20 m high the bird stalls, nose-dives and descends vertically, with wings closed and tail slightly fanned. The wings are only opened again close to the ground, just before the bird alights. Occasionally, the bird does not land again and immediately repeats the display flight: up to four displays in a row have been observed. The descent is usually accompanied by a very high-pitched whistling call, *ooeeeeeee*. The height of the ascent seems to be related to the type of habitat: in very open vegetation 6–10 m is the norm, but in more dense *Acacia* bushveld males ascend above tree height, sometimes to over 20 m. The display flight of the Short-clawed Lark therefore is virtually identical to that of the Long-billed Lark (Macdonald 1952, Newman 1983, Sinclair 1984, Maclean 1985b, Hunter 1990). The Long-billed and Short-clawed Larks also give similar clear whistling vocalizations.

Sometimes the Shortclawed Lark makes a fluttering low flight (not accompanied by audible wing-claps) as an introduction to a terrestrial courtship of the female. The male then walks in deliberate small circles close to her with the chest thrown out, the wings drooped, the tail cocked up vertically, and the rufous rump-feathers raised. This display always preceded the copulations observed, though it was not always followed by copulation.

Discussion

Dean & Keith (1992) state that the male Short-clawed Lark "displays in fluttering flight with wings clapping; straight and on same plane, low down over dense 1 m tall grass". We cannot but assume that this is a mistake for another (probably *Mirafra*) lark, as there is very little in this description that can possibly fit the Short-clawed Lark. The typical nose-dive display has been described above and the species never makes any audible wing claps, nor does it occur in dense tall grass.

With the highly typical display flight of the Short-clawed Lark being re-appreciated, is there any further argument for close affinities in the genus *Certhilauda* (sensu Dean & Keith 1992)? No other southern African lark species make a display flight that resembles the distinct nose-dive of Short-clawed and Long-billed Larks. The long, pointed wings and long tail of these species possibly constitute essential morphological characters to enable the performance of this demanding acrobatic flight. The 'slimness index' of *curvirostris* and *chuana* is much higher than in the more bulky *Mirafra* larks (Table 1) and approaches the slimness of the larger *Anthus* pipits (*vaalensis*=2760, *leucophris*=2290 and *similis*=2482). Other slim-built African larks, e.g. Red-capped *Calandrella cinerea*, Dusky *Pynarocorys nigricans* and Rufous-rumped *P. erythropygia* Larks, have similar high indices, i.e. 1908, 2651 and 2396 respectively. Although we do not give any taxonomic weight *per se* to this index, we use it to quantify and stress an aspect of jizz and agility in these birds. Nevertheless, there is an urgent need for a detailed multivariate assessment of allometry in African larks, which is highly likely to reveal new, and strengthen current, insights into both eco-morphological and phylogenetic assemblages.

Measured on the scale of divergence in larks, the other species currently placed in *Certhilauda* have little in common with the *curvirostris/chuana* superspecies (Table 1). They all have the conical, mostly horn-coloured bills (typical of *Mirafra sensu largo*), build domed nests, perform cruising, fluttering and hovering display flights, and have a song structurally similar to the Fawn-coloured Lark *Mirafra africanoides*, a closely related slimly-built sandveld specialist (slimness index=1896). If *albescens, erythrochlamys* and *burra* represent anything other than well differentiated sand specialist *Mirafra* larks (the detailed evaluation of which is beyond the scope of this paper), then the generic name *Calendulauda* (Roberts 1936) is available for this assemblage. The

TABLE 1
Characteristics of some southern African lark taxa[1]

Genus/species	Nest	Song	Display/song flight	Bill	'Slimness'[2]
Mirafra	domed	variable, usually including mimicry	cruising, fluttering, hovering+wing-clapping in some species	conical, horn with dark rim	1483 ± 171[3]
albescens	domed	staccato introductory notes followed by buzzy bubbling; no mimicry	cruising, fluttering, hovering	thin conical, horn with dark rim	1647
erythrochlamys	domed	staccato introductory notes followed by buzzy bubbling; no mimicry	cruising, fluttering, hovering	thin conical, horn with dark rim	1918
burra	domed	staccato introductory notes followed by buzzy bubbling; no mimicry	cruising, fluttering, hovering	conical, horn with dark rim	2414
curvirostris	undomed[4]	clear whistles; no mimicry	vertical rise & stoop	long, mostly black (decurved)	2410
chuana	undomed[5]	clear whistles; no mimicry	vertical rise & stoop	long, mostly black	2347[6]
albofasciata	undomed	no mimicry	occasionally climb+dive/glide[7]	long, mostly black	1384

[1]We consider tongue-markings, nostril coverage, hind claw characteristics and diet poor taxonomic features to differentiate these lark genera.
[2]'Slimness index' = $(\text{Wing chord} \times \text{tail length})/(\text{Body mass})^{1/3}$; (only males); data from Dean & Hockey (1989) and Dean & Keith (1992).
[3]Ten species: *cantillans, passerina, albicauda, africana, ashi, angolensis, rufocinnamomea, apiata, africanoides* and *sabota*.
[4]We have no evidence for the statement by Dean & Keith (1992) that domed nests are known from the Long-billed Lark. We follow the evidence provided by D. Allan, W. Tarboton & C. Vernon in Hunter (1991);
[5]Hustler (1985), Herremans & Herremans (1992);
[6]+field data MH (6 males);
[7]Generally said to have no proper song flight (Maclean 1969, Jensen 1991), but aerial display recently observed (Herremans-Tonnoeyr & Herremans 1993).

superspecies *curvirostris/chuana* can be considered at least as distinct from all other southern African larks as is the Spike-heeled Lark (*albofasciata*), generally placed now in its own monotypic genus *Chersomanes*. We recommend restricting the use of *Certhilauda* to the *curvirostris/chuana* superspecies.

The three morphologically distinct assemblages into which the wide radiation of subspecies currently allocated to the Long-billed Lark can be classified (Dean & Keith 1992) also need more careful study. The very long-billed and heavily-marked birds, with long, straight hindclaws, may well constitute the species Long-billed Lark *sensu stricto*, while other races might constitute a third or even fourth *Certhilauda* species. Alternatively, some of the less marked, more rufous taxa, with shorter, straighter bills, might prove to be subspecies of *chuana*. The range of vocal dialects in *chuana* at least suggests this possibility (Herremans in prep.). The poorly-known eastern African Somali Lark (*somalica*), currently placed in *Mirafra* but originally described by Witherby (1903) as a *Certhilauda*, is morphologically indeed close to *Certhilauda* (*sensu stricto*) and may represent a cross-equatorial link to this genus. It also makes a short courtship flight, has long clear whistling vocalizations and builds an undomed nest (Archer & Godman 1961).

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On the taxonomy of the western Mediterranean islands populations of Subalpine Warbler *Sylvia cantillans*

by Gabriel Gargallo

Received 19 January 1993

The Subalpine Warbler *Sylvia cantillans* is a common breeding species in the Mediterranean Basin. Its European range extends from the Iberian Peninsula through southern France, most of Italy (including Sicily), coastal former Jugoslavia, Albania, southern Bulgaria and Greece to western Turkey; and from Morocco to Tunisia in North Africa (Peters 1986, Cramp 1992). The breeding range also includes the islands of Corsica, Sardinia, and Majorca and Cabrera in the Balearic Islands (Thibault 1983, Cramp 1992, Gargallo 1993). Three subspecies have been recognized: nominate *cantillans* in southwestern Europe from Italy westwards, including the western Mediterranean islands; *albistriata* from the former Jugoslavia eastwards; and *inornata* in North Africa (Vaurie 1959, Williamson 1976, Peters 1986).

There are no or only very slight subspecific differences in female plumage (Williamson 1976). Males, however, in spring plumage show distinctive features (Williamson 1976, Cramp 1992, Svensson 1992): the race *albistriata* differs from nominate *cantillans* and *inornata* by having a broader white moustachial streak, slightly darker upperparts, and a more chestnut-brown, less orange, throat and breast clearly demarcated from the more pure white belly and less coloured sides of belly and flanks; nominate *cantillans* has a reddish-orange (or pinkish-chestnut) colouration on the underparts extending farther down and to the sides, unlike *albistriata; inornata* differs from *cantillans* by having purer orange-coloured underparts.

We studied Subalpine Warblers during the spring and summer of 1992 on Illa de l'aire (Minorca), Cabrera and Majorca. We made field observations both on migrating birds and on several pairs breeding on Cabrera and at Cuber, Majorca; 49 birds were examined in the hand. In addition the plumage characters of different populations of Subalpine Warbler were examined at the British Museum (Natural History), Tring, and at the Museo Nacional de Ciencias Naturales, Madrid. Direct observations on the nominate race, *cantillans*, have been made routinely during the last few years in the Iberian Peninsula, and *albistriata* was studied in April 1992 at several localities in Greece.

While studying Subalpine Warblers in the Balearics, we found that all the males that we mist-netted or observed had clear light brownish-pink underparts without any or with very little orange or chestnut tinge, being thus very distinct from any other known race. Moreover, the call notes of these birds also differed strikingly from typical Subalpine Warblers, closely resembling the common call of the Wren *Troglodytes Troglodytes* and more slightly that of the Long-tailed Tit *Aegithalos caudatus*. This call was also uttered by females and juveniles, and was apparently a distinctive vocal feature of these populations.

This characteristic call has been also described for Corsican and Sardinian populations (Lemaire 1973, Bergmann 1976, Cody & Walter 1976, Thibault 1983). Moreover, Orlando (1937) described a new race of Subalpine Warbler from Sardinia, not accepted as such and included in nominate *cantillans* by subsequent authors (Vaurie 1959, Peters 1986, Williamson 1976), as having a dull rusty brown (*ruggine-sudicio*) instead of the typical reddish-chestnut or chestnut (*rosso-canella, rosso-castagno* or *castagno*) underparts. The type has not been located and so comparison is not possible; but although the meaning of any particular colour is very subjective and varies greatly from one observer to another, we think that the description of "dull rusty brown" underparts of Orlando's race refers to the same colour that we found in the Balearic Islands; moreover it is supported by the fact that the single adult male collected in the breeding season from Sardinia (there are no Corsican birds) in the skin collection of the BMNH has the same distinctive plumage features of Balearic populations.

In view of these resemblances in plumage colouration and vocal characteristics among the western Mediterranean island populations, and their distinctiveness from all other races, we propose that *Sylvia cantillans moltonii* Orlando, 1937, should be recognized as a valid subspecies.

Comparison of *S. c. moltonii* with other races

Biometry

Table 1 summarizes some biometrical characters measured on live birds of the different races of Subalpine Warbler. There is no information on the race *inornata*.

Subspecies *moltonii*, like *cantillans*, is clearly smaller than *albistriata*. Wing, tarsus and bill (from skull) measurements are significantly

TABLE 1
Mean values, standard deviations and range for four biometrical traits measured in three races of Subalpine Warbler (sexes combined, in mm)

	n	mean	s.d.	range	n	mean	s.d.	range
			wing				**tail**	
moltonii	29	60.1	1.09	57–63	26	53.4	1.54	49.5–57
cantillans	94	58.7	1.20	55.5–63.5	100	55.2	1.80	52–60
albistriata	11	62.5	1.24	60–64.5	11	55.1	1.45	52–57
			bill				**tarsus**	
moltonii	27	12.9	0.38	12.3–13.6	27	18.4	0.54	16.8–19.4
cantillans	92	12.9	0.43	11.6–14.0	93	18.6	0.49	17–20.9
albistriata	11	14.2	0.44	13.3–14.9	11	19.2	0.47	18.2–20.0

greater in *albistriata* (T-test: t=4.97, t=7.23 and t=22.37 respectively; P<0.01); there are no significant differences in tail length (T-test: t=1.94; P>0.05). Nominate *cantillans* has a shorter wing and longer tail than *moltonii* (both differences significant, T-test, t=4.66, t=2.69; P<0.01), but bill and tarsus lengths are similar (Table 1).

Published measurements of *cantillans* and *albistriata* (Williamson 1976, Cramp 1992) also support the size differences between these races. The differences in wing length that we have found between *cantillans* and *moltonii* may be the result of comparing birds of the race *cantillans* from a quite restricted area (mainly northeastern Iberian Peninsula); the wing length measurements given by Cramp (1992) for *cantillans* are very close to *moltonii*. The measurements of *inornata* given in Cramp (1992) are close to both *moltonii* and *cantillans*.

Plumage

In spring plumage, adult males of *moltonii* differ clearly from the other subspecies by having light brownish pink underparts instead of reddish-orange as in *cantillans*, more pure orange as in *inornata*, or chestnut as in *albistriata*. This colour extends, as in *cantillans* and *inornata*, to the sides of the belly and flanks, differing from the more restricted chestnut tinge of typical *albistriata*. Upperparts are paler grey than in *albistriata*, and slightly paler than in *cantillans* and *inornata*. The moustachial streak is rather thin, white in colour, sometimes with a slight pinkish tinge, not so conspicuous as in *cantillans* and much less than in *albistriata*. Females and juveniles seem inseparable from the other races.

After the postnuptial moult, the colouration of the underparts of males is greatly modified; the feathers of throat and breast have broad whitish tips and the pinkish colouration is very restricted, so that the subspecific features are less apparent in the field, though not in the hand.

Vocalizations

There are clear and distinctive differences in the usual contact-alarm calls of the races *moltonii, cantillans* and *albistriata* (Lemaire 1973,

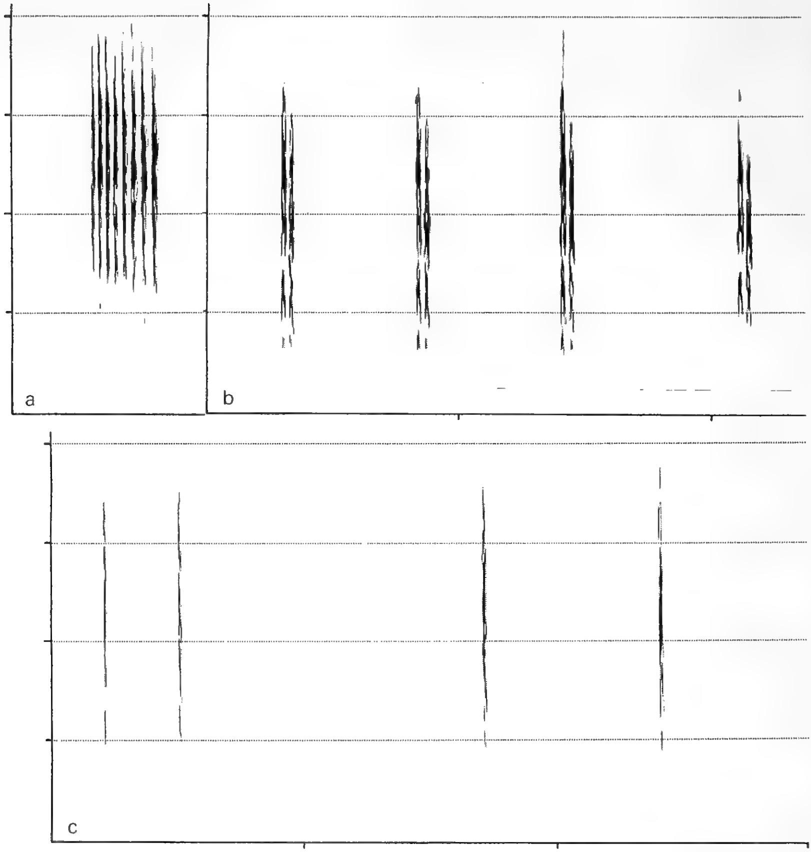

Figure 1. Sonagrams illustrating the differences in vocalizations between *moltonii*, *cantillans* and *albistriata*. Horizontal scale gives time in seconds; vertical scale 0–8 kHz. (a) *moltonii*. Recording by Gabriel Gargallo, Cabrera, Balearics, Spain, May 1992. (b) *albistriata*. Recording by Gabriel Gargallo, Brallos, Fokis, Greece, April 1992. (c) *cantillans*. Recording by José Luis Romero, La Roca, Barcelona, Spain, June 1991.

Bergmann 1976, Cramp 1992, *pers. obs.*; Fig. 1). Available recordings from northwestern Africa in the British Library of Wildlife Sounds (London) and those published in Cramp (1992) indicate that the call of *inornata* is similar to that of *cantillans*.

The call of *moltonii* (Fig. 1a) is a rather hard rattling *trrrrt* reminiscent of the typical call of the Wren *Troglodytes troglodytes*; it is a short strophe, 0.2–0.5 sec long, usually composed of 8–9 elements.

The call of *cantillans/inornata* (Fig. 1c) consists of a single short element, *tek*, usually continuously repeated at variable intervals according to the behavioural context.

The call of *albistriata* (Fig. 1b) consists of two elements *trek*, usually uttered in pairs or continuously when the bird is excited.

Calls that sound similar to *moltonii* have been found in Portugal and South Greece (H. Shirihai *in litt.*); however we, as Bergmann (1976), have never heard this call outside the range of *moltonii*. Rarely a *cantillans*-like *tek* may be uttered by *albistriata*, but always as part of the song or in a series of *trek-trek* notes.

Concluding remarks

In the present state of knowledge the breeding distribution of *moltonii* includes some of the Balearic Islands (Majorca and Cabrera), Sardinia and Corsica. Corsican populations are included since they have the same distinctive call, but we have not examined birds from this island for plumage features. Hence, the distribution of this subspecies seems to be restricted to some western Mediterranean islands. However, after checking the skin collection at the BMNH (Tring) we found two males of the race *moltonii* that had been collected from Tunisia and three from northwestern Italy. These birds, all collected in spring, might have been migrants passing through Tunisia or birds which had, accidentally, flown over Corsica. But we cannot completely reject the possibility that *moltonii* may breed in Tunisia and northwestern Italy. In fact we have not found any male of the race *inornata* among the specimens collected in Tunisia, neither at the BMNH (Tring), where there are only the two males above-mentioned, nor at the MNCN (Madrid) where the single specimen is a male of the race *moltonii* collected in May. Clearly we need more information to delineate a more precise distribution. Nevertheless, an island origin for this race seems probable, where isolation and insular ecological conditions could have allowed such a clear differentiation from the closely adjacent continental populations, both European and African. Some spread to limited parts of the mainland might have taken place subsequently.

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A *Haplospiza* finch in western México; the lessons of an enigma

by Flor C. Barajas L. & Allan R. Phillips

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Haplospiza is a small, mainly South American genus generally assigned to Emberizinae (if that subfamily is really distinct from *Fringilla*). One of these obscurely coloured, rather small finches, *H. unicolor* (supposedly monotypic), ranges from eastern Brazil south to northeasternmost Argentina, etc. The other, *H.* (*Spodiornis*) *rustica,* is the more northern (and western) species. It inhabits the Andes, east to Venezuela, reappearing (disjunctly and very locally) from western Panamá north and west to southernmost México near the Guatemalan border, with one old report farther north. Here it is notoriously difficult to find; the 3 El Salvador specimens "suggest that the species is at best a rare resident of the northern cordillera, and possibly no more than a vagrant" (Thurber *et al.* 1987). But no known population could yield such vagrants: in Honduras it is known from 2 specimens, from one locality (Monroe 1968); in Nicaragua from 1 (Martínez-Sánchez 1989); while it remains unreported from Guatemala (Land 1970). The "irregular, perhaps nomadic, seasonal movements" in Costa Rica (Stiles & Skutch 1989) surely do not reach or cross the Nicaraguan lowlands. Even in Costa Rica it is "Rare or very local", and it was never found there in the explorations of Carriker or of Slud (1964). There are hardly any accounts of its being seen in any numbers (Stiles & Hespenheide 1972). Wetmore *et al.* (1984: 582) aptly conclude: "Almost nothing is known of this species."

Well north of the Guatemalan border, there has long been an enigmatic record: the type of *H. r. uniformis* Sclater & Salvin, taken by R. Montes de Oca, supposedly at Xalapa, Veracruz. But Chapman (1898: 17) found that Montes de Oca's "Jalapa" meant little more than the state of Veracruz. Even this seemed rather dubious; no one else ever saw a *Haplospiza* in Veracruz, while Montes de Oca was once naturalist on the Mexican-Guatemalan border commission (Ferrari-Pérez 1886). But even if this was before he sent the type to Britain, we know of no other Chiapas birds labelled by him "Jalapa"; and it seems most unlikely that the only bird he took there would be such an extreme rarity. (See also section on the races of *H. rustica*, below.)

Western México, including Michoacán, is of course still farther from Central America, and more distinct faunally. Here, in recent years, F. Méndez G. and his students at the Universidad Michoacana de San Nicolás de Hidalgo have been conducting ecological studies and explorations. For her thesis, Barajas surveyed a slope that included a ranch at E1 Temazcal, 27 km east-southeast of Morelia at 2190 m altitude. The original pine-oak woods is now very perturbed; few trees remain, and the present vegetation is not unusual. Here, in the lower edge of a net set near ground-level by an unused, dry irrigation ditch on the hillside, 19 August 1982, she caught an obscure, streaked female finch. To our amazement, it proved to be a *Haplospiza*!

Continued efforts by F.C.B.L., and others at times, have failed to find any more *Haplospiza* anywhere in the vicinity. It remains the only record west of the far distant, biologically different, Isthmus of Tehuantepec.

Ecology

Wetmore *et al.*'s conclusion that "Almost nothing is known" summarizes *H. rustica*'s ecology well. Indeed, the extremely limited number of observations suggests that its preferred habitat (if uniform) may still be undiscovered. The Michoacán habitat comes nearest that on Cerro de la Muerte, Costa Rica, where one was netted (also in late August) "in thick, scrubby second growth in an area of partly-cleared oak forest .... No other *Spodiornis* was seen in the area, and the bird was probably a wandering individual" (Stiles & Hespenheide 1972). But the Michoacán habitat is more open and less scrubby (and wooded); while most evidence seems to point to a normal habitat at the edge of cloud forest.

Some hard-to-find tropical birds are seldom seen outside of bamboo thickets. But bamboo is absent here; the only vegetation at all resembling a bamboo thicket is a small patch of woody *Lasiacis nigra* (Paniaceae) at "El Salto", 1 km east-northeast of the El Temazcal ranch at 2240 m altitude. Here there persist traces of cloud forest, with *Clethra, Cornus,* and *Oreopanax* spp. (Bosque Mesófilo de Montaña; Takaki & Ibarra 1981). This type of vegetation is not widespread in the region, but is found in some *cañadas* (draws or canyons) mixed with oak-conifer woods, forming mosaics (Soto 1987).

Yet farther east in Pacific México, toward Central America, where cloud forest is better developed (southern Guerrero and even in Oaxaca; Binford 1989), *Haplospiza* remains undetected. In any case, its presence in unbroken cloud forest is unlikely. It apparently feeds entirely on vegetable matter (M. A. Ramos, notes; Stiles & Hespenheide 1972), especially grass seeds when available, near or at ground level. These would be scarcer within a closed forest than at openings.

At most times, these elusive birds must be extremely difficult to flush or see. The concentration of most records in August to November suggests post-breeding dispersal, as noted by Stiles & Skutch, or dispersal of young. But this is evidently not long-range; see section on the races of *H. rustica*, below.

Taxonomy

In the course of centuries, *Haplospiza*'s habitat is presumably very unstable. For considering its vast range and widely disjunct populations, *H. rustica* shows surprisingly little geographic variation. Principally, the bill becomes smaller, more slender, southward. (As in most highland birds, each main variation occurs at a major isthmus.)

At higher taxonomic levels, we see no reason to doubt that all its forms are conspecific, nor that they are congeneric with *H. unicolor*. Hellmayr (1938) retained for them the genus *Spodiornis* because of *H. unicolor*'s "thicker, basally more inflated bill and more pointed wing"—evidently a *lapsus*. He apparently overlooked Salvin & Godman's finding (quoted by Ridgway 1901) that the bill of *H. r. uniformis* is larger (not smaller) than *unicolor*'s; and he saw only one Middle American bird.

Presumably Hellmayr meant *H. unicolor*'s *less* pointed wing. Or perhaps he read Ridgway (1901) over-hastily. Ridgway evidently saw no *H. rustica* at all; preceding his account of *H.* [*r.*] *uniformis*, his generic description of *Haplospiza* is stated to be based on *H. unicolor*, whose wing was "rounded (seventh and sixth primaries longest, ninth shorter than fourth)". This difference is usually slight (except in the Berlin Museum type). Indeed, an anomalous "Brazil" ♂ (BM 57.11—28.232, *ex* Gould) has primary no. 9 almost as long as 5 (and 8 equal to, or a bit longer than, 6). Another old "Brazil" bird (MCZ 76789 [♀], *ex* Lafresnaye) also has the wings unusually pointed. (For acronyms here and below, see Acknowledgements.)

But in most *H. rustica* (including the Berlin Museum type), primary 9 is decidedly longer than 5, while 8 is (usually slightly) longer that 6. Thus *"Spodiornis"* has the more pointed wing, which is also longer: in ♂ chord >66 mm, *vs* <64 in most *unicolor* measured (once 66.5; USNM). The tail is narrower, less rounded, and more definitely notched in *rustica*; the central rectrices are 1–3 mm shorter than the longest.

The single definitely juvenile *unicolor* seen (FMNH) is pale below, mostly rather whitish, with olive-tinged wings and little rufescence. With so many known differences, we doubt that *unicolor* is "Possibly conspecific with *H. rustica*" (Paynter 1970).

The races of H. rustica

As is usual when males are bright or uniformly coloured, racial variation in colour is largely or entirely limited to females (and presumably unworn juveniles, when available).

Our ♀ gives the first hint of the colours of ♀ *uniformis*—if indeed of that race, as we must perforce suppose; its bill is very similar to the type's, carefully sketched for us by P. R. Colston. These two have the longest, most swollen bills, confirming the type's northern origin.

Should all the unknown, far-northern populations prove identical (a risky assumption), ♀ *uniformis* would have the most definite dark streaking on the back, extending onto the lower back. Other differences may be due to fresh plumage, recent collection, and/or individual variation. Its wing and tail are duskier than other ♀♀, and the back rather dark. Though less rufescent than Central America ♀♀, below and above—especially the rump, wing-bars and -edgings—it is more rufescent throughout than an El Triunfo, Chiapas, ♀ [INIREB] of almost identical date. (This is not due to "foxing"; F.C.B.L. used only corn meal and, later, arsenic powder in preparing the skin.) Both these 1982 ♀♀ have the longest row of under secondary-coverts grey, while in ♀♀ examined from Volcán Tacaná, on the Guatemalan border (MICH), to Costa Rica, they are white.

The range of *uniformis* was extended, long ago, to Chiapas (Brodkorb 1943, Miller & Moore 1954). This was a logical supposition; *Haplospiza* was unknown between México and Costa Rica, and *barrilesensis* of Panamá was considered dubiously separable from *uniformis* (its only character being supposedly smaller size). But Chiapas birds now seem no larger than Costa Rican in any respect. They do not have the long wing of ♂ *uniformis* (type), nor the large body of our ♀ (which unfortunately has neither weight nor body skeleton).

On the other side of the species' range, South American *rustica* have the bill small and slender. ♀♀ are darker on the rump than Mexican ♀♀ and duller (less brownish) on the longer upper tail-coverts. Only in fresh plumage do they show any rufescence on the tertials. They are less rufescent below than true *barrilesensis*, at least on the flanks.

Central American birds thus differ from other races in bill size, and from *uniformis* in smaller size (?) and presumably (Michoacán specimen) less definitely streaked ♀. Among themselves they are uniform in size and bill. But eventually, we believe, *barrilesensis* must be restricted to Costa Rica and western Panamá. Other ♀♀ (Chiapas, Honduras, etc.) are less reddish on the back, with more of a hint of dark streaking (in this approaching our ♀); they are also less rufescent on the crissum. But the chest is usually more rufescent, if the difference is not seasonal. The throat is slightly more streaked. (They are tawnier below than South American ♀♀, with the chest streaks a bit broader except for a South American juvenile.)

Though apparently distinctly smaller than *uniformis* (Fig. 1), this difference is poorly reflected in the appendages. Only the wings of ♂♂ are definitely smaller, and even these would probably overlap in a series.

The need of colour specifications

Obviously, cases like *Haplospiza* present extreme handicaps to an understanding of avian biodiversity. With a mere handful of specimens,

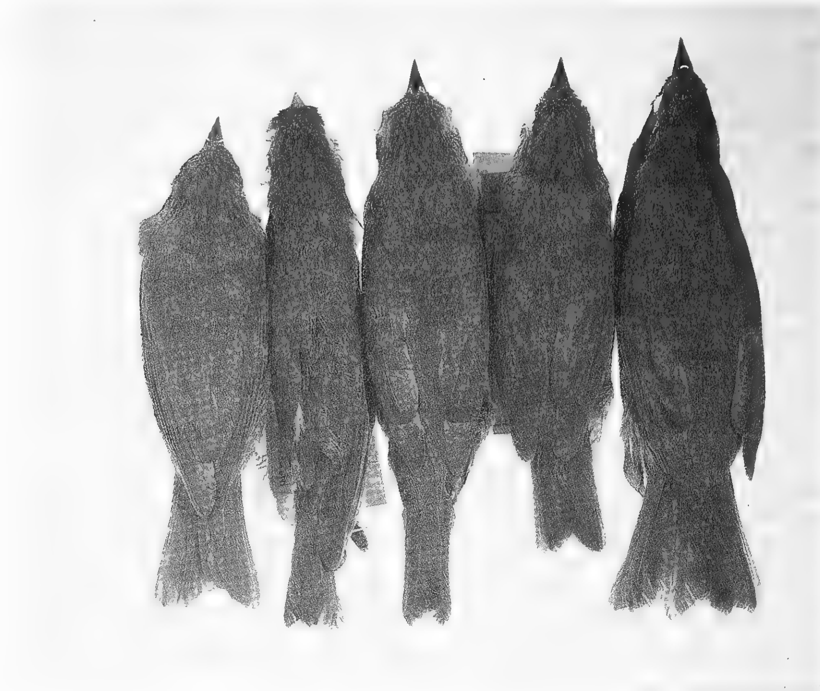

Figure 1. Comparison of our ♀ (far right) to other Middle American ♀♀; right to left: Volcán Tacaná, Chiapas (MICH "juv.", 21 March 1939); "Volcán Tacaná, Chiapas" (RTM); Montecristo, Santa Ana, El Salvador (AMNH, 26 November 1975); and southern Costa Rica (Talamanca Cordillera, AMNH, 4 May 1967).

mostly of unknown age, plumage, breeding condition (or at times even sex, when young), from far-scattered places, the meaning of the observed variations is uncertain. Some may even be due to wear and fading in life, or to post-mortem changes; rarely do we know what preservatives were used, or how carefully.

Widespread terrestrial birds (unless highly migratory) commonly vary geographically in size and colour, often dramatically: *Colinus virginianus, Motacilla* spp., *Ammodramus sandwichensis, Melospiza melodia*, etc. With elusive species like *Haplospiza*, our best chance to eventually understand their colour variations would be by promptly comparing any we may capture to detailed colour standards—just as we must compare, and preferably paint, species that fade rapidly after death (see for example Phillips & Rook 1965 and Phillips 1991 on *Catharus dryas*). We cannot safely foresee the amount of change. (Less obvious changes probably require direct comparison to fresh material, as shown for Pacific populations of *Vireo huttoni* by Rea, in Phillips 1991: 183–186.)

Our ♀'s rump, 2 years after collecting, was a slightly paled Olive of Ridgway (1912) (copy in Division of Birds, USNM). From near 30 Olive of Smithe (1975, 1981), it verged toward 29 Brownish Olive, or perhaps a paled 129 Dark Brownish Olive. (9 years after collecting, it is closest to 49 Greenish Olive but browner, *fide* M. R. Browning.) Compared to Munsell (1970), it was a deepened (2,5 Y [hue] × 5.0 Y) 4/4. The ground colour of the lower (adjacent) back was a deep, dulled 10.0 YR 4/4; the crown was still sootier, even the medial central part; the forehead was duller, less rufescent.

The back, in Ridgway, was a reddened Saccardo's Umber. (Nothing in Smithe was at all close; the back posteriorly was a bit more rufescent than mid-back, which was decidedly duller than 121A Prout's Brown.)

The flanks, on the Munsell scale, varied around a rather paled 4/2 (10.0 YR). The ground colour of the chest was a bit duller, paler than Central American ♀♀ but brighter than those from Perú, more washed with a dulled yYR 8/6 (=17.5) × Hue 7.5 8/6. Compared to Ridgway, they were dulled (greyed) Saccardo's Umber, while the chest was washed with a decidedly dulled Ochraceous Buff (× Chamois?); in Smithe this wash was between 223C Sayal Brown and 223D Tawny Olive.

Surely we cannot expect such detailed data to be pulished normally, on less spectacular range extensions or species one might collect for comparison (or find, recently taken, in some collection). But may we suggest the establishment of some colour centre for agreed-on difficult species, or new ones? Surely *Haplospiza* should be one of these. Thus we might eventually pay more than lip service to biodiversity, studying nature as it is (if habitats persist) rather than museum relics of uncertain value.

While detailed colours of soft parts (iris, mouth, bill, etc.) should also be recorded, in *Haplospiza* we see little evidence of geographic variation. Monroe (1968) suggested that "the Mexican race, *S. r. uniformis* . . . has a light-coloured lower mandible", but that this may be age variation. (Which age is dark, and which race inhabits Honduras, were never stated.) But *contra* Monroe, our ♀ had, in 1984, a distinctly blacker-grey mandible than less recent (1960s, 1970s) Central and South American ♂♂ and ♀♀. We also note the "pale horn" mandible of a Bolivian ♂ (FMNH) (A [♀] *unicolor*, MCZ, had mandible yellow-whitish below, its sides black.) Young birds and non-breeders may be darker, and bills may fade.

Skin and skeletal measurements

Despite the evidently large size of our ♀ (Fig. 1), available skin measurements of Mexican and Central American *Haplospiza* show mainly individual variation (Table 1). Presumably skeletons would be more instructive. In their absence, we must at least strive for standardized, reliable skin measurements, as little influenced as possible by the taker. Small measurements (bill, feet) in small birds must vary by a considerable % with different techniques and

TABLE 1
Measurements (mm) of *Haplospiza rustica*

Area (museum)	Wing chord	Tail	Flesh meas.: length	Flesh meas.: extent	Bill at nostril: width	Bill at nostril: depth	Wt. (g)
♀♀							
Michoacán (UMSNH) im. (?)	68.6	45.5	131	217	5.2	7.0	—
Chiapas (El Triunfo, INIREB)	68	45	121	207	5.2	6.8	16
Chiapas (Vol. Tacaná, MICH) juv.	68	46.5	—	—	5.3	6.7	—
same [?] (RTM)	65.7	45	—	—	4.9	6.0	—
El Salvador (AMNH)	67.5	45	—	—	5.1	—	—
same[1]	70	44	130	—	—	—	17
Costa Rica (Cachí, MCZ) [im.(?)]	67.6	45.9	—	—	—	—	—
Costa Rica (Talamanca Cordillera, AMNH)	69.3[+?]	47.7	—	—	5.0	6.7(−?)	—
♂♂							
uniformis (type, BM)	74	49.5	—	—	5.0[2]	6.0[2]	—
Chiapas (El Triunfo, INIREB) im.	70.3	45.5	135	214	5.2	6.5	17
Honduras (RTM), 2♂	68.7,72.2	47.3,47.8	—	—	—	—	—
Cost Rica (vol. Poás, MVZ) [ad.?] rear sk. windows	68.4	48.2 (1 rectrix 50.1)	—	—	—	—	15.4
Costa Rica (Navarro, AMNH)	71.7	48 (1 rectrix 50.5)	—	—	4.9	6.7	—
Costa Rica (Cachí, MCZ) [juv.]	69.9	47.4[+]	—	—	—	—	—
Panamá (Chiriquí, AMNH)	72	50.3	117	—	5.0	6.6	—
idem (*idem*) im.	70.5	47.5	120	—	—	—	16.7
idem (Chiriquí, USNM) [im.]	70.3	49.5 [+? 1 central rectrix missing]	—	—	—	—	—

Notes. Skin measurements by A.R.P. except as noted. A.R.P.'s measurements are averages, when the 2 wings differed or a specimen was measured on 2 occasions with slightly different results.
1 Measured by Thurber [*et al.*?]
2 Measured by P.R. Colston; bill forced shut

instruments, individual judgment of exact end-points, and position and curvature of dried toes (and proper closing of bills by preparators).

Larger measurements, too, have pitfalls. Tails may be shoved forward under the skin or lack a central rectrix (and the point of insertion is often hard to ascertain). Occasionally post-mortem drying may lengthen this measurement by 1 or 1.5 mm and shorten the wing.

Wing measurements vary chiefly with the technique used. The arc or flat wing depends on the pressures applied (and the completeness of drying). The chord should be reliable, if wings were not jammed forward into folds of skin, or distorted, shot, moulting, etc. But authors often fail to specify their methods, and may even mix them. Thus Miller & Moore (1954) obviously measured the chord, but compared their Chiapas ♀ ("64.7") to Brodkorb's flattened "69 mm".

Nor are measurements always reliable. We hardly suppose that Moore quietly changed his method in reporting (Moore & Medina 1957) wings of the 2 Honduras ♂♂ as 73.6 and 71.2 mm. While Monroe (1968) gave these as smaller (72.5, 69.0), this agrees only with A.R.P.'s measurements of the longer wing; in each case the other wing was still shorter, while Monroe's tail measurements (43.7, 45.6) are decidedly shorter than A.R.P.'s.

Reported measurements of a single bird's wing and tail may thus vary about 7.5% in Middle American *Haplospiza*. While this figure is seldom approached, caution is warranted. Errors in other cases have been still greater: two surprisingly long-winged Hermit Thrushes *Catharus guttatus* ("117, 121" mm; Miller 1955) were re-measured, at A.R.P.'s request, as 101.3 mm and 101.4 mm (Phillips 1991: 77; see also pp. 79–80, 86).

Obviously, the first step before taking a measurement should be to make sure that it is valid. But current bio-statistics ignores this. Thus the first specimen of a supposedly new swift appears as a female with a very short wing and tail in Navarro *et al*. 1992: 59; but A.R.P. had labelled it (10 July 1979) "♀ (?), im. ovary (?)", with all rectrices pin-feathers, wings in moult, and both length in flesh and extent (wingspan) therefore followed by a "[+]" sign. Clearly noone read the label or examined the feathers; but they gave full data on coefficients of variation, bootstrapped distributions, etc.

But standard skin measurements, even of full-grown *Haplospiza* etc., tell us less than the whole bird (weighed and uniformly measured in the flesh, before or after rigor mortis) and skeletal material. All this was neglected and discarded in the past, even in the case of the clearly unique type of *Edithornis sylvestris* Mayr (see Greenway 1973: 210, 316).

For comparability (repeatability), A.R.P. advocates and uses extreme measurements in the flesh, stretching the bird as far as possible without disarticulating any bones. Assuredly this seems ugly and unnatural, but we are scientists, not artists; variations due to individual judgments must be eliminated if possible in the study of biodiversity.

The extreme length is best read with the bird on its back on the ruler. But extent (wingspan) is easier to determine with the breast down. The primaries must retain their normal shape, without pressure; and the wing must not be flexed down toward the ruler, or back toward the body or tail.

This can be regular procedure; it is not unduly time-consuming or difficult. We need not await extraordinary opportunities to measure and preserve what we can; when in doubt, save—even unprepossessing ♀ finches. If they prove common, we have lost nothing.

The riddles of *Haplospiza*

In most birds, such an extraordinary extension of range would be immediately suspect. But in *Haplospiza* such anomalous records seem almost routine. Human transport, storms, or hurricanes cannot account for the 2 far-northern records (accepting Montes de Oca's). At the opposite end, there are now 3 reports of supposedly accidental *H. unicolor* in Buenos Aires province, Argentina (Di Giacomo & Di Giacomo 1991). In El Salvador, as cited above, it was suspected of being a vagrant only; yet the 3 El Salvador records exceed those of any nearby country. Outside of Costa Rica, only 2 Middle American areas have more than 3 records: adjacent western Panamá (Chiriquí) and the Sierra Madre de Chiapas, extreme southeastern México. And in Panamá, once more, there is an anomalous out-of-range specimen from the province of Panamá (Wetmore *et al.* 1984). (We omit here the unique type of *H. rustica arcana* [Wetmore & Phelps, Jr.] from Bolívar, Venezuela; ornithologists are even more "accidental" on Cerro Chimantá-tepui than *Haplospiza*.)

Normally, *Haplospiza* must be extraordinarily adept at hiding and avoiding the need to fly when approached. A.R.P. once witnessed such behaviour in an obviously different, undescribed Mexican bird he nearly stepped on; he could not tramp it up again in a small sloping opening (of probably ½ acre or less) with grass in rather small clumps, on a wooded hillside. Small wonder the nests, eggs, and small young of *Haplospiza* remain undescribed.

Besides the extraordinary difficulty of finding most *Haplospiza*, the variation in wing-formula is quite unexpected, if indeed all those in Brazil are of the same species and race.

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We thank the authorities of all these institutions. We are also indebted to M. R. Browning for re-comparing our specimen's rump and for help with references; to P. R. Colson for careful sketches, descriptions, and measurements of important specimens in BM; to M. A. Ramos for additional help; and to R. L. Zusi for photographing specimens. We thank F. Guevara F. for identifying the woody *Lasiacis*.

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On the validity of *Anumbius annumbi machrisi* Stager, 1959 (Furnariidae, Aves)

by Fernando Costa Straube

Received 26 January 1993

The Firewood-gatherer *Anumbius annumbi* is a widely distributed species in central and southern South America. It occurs from the Brazilian states of Tocantins, Goiás and Minas Gerais south to Rio Grande do Sul, as well as into Uruguay and eastern Argentina (Pinto 1978).

Three specimens of this species were collected near São João da Aliança (now in the state of Tocantins) and are the basis of a form that appeared to be a new subspecies *A. a. machrisi*, originally described by Stager (1959). This form was distinguished from the nominate race by the reduced number of black spots around the periphery of the white throat and distinctive streaking on the mantle and crown. The validity of this subspecies has been questioned (Pinto 1978, Vaurie 1980), but no detailed studies have been made.

I analysed 52 specimens of *A. annumbi* deposited in the ornithological collections of Museu de História Natural "Capão da Imbuia" (Curitiba), Museu Nacional (Rio de Janeiro, including the holotype of *A. a. machrisi* MN-32291), and Museu Paraense Emílio Goeldi (Belém). The specimens represent the entire range of the species and were collected from Tocantins, Goiás, Mato Grosso, Minas Gerais, São Paulo, Paraná, Santa Catarina, Rio Grande do Sul (Brazil) and Buenos Aires (Argentina).

Vaurie (1980) examined a series of 152 specimens and concluded that the two paratypes of *A. a. machrisi* "differ from birds from the other populations of the species in having the black spots surrounding the throat more reduced in number and size" and that "the other characters mentioned for this new form fall, however, within the range of individual variation of the other populations". I agree with Vaurie, but the pattern of gular spotting is also highly variable.

I examined a series of 21 specimens from Paraná (southern Brazil) and found that birds varied in three ways with respect to throat

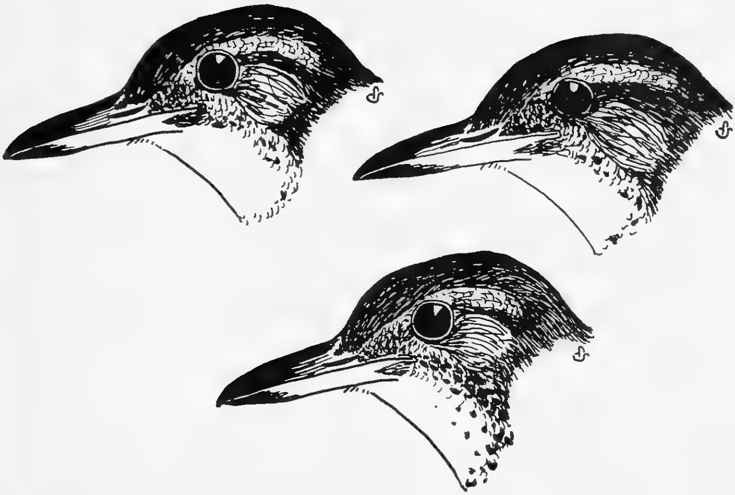

Figure 1. Sketches of three specimens of *Anumbius annumbi*, showing the black spots of the throat of two Paraná skins (upper right and bottom) and the holotype of *A. a. machrisi* (upper left) (drawings by the author).

markings. Some birds had large spots that were densely distributed on the throat; others had scattered spots on the sides of the throat; and still others had only a few small black spots at the base of the mandible (like the holotype of *A. a. machrisi*; see Fig. 1). The same degree of individual variation of black spots on a whitish throat occurs in other furnariids, e.g. *Clibanornis dendrocolaptoides*; this variation does not appear to be correlated with age or geographic range. In fact two specimens of *A. annumbi* collected on the same date and from the same locality have completely ossified skulls, enlarged gonads and very different patterns of throat spotting.

Additionally, I observed that two other characters used to distinguish *A. a. machrisi* were highly variable; the forehead is not always uniformly chestnut, and the mantle streaking is not less conspicuous than in the nominate race.

The only diagnostic difference I could find on the holotype was that the dark brown streakings on the crown were less conspicuous. Even this fieldmark differed among 8 specimens from one collection site in Goiás. In short, the crown streaks vary greatly in shape, number and colour in all parts of the range of this species. Thus, I conclude that *Anumbius annumbi machrisi* Stager, 1959 is a synonym of the monotypic species *Anumbius annumbi* (Vieillot, 1817).

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The austral races of the Afrotropical Fiery-necked Nightjar *Caprimulgus pectoralis* Cuvier, 1816

by P. A. Clancey

Received 8 February 1993

The two currently recognised subspecies of *Caprimulgus pectoralis* Cuvier, 1816, present in the southern parts of its range are the nominate race, the type-locality of which is George, southern Cape (*ex* Levaillant), and *C. p. fervidus* Sharpe, 1875, described from Damaraland, Namibia, on four C. J. Andersson specimens from the northeast of the territory. Unlike the nominate form, *fervidus* is seen as centred on a major biome, the extensive *Brachystegia* woodland savanna (Miombo) of south-central Africa, south of the Lower Guinea Forest. *C. pectoralis* affects moist woodland and forest edge, lies up in shade on the ground during the day, but seeks relatively open localities at dusk for feeding purposes. A third race, *C. (p.) nigriscapularis* Reichenow, named in 1893 from Songa, west of Lake Albert, eastern Zaire, represents the species in the main to the north of the Equator, reaching western Kenya and adjacent Uganda. Some workers, notably Fry & Harwin (1988), but see also Louette (1990), give it separate species rank, and it is, accordingly, not dealt with in the present contribution.

During nidification, *C. p. fervidus* is sympatric with northern elements of the strongly migratory Rufous-cheeked Nightjar *C. rufigena* A. Smith, 1845, which sojourns (April–September) in the savanna belt of the northern Afrotropics, whereas *C. p. pectoralis* and *C. p. fervidus* are only given to short-range movements and are environmentally more mesic than *rufigena*, which, certainly on its breeding grounds, favours desertic or semi-desertic conditions. Also occurring alongside these two comparably-sized species is the Mozambique Nightjar *C. fossii* Hartlaub, 1857, which has an austral distribution somewhat analogous to that of *C. pectoralis*, but is still more prone than it to local movements and short-term concentrations. It has been customary to view *C. pectoralis* as a resident nightjar, but it is now well-established that it is subject to rain-front and post-breeding related population shifts, resulting in both localized temporary absences and influxes. Support for this conclusion is furnished by Jackson (1978) and Irwin (1981) who record that in Zimbabwe the species breeds in August–December (63 records) and that later, from November, there is a major exodus of the local population. For Zambia, Benson *et al.* (1971) give comparable breeding times, with peak abundance in the upper Kafue R. basin in April, long after breeding; later and immediately in advance of breeding, concentrations (of returning migrants?) have been noted from Mongu in the west to Chipata in the east.

In South Africa, Maclean (1985) also records seasonal relocation of numbers from the eastern lowlands to the plateau (November–April), the basis of which is debatable, as the dates do not accord with the breeding season given by the same author for the region as a whole. All southern populations of the Fiery-necked Nightjar breeding to the south of 14°S lay from late July or August through to late November and early December, concentrations at other times resulting from rain-front withdrawal movements and short-range migrations. That there is some variability in movement patterns from year to year is clear, as Kemp *et al.* (1985) comment that on the plateau of the Transvaal (at Nylsvley, near Nylstroom) the present nightjar is "common some years and unrecorded in others", comparable irregularity of incidence being likewise recorded from Natal localities. While available data are somewhat inconclusive, it can be postulated that in years of particularly high rainfall local conditions may be temporarily rendered unsuitable for breeding, necessitating a shift to more open and perhaps drier plateau habitats. The breeding season is essentially correlated with the terminal stages of the dry season in the southern Afrotropics and the commencement of the main rains.

Current inadequate understanding of the extent and disposition of the species' post-breeding movements, and particularly the characters and distribution of *C. p. fervidus*, gave rise to the present enquiry. This has shown incontrovertibly that *fervidus* is composite and requires to be re-arranged in three rather than a single subspecies, for one of which a new name is introduced below.

Individual variation is extensive, but the broad general patterns of geographically based variation are not in question, affecting overall colouration, the extent and brightness of the light hind neck-bar, the colour of the ear-coverts, malar streaks, fore-throat and breast, and degree of barring to the underside. Both sexes vary widely in size, with much overlap in size between populations, but with the incidence of short-tailed birds increasing significantly in the east of the range in association with low altitude and perhaps the high level of summer daytime temperatures.

TABLE 1
Wing- and tail-length parameters (in mm) in the four subspecies of the Fiery-necked Nightjar *Caprimulgus pectoralis*

			Wings			Tails		
		n	range	mean	s.d.	range	mean	s.d.
pectoralis	♂♂	12	158–174.5	165.3	5.18	110.5–131	122.7	5.86
	♀♀	10	157–170	161.1	4.71	115–128.5	123.0	3.79
crepusculans	♂♂	12	152–172	160.7	4.99	110–130.5	119.2	6.29
	♀♀	10	153–163	158.1	3.10	110–121	114.6	3.18
fervidus	♂♂	12	158–171.5	164.7	4.46	115–127	121.1	3.99
	♀♀	10	159–172	164.8	4.46	119–127	122.6	2.90
shelleyi	♂♀	10	160–177	168.2	4.66	115–132	123.8	4.56

Notes. It will be appreciated that there is little meaningful size-difference between the sexes in *C. pectoralis*, both structures dealt with varying widely. Variation in size of taxonomic import is to be found in the eastern humid littoral *C. p. crepusculans*, in which the incidence of individual birds with the tail-length 120 mm and below is well in excess of that in the other southern races. Louette (1990) shows *C. (p.) nigriscapularis* is still shorter-tailed than *crepusculans*, with 13 ♂♀ from both eastern and western Zaire having wings 147–158.5, and tails 104–115 mm. The white rectricial apices are also smaller. In the case of the Shaba, Zaire, population herein dealt with as part of *C. p. shelleyi*, Louette gives the wings of 10 ♂♂ as 155–164.5 (160.0), tails 107–129 (118.2), wings of 11 ♀♀ 146–162.5 (158.0), tails of 10 109–123.5 (115.5) mm.

From my recent review of the forms of *C. pectoralis, sensu stricto*, and their seasonal movements, I now recognise four subspecies, as set out below.

Caprimulgus pectoralis pectoralis Cuvier

Caprimulgus pectoralis Cuvier, *Règne Anim.*, vol. i, 1816, p. 376: Africa, based on Levaillant, pl. 49=George, southern Cape. Synonyms: *Caprimulgus africanus* Stephens, 1817; *Caprimulgus atrovarius* Sundevall, 1851.

Over upper-parts generally Deep Mouse Gray (Ridgway 1912), finely vermiculated with darker grey, the medial crown broadly streaked with black and hind-neck with narrow bar of buff. Scapulars boldly marked with jet black subapical segments, edged with buff. Ear-coverts, malar streaks and fore-throat Bone Brown to blackish-brown, the feathers finely sub-terminally banded with cream-buff; lateral throat panels white, the caudad feathers broadly tipped with black; breast similar to fore-throat, i.e. relatively dusky, vermiculated and finely barred with buff and washed with umber brown; rest of ventral surface Cinnamon-Buff transversely barred with dark brown, extending to flanks and crissal surfaces.

Measurements. See Table 1. In a series of 22 ♂♀ from the Cape 27% had tails of 120 mm or less.

Range. Western Cape from northern Little Namaqualand to the Cape of Good Hope, east generally south of the Great Karoo to the eastern

Cape, adjacent interior Transkei and southwestern Orange Free State (on the Orange R.). Partially migratory, ranging after breeding from *c.* April/May to Natal, lowlands of Zululand, eastern Transvaal, southeastern Zimbabwe, with one from Nangweshi, Barotse Province, Zambia (16°22′S, 23°18′E), dated 16 July 1952. Return movement from about early September. Southern and southeastern Cape specimens taken May–September (18 out of a series of 27) confirm post-breeding emigration is only partial.

Remarks. Relatively cold greyish tone to upper-parts, narrow buffy hind neck-bar, heavy black coronal streaking and spotting to scapulars, as well as blackish-brown ear-coverts, fore-throat and breast surfaces and broad ventral barring distinguish this race.

Grant & Mackworth-Praed (1954) discuss this subspecies on the basis of the material then available in the British Museum (Nat. Hist.) collection, recording that a specimen from Ulundi in Zululand is seen as referable to it. They were seemingly unaware of the post-breeding movements of both nominate *pectoralis* and other races, which can result in the taking of two or more different forms in the same general area.

Caprimulgus pectoralis crepusculans subsp. nov.

Type. ♂ adult. On road to Charters Creek, near Hlabisa, Lake St. Lucia, eastern Zululand, sea level, 6 April 1979. Road casualty (*ex* Natal Parks Board). In the collection of the Durban Natural Science Museum, Mus. Reg. No. 32 603.

Description. Compared with *C. p. pectoralis* lighter over upper-parts, ground-colour more cryptic ochraceous-buff, not cold grey brownish-black, coronal shaft-streaking appreciably narrower, and with small black buff-tipped segments to scapulars; hind neck-bar rather broader, more reddish in colour but with deep buff shaft-streaking. On underside with ear-coverts, malar streaks, fore-throat and breast much lighter, less dark greyish, approaching Dresden Brown, breast transversely vermiculated with dusky and buff; rest of underside paler buff, with finer barring, which declines markedly over flanks and crissal surfaces, which are mainly plain. Wings more warmly tinged with reddish-buff, lesser-coverts less blackish. Tail frequently more coarsely banded and vermiculated with brownish-black. Similar in size to nominate race, but tail tending to be shorter (120 mm or less in 73% of 22 ♂♀). Measurements of type: wing (flattened) 161, tail 120 mm. See Table 1.

Material examined. 30. *Natal*: Kokstad, Ixopo, Pietermaritzburg, Durban; *Zululand*: Maphumulo Game Reserve, Hluhluwe Game Reserve, Lake St Lucia, Hlabisa, Gwaliweni Forest (Ingwavuma), Ndumu Game Reserve; *Swaziland*: Umbuluzi Game Reserve (*c.* 26°30′S, 32°00′E): *Transvaal*: Mokeetsi, Louis Trichardt, Sebasa; *Mozambique*: Bela Vista, Chimonzo, Chicumbane, Panda, Rumbaçaça, Inhaminga, Muxe; *Zimbabwe*: Humani Ranch (20°30″s, 32°16′E), Sentinel Ranch (22°09′S, 29°28′E).

Range. Midlands and coast of Transkei to Natal and Zululand, eastern Swaziland, eastern lowveld of Transvaal, southeastern lowlands

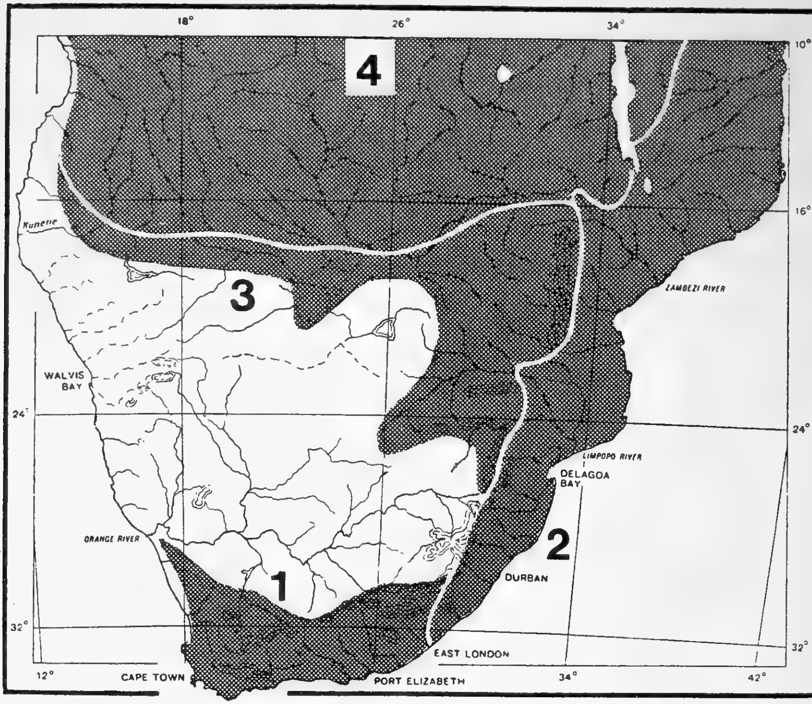

Figure 1. Breeding ranges in southern Africa of the races of the Fiery-necked Nightjar *Caprimulgus pectoralis:* 1, *C. p. pectoralis;* 2, *C. p. crepusculans;* 3, *C. p. fervidus;* 4, *C. p. shelleyi*.

of Zimbabwe (e.g. lower Sabi R. valley), and Mozambique. Northern limits not determined, but probably also southeastern lowland Tanzania. Largely sedentary. Breeds late August–December.

Etymology. *Crepusculans* from Latin, of dusk, i.e. active at sundown or before daybreak, and in the half light of moon-lit nights.

Remarks. The Zululand topotypical population of *crepusculans* is seasonally (May to late August/September) greatly outnumbered by wintering examples of nominate *pectoralis* from further south. McLachlan & Liversidge (1970) record that eggs of what they refer to as *C. p. fervidus* (but probably=*C. p. crepusculans*) are smaller than those of nominate *C. pectoralis*: 23–27.2 × 18–19.4 (n=6), *versus* 29.8 × 20.5 and 28.8 × 20 (n=2) mm.

Caprimulgus pectoralis fervidus Sharpe

Caprimulgus fervidus Sharpe, in Layard & Sharpe's *Birds of South Africa*, new ed., 1875, p. 86: "Damaraland"=Owamboland (Ovamboland), northern Namibia.

(*Note.* The paratypical series of four specimens collected by C. J. Andersson was taken in Owamboland, Otjoro, at Elephant Vlei (*c* 18°S, 18°E), and "between Owamboland and the Omuramba Omatako" in the northeast of Namibia in 1859.)

Dorsally similar to *C. p. crepusculans*, but ranging paler, this most marked over sides of crown, caudad scapulars and tertials. Black mid-coronal shaft-streaking coarse, and as in nominate *pectoralis*, but sharply edged bright tawny; hind neck-bar broader, lighter and more orange-tawny, the fiery effect heightened by the wider light buff shaft-streaks and tips; mantle and lower back to rump overlaid with tawny, which colour also bleeds into upper tail-coverts and wings (in *crepusculans* the dorsal surface behind the hind neck-bar lacks any tawny suffusion). Differs sharply in having ear-coverts, malar streaks, entire fore-throat and upper breast more or less plain Tawny/Russet, and in reduced light brown vermicular barring on lower breast; rest of underside with still less barring than in *crepusculans*. Wings and tail lighter.

Measurements. See Table 1. Size similar to nominate *pectoralis*; 59% of 22 ♂♀ with tail 120 mm or less.

Range. Southwestern and southern Angola to the south of the Miombo woodland savanna, northern Namibia to north and northeast of the Etosha National Park, east to Kavango and the Caprivi Strip, northern and eastern Botswana, the plateau of Zimbabwe and the western and northern Transvaal to the north of the highveld. Migratory with post-breeding movements seemingly northerly oriented and centred on the south- and east-central African tropics, but precise disposition uncertain, though reaching northern Zambia, southeastern Zaire and Tanzania. Louette (1990) refers to a "rufous morph" from Kinshasa, Lower Zaire, which probably represents *C. p. fervidus* as here defined.

Remarks. Contrary to statements in the standard literature, this race is not largely restricted to the Miombo savanna, as much of the range outlined above lies beyond the Miombo limits. Its general colour suggests a desertic or semi-desertic origin, its currently extended, tenuous and somewhat peripheral range being possibly a secondary outcome of competition with the more xeric *C. rufigena* at some stage in the past. The two nightjar species are closely similar in general appearance and have been consistently confused, even by one as knowledgeable as Reichenow (1900–1901). The paratypical series of *C. p. fervidus* in the collection of the Natural History Museum, Tring, is subspecifically composite, with an Elephant Vlei specimen dated 29 October 1859 an example of *C. p. shelleyi*, as recognised hereunder.

It is of no small evolutionary significance that virtually the entire range of *C. p. fervidus* as here determined is in effect the zone of breeding sympatry of *C. pectoralis* and *C. rufigena*, in which the former species is even more extensively and intensely rufescent than its congener over the lateral and hind surfaces of the head, fore-throat and breast.

Caprimulgus pectoralis shelleyi Bocage

Caprimulgus Shelleyi Bocage, *Jorn. Acad. Sci. Lisboa*, vol. xxiv, 1879, p. 266: Caconda, northern Huila, Angola.

Nyctisyrigmus kwalensis Davis, *Pan American Studies*, vol. i, 2, 1978, p. 266: Kwale, south-eastern Kenya, at 4°10'S, 39°27'E. *Nomen nudum* (see comment below).

Somewhat similar to nominate *pectoralis* over upper-parts, differing in the neck-bar being broader and with redder ground-colour; broad shaft-streaking light buff. Cheeks, malar streaks, fore-throat and breast lighter and browner, much less dusky, i.e., not blackish Bone Brown, and with transverse ventral barring restricted to lateral lower breast; adjacent sides, flanks and crissal surfaces plain buff.

Compared with *C. p. fervidus*, with ear-coverts to malar streaks, fore-throat and breast variegated fuscous brown and buffy, not plain Tawny/Russet, and upper-parts duller, without an extension of tawny overlay to the mantle, rump and upper tail-coverts; longer scapulars and tertials less pallid. Underside with the buff of the breast duller, the lower barring as described in the case of *fervidus*.

Measurements. See Table 1. Similar in size to nominate *pectoralis*, but only 1 of 10 ♂♀ measured with tail less than 120 mm. Rosa Pinto (1983) gives the following measurements of 60 Angolan specimens, most of which were from populations of *C. p. shelleyi* judging by the localities listed in the general text: wings of ♂♀ 157–177, tails 116–136 mm. Weights 42–63 g. It will be noticed that these measurements range greater than those given here for nominate *pectoralis, crepusculans* and *fervidus*.

Range. The plateau of Angola, southern Zaire to the south of the Lower Guinea Forest, Zambia, northern Malawi and southwestern Tanzania. Post-breeding movements in these populations uncertain, but with evidence of some southward, possibly rain-front motivated, occurrence to northern Namibia, northern Botswana, and northwestern Zimbabwe (Mica Hills, near Dett, 1 August 1930).

Remarks. Despite its well-marked characters, *C. p. shelleyi* has never been discussed in the literature, the populations now grouped under it being invariably treated as *C. p. fervidus* and even *C. rufigena*.

Comment on *Nyctisyrigmus kwalensis* Davis, 1978. This proposed additional species of Afrotropical nightjar, named in a privately published journal entitled *Pan American Studies*, is based on a single recording made by G. Stuart Keith at Kwale, south-eastern Kenya, in 1961, and made available to Davis by the late Myles E. W. North; the spectrogram reproduced on p. 48 of Davis's second paper on nightjars in *Pan American Studies*, shown alongside one claimed to be of *C. p. fervidus*, agrees closely in pattern with it, even if very badly faded.

This name, notwithstanding having been based on a song recording, is seemingly valid in terms of Article 23 (f) of the *International Code of Zoological Nomenclature* of 1985. This mandates "that names established on any part or form of an animal or on its works", continues under (i) "even if any part of an animal is named before the whole animal", are available. This can be construed to include a diagnostic vocalisation, even if a recorded version of it. Be that as it may, *N. kwalensis* cannot reliably be used subspecifically and requires to be treated as a *nomen nudum* in line with the views of Vuilleumier *et al.* (1992).

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I am indebted to P. R. Colston, Natural History Museum, Tring for the loan of part of the paratypical series of *Caprimulgus fervidus* Sharpe of 1875. The series in the East London and Transvaal Museums were kindly made available through their resident ornithologists, while H. D. Jackson, now of Auckland, New Zealand, helped with the provision of copies of obscure literature on African nightjars. To all concerned I tender my sincere thanks.

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Avifaunistic results of a subtropical camp in the Cordillera del Condor, southeastern Ecuador

by Niels Krabbe & Francisco Sornoza M.

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Previous ornithological work in the higher parts of the Cordillera del Condor has been confined to the southern (Peruvian) end, where joint field parties from Princeton University and Louisiana State University in the 1970s visited areas between 1900 and 2400 m near San José de Lourdes, Department of Cajamarca (Fitzpatrick *et al.* 1977, 1979, Fitzpatrick & O'Neill 1979, 1986). They never published their complete species list, but their list was used by Robbins *et al*. (1987) for making comparative lists of differences between the avifaunas of the Cordillera del Condor and the mountains immediately to the north (Cordillera de Cutucú) and southwest (Cerro Chinguela). During the late 1980s the Western Foundation for Vertebrate Zoology made a large (still unpublished) collection of birds from the upper tropical zone in various Ecuadorean parts of the Cordillera del Condor. However, the higher parts of the central and northern end of the range remained unexplored. We report here the results of an expedition to near the crest of the middle portion of the mountain chain. The first records were obtained of three species for Ecuador. A comparison with the avifauna of the cordillera de Cutucú reveals even greater similarity than previously suggested.

General description of the region

The Cordillera del Condor is a semi-isolated mountain-range separated from the main Andean chain to the west by the Río Zamora valley. The northern end of the mountains is especially isolated by a pass less than 1500 m in elevation. The range has a large number of peaks and ridges with steep slopes, and is entirely covered with humid forest. The soil in the area visited was composed of reddish-brown, orange or in a few places greyish clay mixed with gravel and sand, and with little or no stratification. Above San José de Lourdes in Peru the soil is of bleached quartz sand, and this area also differs from the more northerly parts by being in close proximity to the arid Marañón valley. Along the western base of the central Cordillera del Condor, forest clearance is nearly complete up to an elevation of about 1200 m, while the forest appears to be almost entirely intact above that elevation.

Sites and methods

From 8 to 24 September 1990 the authors investigated a ridge at 1700 m on the west slope near the top of the Cordillera, which here only reaches 1900 m. The study site covered *c*. 2 ha, and was situated between La Punta and Chinapinza at *c*. 04°00′S 78°34′W. The crest of the knife-like ridge studied seemed to have a cooler microclimate than the immediately adjacent slopes, with vegetation only two metres high and covered with *Sphagnum* and other mosses, thus much resembling the vegetation on the crest of the Cordillera del Cutucú (see Robbins *et al*. 1987). On the steeper slopes of the study area trees grew only 10–20 m high, while on the moderately steep slopes some trees were 30 m or even taller. A few small patches of bamboo were present. According to local people at Paquisha, September is the driest time of the year, and we experienced but four rainy days during our two weeks of work, most days being sunny with clear skies. This contrasts with published results from Zamora (970 m) some 50 km west-southwest of Paquisha, where rainfall peaks in March, September, and early January, lows being in February, July and November (Cañadas 1983). Temperatures at the camp at 1700 m ranged from 10–13°C at night to 15–24°C by day.

The work included tape-recording of vocalizations, uninterrupted for 10–20 minutes at dawn as well as for shorter periods at various times of the day, and the collecting of blood-samples and study-skins. Measures of abundance were obtained by using vocal data as well as captures and sightings, and they may thus not reflect true density. Song activity was generally low during the study, so several species undoubtedly went unencountered. On the other hand the tanagers were not as secretive as during nesting, so they were probably well-recorded. The specimens taken were secured with a combined length of 207 m of mist-nets from dawn to dusk, and fire-arms. Sound-recordings are deposited with Bioakustisk Laboratorium, Århus University, Denmark, and British Library of Wildlife Sounds, London; study-skins in Museo Ecuatoriano de Ciencias Naturales, Quito, Academy of Natural Sciences, Philadelphia, and Zoological Museum, University of Copenhagen; blood-samples for DNA studies in the latter institution.

Survey results

Altogether 114 species were recorded in the study area, 192 specimens of 85 species were taken as study skins, and 178 blood samples were extracted. The species recorded are listed in the appendix. Except for recently described species, taxonomy and nomenclature follow Meyer de Schauensee (1970). The following deserve special attention.

WHITE-BREASTED PARAKEET *Pyrrhura albipectus*

What was presumed to be the same flock of five birds was observed feeding daily near the camp, and a few times two other flocks of five and twelve birds, respectively, visited the area briefly. All birds seen were in similar, adult plumage. Five identifications of food-plants were all of the inflorescences of a slender, woody vine *Piptocarpha* cf. *poeppigiana* (Compositae). This vine climbs young trees, and in some cases the parrots would climb down as low as 1–2 m above the ground to feed. Two specimens had stomachs crammed with these flowers. Usually the flock seemed indifferent to human presence and allowed close approach. The species was previously known only from tall humid forest and second growth in Cordillera de Cutucú and the region above (west of) Zamora (Robbins *et al.* 1987), and from an unpublished specimen (WFVZ) taken further south in Cordillera del Condor at Pachicutza, 1000 m (*c.* 04°08'S 78°40'W), in August 1989 (M. Marín verbally 1991). In view of its distribution over a length of 200 km in the relatively untouched Cordilleras de Cutucú and del Condor it should probably not be considered immediately threatened as feared by Collar & Andrew (1988).

Specimen data: adult ♀ (ANSP 183065; blood sample NK12-19.9.90) 77.3 g, ovary granular, tail worn, wings fresh; adult ♀ (MECN; NK1-13.9.90) 83 g, ovary medium, oviduct curled, plumage fresh.

CINNAMON SCREECH-OWL *Otus petersoni*

Despite almost nightly owl-hunts this was the only owl recorded at our camp. It was remarkably common, and no less than four singing males were collected from the same few trees during the two weeks. Three stomachs were full of insects, mainly large beetles. The previously published four localities are in southeastern Ecuador and on both sides of the Río Marañón in northern Peru (Fitzpatrick & O'Neill 1986). It may be found to range northwards into Colombia, as suggested by an old "Bogotá" trade skin (ANSP).

Specimen data: ♂ (ANSP 183100; NK11-20.9.90) 102 g, testes medium-small, plumage fairly grey; ♂ (MECN; NK17-17.9.90) 99 g, testes medium, plumage very red; ♂ (MECN; NK9-10.9.90) 105 g, testes medium, plumage intermediate.

BUFF-BROWED FOLIAGE-GLEANER *Syndactyla rufosuperciliata*

Two specimens taken at 1700 m represent the first records for Ecuador. The species was previously known north to the southern end of Cordillera del Condor (Robbins *et al.* 1987) and Cerro Chinguela in northern Peru, where it was found at 2250–2450 m (Parker *et al.* 1985). The closely related Lineated Foliage-gleaner *Syndactyla subalaris* was captured in the same nets at our camp. Although ranging as high as 2600 m in the northern part of its range, *subalaris* replaces *rufosuperciliata* at lower elevations where the two coexist from Cordillera del Condor to central Peru (Parker *et al.* 1985, Fjeldså & Krabbe 1990).

Specimen data: ♀ (ANSP; NK5-16.9.90) 32.5 g, skull ossified, ovary active; ♂ (MECN; NK4-14.9.90) 30.3 g, skull 75% ossified, testes enlarged.

CINNAMON-BREASTED TODY-TYRANT *Hemitriccus cinnamomeipectus*

This poorly known and recently described species was previously known from 1800–2200 m at three localities on both sides of Río Marañón in northern Peru (Fitzpatrick & O'Neill 1979). One was observed singing at 0700 hrs in the two metre tall vegetation on the mossy ridge at our camp. It sang hidden at midheight and appeared to defend a territory *c.* 15 m long (the length of this isolated patch of habitat). The bird, an adult male, responded vigorously to playback of its song. It was collected, and later a female and two other males were netted at the same spot. These specimens represent the first record of the species in Ecuador and double the length of the known range to some 200 km. The habitat closely resembles that at 2100 m on the crest of Cordillera de Cutucú, where the Black-throated Tody-tyrant *H. granadensis* is fairly common. The two may have very similar ecologies. Both are found at *c.* 2200 m near Abra Patricia, Departments of Amazonas and San Martín, Peru (Fitzpatrick & O'Neill 1979, Davis 1986), but *granadensis* generally occurs at higher elevations.

Specimen data: ♀ (MECN; NK4-13.9.90) 7.3 g, skull 30% ossified, ovary granular, oviduct curled, stomach-content tiny insects (saved); ♂ (MECN; NK1-12.9.90) 9.2 g, skull 40% ossified, no bursa, testes medium, stomach-content tiny insects; ♂ (ANSP 183436; NK6-12.9.90) 9.2 g, skull ossified, testes medium, stomach-content insects; ♂ (ANSP 183437; NK10-21.9.90) 8.9 g, skull 70% ossified, no bursa, testes medium, stomach-content insects.

BAR-WINGED WOOD-WREN *Henicorhina leucoptera*

This recently described species was only known from northern Peru on both sides of Río Marañón (Fitzpatrick *et al.* 1977, Davis 1986). It was fairly common at our camp, and was also seen higher up, near

Chinapinza at 1900 m. The length of its known range was thus extended from 400 to 500 km. The Grey-breasted Wood-wren *Henicorhina leucophrys* reached its highest elevation at our camp, and the two species were captured in the same nets at 1700 m. *H. leucoptera* has been recorded on a low-lying ridge (1350–1450 m) in San Martín (Davis 1986), elsewhere occurring at 1700–2450 m (Fitzpatrick *et al.* 1977, Davis 1986). Although apparently co-occurring with *leucophrys* at all its known localities, *leucoptera* generally seems to replace that species at higher elevations. Among the 11 specimens of *leucoptera* collected were two in true juvenal plumage. The only description of a young bird (Fitzpatrick *et al.* 1977) seems to be based on a specimen partly in its first basic plumage. Our birds differ from that description by having only a faint supercilium, by being dark on the cheeks, by having the entire underside dark, feathers of throat, breast and belly dark grey with dark umber-brown tips that increase in extent posteriorly, sides of breast, sides, and flanks dark umber-brown, belly and under tail-coverts dark cinnamon. There is no wing-bar, but the edges near the tips of the outer webs of the two alula feathers are white, a character not found in juvenile *leucophrys*. The basal two-thirds of the mandible are yellow.

Specimen data: ♀ (MECN; NK5-11.9.90) 14.0 g, skull ossified, ovary granular; ♀ (ZMUC; NK16-19.9.90) 14.9 g, skull ossified, no bursa, ovary granular, oviduct straight; ♀ (ANSP 183482; NK9-12.9.90) 16.8 g, skull ossified, ovary granular; ♂ (MECN; NK4-17.9.90) 14.4 g, skull 90% ossified, bursa 1 × 2 mm, testes medium to small; ♂ (ZMUC; NK3-13.9.90) 16 g, skull ossified, testes medium to small; ♂ (ANSP 183484; MK5-17.9.90) 16 g, skull ossified, testes medium; ♂ (ANSP 183481; NK3-11.9.90) 14.5 g, skull ossified, testes small; juvenile ♂ (MECN; NK12-11.9.90) 14.8 g, skull unossified, bursa 1 × 4 mm, testes small; juvenile ♂ (ANSP 183482) 13.1 g, skull 50% ossified, bursa 3 × 2 mm, testes small. Skeleton (ZMUC; NK11-17.9.90).

METALLIC-GREEN TANAGER *Tangara labradorides chaupensis*

Several pairs were seen near our camp at 1700 m. One taken on 17 September represents the first specimen of this race from Ecuador. There are previous sightings from Morona-Santiago in southeast Ecuador (Ridgely 1980), otherwise the taxon is known only from both sides of Río Marañón in northern Peru.

Specimen data: unsexed (MECN; NK16-17.9.90).

Discussion

Robbins *et al.* (1987) listed 24 species recorded between 1900 and 2400 m in the Cordillera de Cutucú and not at similar elevations in the Cordillera del Condor, and believed 10 of these to be genuinely absent. On the present expedition 11 or 12 of the 24, including 3 thought to be absent, were found by us near Chinapinza in the Cordillera del Condor. It seems possible that an investigation of a number of localities in these mountains would reveal the presence of most or all of the remaining 12.

Although no species is endemic to the Cordillera del Condor, several upper tropical and subtropical zone forms with restricted ranges are found here. All but one, *Pyrrhura albipectus*, also occur south of Río Marañón in northern Peru. The Royal Sunangel *Heliangelus regalis* was not found in our study area. It is known from Peru at the type-locality above San José de Lourdes, Department of Cajamarca, at 1800–2200 m and from the Department of San Martín at 1450 m, where it has been found in stunted forest and along forest-edge (Fitzpatrick *et al.* 1979, Davis 1986). It undoubtedly occurs on some of the higher ridges in the Ecuadorean part of Cordillera del Condor. The Orange-throated Tanager *Wetmorethraupis sterrhopteron* is only known from epiphyte-laden trees in tall humid forest at 600–1000 m on the lower slopes of Cordillera del Condor and on the immediately adjacent slope south of Río Marañón (Lowery & O'Neill 1964, O'Neill 1969, Isler & Isler 1987). The Cinnamon-breasted Tody-tyrant was considered a part of a relict species-group by its describers (Fitzpatrick & O'Neill 1979), and a close relative of the Royal Sunangel is presently being described on the basis of old Colombian specimens (G. Graves in press). However, the White-breasted Parakeet seems to have no very close allies, there being distinctive differences in vocalisations (as well as plumage) between that and the Maroon-tailed Parakeet *Pyrrhura melanura berlepschi* (NK tape-recordings). The Orange-throated Tanager is so distinct that it was placed in a monotypic genus by its describers.

In view of the many species and subspecies having distributions ending at the Río Marañón, it is interesting to note that most of the endemic birds occur on both sides of the river. This suggests the presence of unique or rare habitats in the region. Whether any of the birds actually evolved *in situ*, remains open to speculation, but as their very restricted ranges now encompass the Cordillera del Condor, it is evident that these mountains deserve special consideration from conservationists.

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APPENDIX

Species recorded at the camp between La Punta and Chinapinza in Cordillera del Condor at 1650–1700 m. Abundance: C=common, recorded daily in moderate to large numbers (>10 individuals); FC=fairly common, recorded daily in small numbers (<10 individuals); U=uncommon, recorded on one out of three days, occurs in small numbers; R=rare, recorded on one of six days or less often, occurs in small numbers. Species tape-recorded but not collected are marked with a t. Species only sighted are marked with an *.

Elanoides forficatus FC*, *Ictinia plumbea* FC*, *Buteo magnirostris* FC, *Micrastur ruficollis* FCt, *Chamaepetes goudotii* once at 1400 m, *Columba subvinacea* FCt, *Geotrygon frenata* R*, *Pyrrhura albipectus* FC, *Pionus sordidus* Ut, *Amazona mercenaria* FCt, *Piaya cayana* FC, *Otus petersoni* FC, *Streptoprocne zonaris* U*, *Cypseloides rutilus* FC*, *Chaetura cinereiventris* R, *Chaetura brachyura* R*, *Doryfera ludoviciae* FC, *Phaethornis guy* U, *Phaethornis syrmatophorus* U, *Eutoxeres aquila* U, *Adelomyia melanogenys* C, *Urosticte benjamini* R, *Colibri coruscans* R, *Colibri thalassinus* R, *Heliodoxa leadbeateri* FC, *Coeligena coeligena* FC, *Boissonneaua matthewsii* FC, *Haplophaedia aureliae* U, *Ocreatus underwoodii* FC, *Aglaiocercus kingi* FC, *Pharomachrus antisianus* Rt, *Trogon personatus* FC, *Malacoptila fulvogularis* U, *Eubucco bourcierii* R, *Aulacorhynchus prasinus* Ut, *Piculus rubiginosus* Rt, *Veniliornis fumigatus* FC, *Sittasomus griseicapillus* Rt, *Xiphocolaptes promeropirhynchus* R, *Xiphorhynchus triangularis* FC, *Synallaxis unirufa* Ut, *Premnoplex brunnescens* FC, *Pseudocolaptes biossonneauti* FC, *Hyloctistes subulatus* R, *Syndactyla subalaris* FC, *Syndactyla rufosuperciliata* U, *Anabacerthia striaticollis* FC, *Philydor erythrocercus* R, *Thripadectes* sp. R*. *Xenops rutilans* R, *Thamnophilus unicolor* FC, *Dysithamnus mentalis* FC, *Myrmotherula schisticolor* FC, *Drymophila caudata* FC, *Formicarius rufipectus* FCt, *Grallaria haplonota* FCt, *Grallaria hypoleuca* Uh, *Scytalopus femoralis* FC, *Zimmerius viridiflavus* C, *Mionectes striaticollis* FC, *Mionectes olivaceus* U, *Phylloscartes* sp. cf. *superciliaris* R*, *Pogonotriccus* sp. cf. *gualaquizae* R*, *Pseudotriccus pelzelni* FC, *Lophotriccus pileatus* C, *Hemitriccus cinnamomeipectus* U, *Platyrinchus mystaceus* R, *Myiotriccus ornatus* FC, *Myiophobus flavicans* FC, *Pyrrhomyias cinnamomea* FC, *Contopus borealis* R*, *Myiarchus cephalotes* FC, *Myiodynastes chrysocephalus* R*, *Tyrannus melancholicus* R*, *Pipreola riefferii* FC, *Pipreola lubomirskii* FC, *Pipreola frontalis* FC, *Schiffornis turdinus* FCt, *Chloropipo unicolor* U, *Chloropipo holochlora* R*, *Masius chrysopterus* FC, *Notiochelidon cyanoleuca* Ct, *Cyanocorax yncas* R, *Cinnycerthia peruana* FC, *Troglodytes solstitialis* FC*, *Henicorhina leucophrys* FC, *Henicorhina leucoptera* C, *Myadestes ralloides* FC, *Turdus fulviventris* FC, *Cyclarhis gujanensis* FC, *Myioborus miniatus* C, *Basileuterus tristriatus* FC, *Coereba flaveola* FC, *Chlorochrysa calliparaea* FC, *Tangara labradorides* FC, *Tangara arthus* FC, *Tangara xanthocephala* FC, *Tangara parzudakii* FC, *Tangara cyanicollis* FC, *Tangara nigroviridis* FC, *Iridosornis analis* C, *Euphonia xanthogaster* C, *Anisognathus flavinucha* C, *Calochaetes coccineus* FC, *Piranga leucoptera* R*, *Creurgops verticalis* U, *Chlorospingus ophthalmicus* FCt, *Chlorospingus canigularis* FC, *Pitylus grossus* FC, *Pheucticus chrysopeplus* R, *Diglossa glauca* C, *Carduelis olivacea* R*, *Oryzoborus angolensis* R, *Atlapetes brunneinucha* FC.

IN BRIEF

NOTES ON THE BUFF-FRONTED OWL *AEGOLIUS HARRISII* IN BRAZIL

The Buff-fronted Owl *Aegolius harrisii* (Cassin, 1849) is one of the rarest Brazilian night-birds, being spottily recorded from Ceará, Pernambuco and Bahia south to Goiás, São Paulo, Santa Catarina and Rio Grande do Sul (Sick 1985). Only 200–212 mm in total length and weighing 104–135 g (adult males), this small owl occurs from the coastal lowlands (50 m) to the high mesetas (1000 m) of the hinterland, inhabiting the *caatingas* and the semideciduous forests of the northeast, the *cerrado* and *cerradão* of central Brazil (Negret *et al.* 1984), some man-made landscapes, and even urban areas as in Curitiba, Paraná. Virtually nothing is known about the biology of the Buff-fronted Owl (Burton 1973, Clark *et al.* 1978, Hume 1991, Storer 1989), which is also scarcely represented in ornithological collections.

We have found that this owl is an uncommon resident in the man-made landscapes rich in palms and fruit trees in the lowlands (50 m) of Vargem da Meira, near Camaçari, coastal Bahia (*c.* 10°30′S, 35°40′W), where we discovered an adult incubating in the hollow trunk of an unidentified dead palm on 2 March 1985. The cavity may have been an abandoned nest hole of a parrot such as the Peach-fronted Parakeet *Aratinga aurea* or the Sun Parakeet *A. solstitialis*, which are very common in the region; and measured 60 cm deep and 15 cm in diameter, with access through a small hole 10 cm in diameter, 6 m above the ground. The base of the cavity was covered with dry cattle dung, a green feather of a parakeet, unidentified hairs, and the remains of some prey, such as the chitin of insects and bones of a small rodent. The clutch consisted of 3 ovoid white eggs, which measured 33.0×27.6, 33.0×28.0 and 33.4×27.0 mm (average 33.13×27.53 mm), and weighed 12.5, 12.5 and 11.8 g respectively (average 12.27 g).

So far as we know, the vocalizations of this species include a quavering sequence of monotonous *ku-ku-ku . . .* notes, slightly crescendo, 4–20 seconds long, and a single, hooting *oouuu* (see also Sick 1985, Hume 1991).

In March 1990, we also found *A. harrisii* at Inhuporanga (300 m), Ceará (*c.* 4°06′S, 39°03′W), where it occurred in pasturelands interspersed among the very dry and sometimes secondary *caatinga*, probably nesting in holes of carnauba palms (*Copernicia cerifera*).

We would like to thank Conservation International, and the Brazilian Conselho Nacional de Desenvolvimento Cientifico e Tecnológico (CNPq), which partially supported our studies on northeastern Brazilian birds.

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FIRST RECORD OF CHIRPING CISTICOLA CISTICOLA PIPIENS FROM BURUNDI

On 29 September 1992 we found three pairs of Chirping Cisticolas *Cisticola pipiens* in a marshy area about 200 m south of the golf course in Bujumbura, Burundi. This species, only recently added to the East African list (Moyer & Sikombe 1992, *Scopus* 16: 55–56), was recognized by its distinctive song (Fig. 1). The birds were in a mosaic of reeds, cat-tails, rank grass, and maize and sweet-potato cultivation. They were relatively tame, singing from exposed positions on reeds and grass, and allowing approach to within 15 m. Excellent views were obtained through 10 × binoculars. Further visits were made to this site on 1 and 3 October; the song was recorded, and one individual was mist-netted and photographed. Two other cisticola species heard at this site were Red-faced Cisticola *C. erythrops* and Winding Cisticola *C. galactotes*. The Chirping Cisticolas had buffy brown backs broadly streaked with

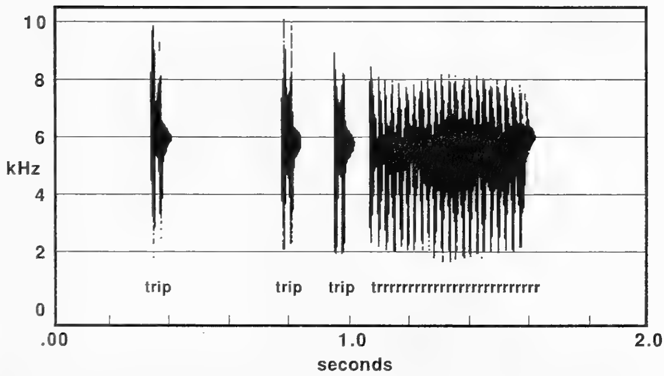

Figure 1. Sonagram of the song of Chirping Cisticola *Cisticola pipiens* recorded in Bujumbura, Burundi.

black, thereby distinguishing them from the plain-backed Red-faced Cisticolas and from Winding Cisticola, which has a greyish back with black streaks. Other characters noted which distinguish Chirping Cisticola from Winding Cisticola in the field were the darker lores, larger size, and longer and 'floppier' tail of Chirping Cisticola. The netted individual had a wing of 71 mm (almost certainly a male). All three species are most easily identified in the field by their songs.

Chirping Cisticolas were observed at two nearby sites within Bujumbura. DCM noted a pair of Chirping Cisticolas singing in rank grass on the shore of Lake Tanganyika at the Bujumbura yacht club on 3 October. TSS and Nedra Klein found several pairs in reeds and tall grass at a marshy area on the northern edge of the golf course in Bujumbura on 1 and 3 October. We also found Chirping Cisticolas in the Rusizi River Delta National Park west of Bujumbura. It was common in the extensive reed beds fringing the shore of Lake Tanganyika during visits by DCM on 2 October and by TSS on 3 and 6 October. TSS obtained additional tape-recordings of this species, which will be deposited at the Library of Natural Sounds, Cornell University Laboratory of Ornithology. Red-faced and Winding Cisticolas were also seen at Rusizi, and a small cloud-scraper, probably Wing-snapping Cisticola *C. ayresii* or Pectoral-patch Cisticola *C. brunnescens*, was seen on the short-grass plain fringing the reed beds.

These are the first records of Chirping Cisticola from Burundi and represent a northward range extension of about 800 km from the Ufipa Plateau in Tanzania (Moyer & Sikombe 1992, *loc. cit.*) and about 550 km from the nearest record in the Marungu Highlands on the Zaire side of the lake (Chapin 1953, *Bull. Am. Mus. Nat. Hist.* 75A; Dowsett & Prigogine 1974, *Cercle Hydrobiologique de Bruxelles* 19: 1–67). Considering that this species has been overlooked by birders within the city limits of Bujumbura and in the well known Rusizi Delta National Park, it probably occurs in appropriate habitat all around the shores of Lake Tanganyika and adjacent highland areas in Zaire and Tanzania.

We thank Bob and Laura Payne for making the recording of Chirping Cisticola from which the sonagram was produced. Liz and Neil Baker provided transport to the Rusizi Delta National Park and photographed the captured bird, and Jacob Kiure assisted with mist-netting. G. Maclean confirmed our identification of this species based on the song, and J. V. Remsen commented on the manuscript. These observations were made while we were attending the Eighth Pan-African Ornithological Congress; Schulenberg is grateful to the Ridgeway Bird and Wildlife Endowment, Department of Ecology and Evolution, University of Chicago, and the Field Museum of Natural History, for providing funding.

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18 January 1993

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Edited by
Dr D. W. SNOW

Volume 114 No. 2 June 1994

FORTHCOMING MEETINGS

Tuesday, 19 July 1994. Mr Richard ffrench, who has a wide knowledge of the Caribbean and is the author of *The Birds of Trinidad and Tobago,* will speak on **"Sounds of Birds in the Neotropics".**

Members wishing to attend are asked to notify the Hon. Secretary by Tuesday, 5 July 1994.*

Tuesday, 9 August 1994. An additional meeting to take advantage of the visit to Britain by **Professor Jacques Vielliard,** of the Universidade Estadual de Campinas, São Paulo. Professor Vielliard's talk is entitled **"Hummingbirds also Sing".**

Members wishing to attend are asked to notify the Hon. Secretary by Tuesday, 26 July 1994.*

Tuesday, 20 September 1994. We are delighted to welcome back **Dr Storrs Olson** who will speak on **"Seabirds of the North Atlantic through 20 Million Years".**

Members wishing to attend are asked to notify the Hon. Secretary by Tuesday, 6 September 1994.*

Tuesday, 4 October 1994. Mr Tom Gullick will introduce **Mr Rafael Heredia,** who will speak on **"Lammergeier in the Pyrenees—Past, Present and Future".** Since 1970 Rafael Heredia has been monitoring Lammergeier in the Pyrenees. This work began as a personal venture, subsequently backed by WWF, the Belgium Institute for the Protection of Raptors, and now funded by the Spanish Government Conservation Agency.

Members wishing to attend are asked to notify the Hon. Secretary by Tuesday, 20 September 1994.*

Tuesday, 9 November 1994.—*Please note change of date of this meeting*—The Reverend Tom Gladwin will speak on the **Appalachian Mountains.** (The talk previously advertised by Mr Turner has been postponed until next year.)

Tuesday, 6 December 1994. Mr Michael Walters, of the Natural History Museum, will speak on the **"History of Ornithology".**

Meetings are held in the Sherfield Building of Imperial College, South Kensington, London at 6.15 p.m. for 7 p.m. A map showing Imperial College will be sent to members on request.

Overseas Members visiting Britain are particularly welcome at meetings, details of which can be obtained from the Hon. Secretary, 1 Uppingham Road, Oakham, Rutland LE15 6JB. Telephone (0572) 722788.

*Late acceptances and cancellations can usually be taken up to the weekend preceding a meeting, although members are asked to accept by 14 days beforehand as arrangements for meetings have to be confirmed with Imperial College well in advance.

Bulletin of the BRITISH ORNITHOLOGISTS' CLUB

Vol. 114 No. 2 Published 27 June 1994

The eight hundred and thirty-fifth meeting of the Club was held on Tuesday, 7 December 1993 in the Ante-room of the Sherfield Building, Imperial College, South Kensington at 6.15 p.m. 29 Members and 12 Guests attended.

Members attending were: D. Griffin (*Chairman*), J. H. Fanshawe (*Speaker*), D. R. Calder, Cdr. M. B. Casement RN Retd, Professor R. J. Chandler, Dr R. A. Cheke, S. J. Farnsworth, G. D. Field, Revd T. W. Gladwin, A. Gibbs, C. A. R. Helm, K. Henshall, S. Howe, D. J. Montier, Mrs A. M. Moore, R. G. Morgan, Mrs M. Muller, P. J. Oliver, R. E. F. Peal, Dr C. Ryall, R. E. Scott, Dr R. Self, P. J. Sellar, R. E. Sharland, N. H. F. Stone, Dr D. H. Thomas, Professor W. E. Waters, C. E. Wheeler, M. W. Woodcock.

Guests attending were: L. Bennun, Mrs G. Bonham, J. N. B. Brown, Mrs F. M. Farnsworth, Miss E. Griffin, Mrs S. Griffin, Mrs. J. Gladwin, Miss K. Hoff, Mrs M. Montier, P. J. Moore, Mrs J. Waters, Mrs B. Woodcock.

Mr J. Fanshawe spoke after supper on "Conservation and Research in Arabuko-Sokoke Forest, Kenya."

Arabuko-Sokoke Forest lies just south-east of Malindi, a town 110 km north of Kenya's coastal capital, Mombasa. The forest covers about 370 km^2 and is the largest stand of near-continuous natural forest cover on the coast. Forming part of the Zanzibar-Inhambane zone, it is widely believed to have survived dry phases of the Pleistocene, a factor which must have contributed to the emergence of unique, restricted taxa, including the six Red Data birds which occur there: Sokoke Scops Owl *Otus ireneae*, Clarke's Weaver *Ploceus golandi*, Sokoke Pipit *Anthus sokokensis*, Aman Sunbird *Anthreptes pallidigaster*, East Coast Akalat *Sheppardia gunningi*, and Spotted Ground-thrush *Turdus fischeri*. It is not important only for birds, however; it provides building poles and fuelwood, medicinal plants, and a wide range of other produce, like honey, to the communities nearby.

Since 1989, BirdLife International (formerly ICBP) has run a research and conservation project in Arabuko-Sokoke funded by the EC. Undertaking management support, training and tourism development, the teams researched human use of Sokoke and its impact on animal populations, principally the effect of logging on birds, and of hunting on mammals.

Sokoke contains three vegetation zones, reflecting soil type and rainfall patterns. Each is dominated by a particular tree species, *Afzelia quanzensis, Brachystegia spiciformis* or *Cynometra webberi*, and it has been the use of such hardwoods that has altered forest structure. Only 28% is in primary condition. Using point counts, mist-netting, and observations of colour-ringed birds, data were collected on a full range of forest, edge and open country species; a total of 233 species have been recorded. It is clear that habitat type and condition strongly influence community structure. Specialists like Little Yellow Flycatcher *Erythrocercus holochlorus* decline in degraded areas, while generalists like Zanzibar Greenbul *Andropadus importunus* invade. A closer look at habitat choice reveals detailed preferences dictating whether or not birds will cope with secondary forest. Tiny Greenbuls *Phyllastrephus debilis* and Forest Batises *Batis mixta* need dense middle canopy cover, while ground-foraging Sokoke Pipits look for good litter cover, and Amani Sunbirds for near-closed high canopy. Teasing out structural likes and dislikes for a full range of forest-dependent birds is critical for conservation, allowing habitats to be managed much more appropriately.

At the heart of the future success of conservation in Sokoke lies the capacity to strike a balance between human activity and conservation in the forest, to achieve long term sustainable use. To that end the income brought by the increasing number of welcome tourists (which has included several BOC members) is making a steady contribution to development in the area. David Ngala, who acted as field assistant throughout the bird research, has remained in Sokoke as the main bird guide. He specialises in finding the elusive Sokoke Scops Owl for people. Another example of changing attitudes has been the realisation, following Dr Clare FitzGibbon's research on one of the threatened mammals, the Golden-rumped Elephant-shrew *Rhynchocyon chrysopygus*, that hunting and trapping can continue sustainably if measures are taken to avoid the killing of declining species. Some mammals, like the closely related Four-toed Elephant-shrew *Petrodomus tetradactylus*, are abundant despite fairly high trapping pressure. Instituting a management policy which includes constructive discussion with hunters, backed up with selective removal of traps set for endangered species like Ader's Duiker *Cephalophus adersi*, can ensure that a sustainable balance is achieved and maintained.

The eight hundred and thirty-sixth meeting of the Club was held on Tuesday, 18 January 1994 in the Senior Common Room of the Sherfield Building, Imperial College, South Kensington at 6.15 p.m. 24 Members and 11 Guests attended.

Members attending were: D. GRIFFIN (*Chairman*), J. A. BURTON (*Speaker*), Miss H. BAKER, P. J. BELMAN, P. J. BULL, Professor R. J. CHANDLER, Dr R. A. CHEKE, S. J. FARNSWORTH, A. GIBBS, Revd T. W. GLADWIN, Dr A. G. GOSLER, C. A. R. HELM, R. H. KETTLE, N. S. MALCOLM, Dr J. F. MONK, D. J. MONTIER, Mrs A. M. MOORE, R. G. MORGAN, Mrs. M. MULLER, P. J. OLIVER, R. E. F. PEAL, Dr R. C. SELF, P. J. SELLAR, N. H. F. STONE.

Guests attending were: Mrs F. FARNSWORTH, Mrs B. GIBBS, Mrs J. GLADWIN, Miss K. HOFF, Mrs D. MONK, Mrs M. MONTIER, P. J. MOORE, B. O'BRIEN, Mrs S. STONE, C. WALKER, Miss K. J. WILSON.

After supper Mr P. J. Bull presented a short communication on the recovery of a Common Starling *Sturnus vulgaris* from Kiev, in Ukraine.

Mr J. A. Burton was the principal speaker of the evening. He showed a programme of extracts from films of particular ornithological interest which he has compiled from the National Film Archive. It includes extracts from Oliver Pike's film, made in 1903, of landing on St Kilda, films made in Central Hungary and in East Africa before 1940, and Roger Tory Peterson's film of *Wild Europe*. It was possible to see from the extracts, which were of remarkable quality, the development of modern wildlife filming techniques.

Birds of the lower Kolyma River, northeast Siberia

by Eugene R. Potapov

Received 2 March 1993

This paper is based on observations made in four study areas on the lower Kolyma River in 1982–92: in the Chukochya river basin in 1982–83; in the Kolyma river delta (Nerpichye Lake and Pokhodskaya Yedoma study areas) in 1985; and in the Konkovaya river basin in 1986–92 (Fig. 1). Occasional visits were also made to the right bank of the Kolyma river. All study areas except the Nerpichye Lake area are located in the Kolyma lowlands in the typical tundra subzone. This zone is characterised by the absence of tall bushes on the watersheds. The territory is underlain by permafrost and, generally, the study areas resemble gently rolling plains with characteristic hillocks called *yedomas* separated by river valleys and perforated by numerous lake depressions indicating that the permafrost plays an important role in the formation of the topography, or at least the micro-relief.

The study areas in the Chukochya and Konkovaya rivers are very similar. The greater part of the territory consists of *yedomas* with numerous lake hollows. River valleys are relatively dry, but contain some polygonal bogs.

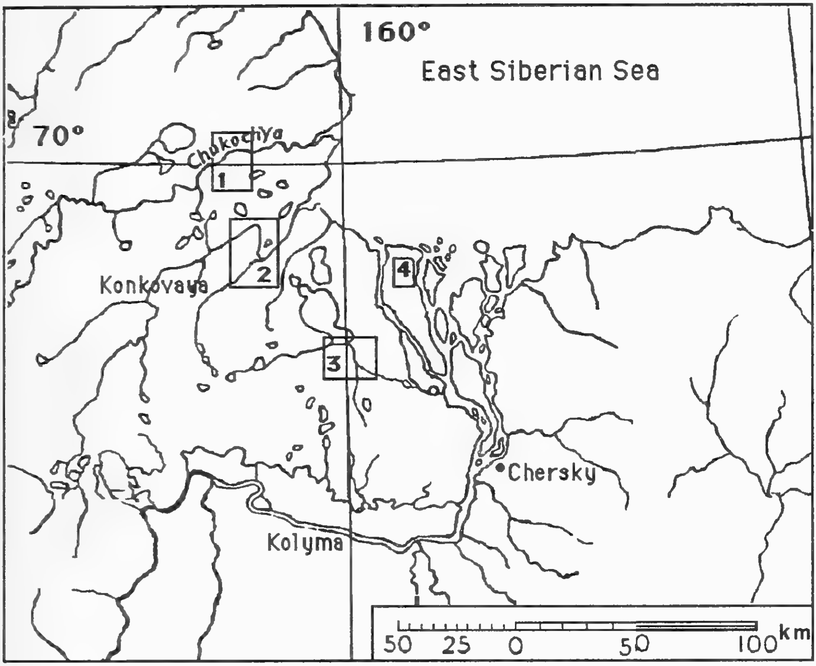

Figure 1. The four study areas in the lower Kolyma River area: 1, Chukochya River (1982–83); 2, Konkovaya River (1986–92); 3, Nerpichye Lake (1985); 4, Pokhodskaya Yedoma (1985).

The Nerpichye Lake study area is part of the Kolyma river flood-plain. Polygonal bogs dominate the landscape. There are no *yedomas* in the area; the most visible landmarks are *pingos* (small hillocks pushed up by freezing water below the soil), which are scattered in the tundra. The vegetation is dominated by bushes and moss. This study area is located in the bushy tundra subzone.

The Pokhodskaya Yedoma is a rocky cliff surrounded with bush-less tundra flood plain. The dry vegetation on the rock contrasts with the wet habitats in the plain.

Background

Studies of the fauna of the Kolyma River began in the 19th century when the area was visited by Matyushkin and Vrangel (Vrangel 1841) and later by Baron G. Maidel (1894) who made a zoological collection. In 1892 the Kolyma River was visited by I. Chersky (Revsin 1952), who also collected birds and mammals. The collection (kept at the Zoological Institute, St Petersburg) covered the taiga of the Kolyma River but includes few tundra specimens because of the untimely death of I. Chersky which brought the expedition to an end. In 1905 the

Kolyma lowlands were visited by S. A. Buturlin (Buturlin 1905, 1906a–b). While travelling around the Kolyma delta he visited the Nerpichye Lake and Pokhodskaya Yedoma where my study areas are located. He also collected birds and animals.

Later the region was visited by N. N. Gribanovsky (Gribanovsky 1915). In 1911–1912 the Kolyma lowlands were visited by Johan Koren on his own schooner. He made a significant collection of birds and mammals. The bird collection was studied by the sponsor of the expedition, J. E. Thayer (Thayer & Bangs 1914). The area of the Kolyma lowlands made such a deep impression on Koren that he returned and settled there in 1914–1918. In his journey to the lower Kolyma in 1914 he was accompanied by Mr. Copley Amory, Jr., who also made a bird collection which was eventually studied by J. Riley (1918). During his period of residence in 1914–18 in Nizhne-Kolymsk (near the recent Kolymskoye settlement) Koren made a substantial bird and mammal collection. The bird collection was rescued in winter 1917/18 by the crew of the vessel "Maud" led by R. Amundsen, and later investigated by Schaaning (Schaaning 1954). The Roald Amundsen expedition was trapped by ice near the Kolyma estuary several times in 1918–24. They also observed wildlife and left a small bird collection later studied by Schaaning and Sverdrup (Schaaning & Sverdrup 1928).

In the 1930s some data on the local birds were collected by A. I. Ivanov (Tugarinov *et al.* 1934). In 1957 K. Vorob'ov visited the Pokhodsk, Nerpichye Lake and Konkovaya and Chukochya rivers. His data are summarised in his book *Birds of Yakutia* (Vorob'ov 1963). Spangenberg spent the spring of 1959 in the Kolyma delta not far from the Pokhodskaya study area, and published a list of the birds recorded (Spangenberg 1960).

Since 1978 the research team led by Dr A. V. Andreev from the Magadan Institute of Biological Problems of the North has carried out research on bird ecology in this region. Kondrat'ev (1979), Andreev & Dorogoy (1987), Gavrilov & Potapov (1991), Chernov & Khlebosolov (1989) and Khlebosolov (1986) published various papers containing faunal records. I joined the team in 1982. Some of my reports were included in the book on the avifauna of northeast Siberia (Kretchmar *et al.* 1991), which summarises all observations to that date. In 1990 M. Densley visited the Konkovaya study area, where he studied a colony of Ross's Gulls (Densley 1991).

SYSTEMATIC LIST

Of the 91 species recorded in the region, only Willow Grouse, Snowy Owl and Gyrfalcon live on the tundra all year round. All the others are migratory. They arrive on the tundra at the end of May and leave in August–September. In July–August there is a migration of geese and waders to the north. These birds spend several weeks on the mud-flats of the Arctic Ocean, before starting their journey to the south.

The following species are common breeders in all four study areas: Red-throated Diver *Gavia stellata*, Black-throated Diver *G. arctica*, Bewick's Swan *Cygnus bewickii* (also flocks of non-breeding birds in Pokhodskaya study area), Teal *Anas crecca*, Pintail *A. acuta* (moulting flocks of Teal and Pintail in Konkovaya study area), King Eider *Somateria spectabilis*, Scaup *Aythya marila*, Long-tailed Duck *Clangula hyemalis*, Red-breasted Merganser *Mergus serrator*, Rough-legged Buzzard *Buteo lagopus* (except Nerpichye Lake area), Willow Grouse *Lagopus lagopus*, Sandhill Crane *Grus canadensis*, Grey Plover *Squatarola squatarola*, Lesser Golden Plover *Pluvialis dominica*, Spotted Redshank *Tringa erythropus*, Grey Phalarope *Phalaropus fulicarius*, Red-necked Phalarope *P. lobatus*, Ruff *Philomachus pugnax*, Temminck's Stint *Calidris temminckii*, Pectoral Sandpiper *C. melanotos*, Snipe *Gallinago gallinago*, Long-billed Dowitcher *Limnodromus scolopaceus*, Arctic Skua *Stercorarius parasiticus*, Long-tailed Skua *S. longicaudus*, Herring Gull *Larus argentatus*, Glaucous Gull *L. hyperboreus*, Ross's Gull *Rhodostethia rosea*, Arctic Tern *Sterna paradisaea*, Red-throated Pipit *Anthus cervinus*, Yellow Wagtail *Motacilla flava*, White Wagtail *M. alba*, Willow Warbler *Phylloscopus trochilus*, Wheatear *Oenanthe oenanthe* (except Nerpichye Lake area), Bluethroat *Luscinia svecica*, Common Redpoll *Carduelis flammea*, Little Bunting *Emberiza pusilla*, Lapland Bunting *Calcarius lapponicus*.

White-billed Diver *Gavia adamsii*. Breeds on big 'alas'-type lakes (thaw-lakes).

Pacific Diver *G. pacifica*. Common in Nerpichye Lake study area, not very common in the Konkovaya and Chukochya study areas.

Red-necked Grebe *Podiceps grisegena*. Seen every year in all study areas except the Chukochya study area. Rare breeder in the Nerpichye Lake study area.

Whooper Swan *C. cygnus*. Recorded breeding only in Konkovaya study area. Occasional visits of non-breeding birds to all study areas. Moulting birds seen in the Nerpichye Lake study area.

Brent Goose *Branta bernicla*. Recorded on migration in all study areas. Nesting colonies are found along the Arctic Ocean coastline.

White-fronted Goose *Anser albifrons*. Breeds in all study areas, but is not very common. Vorob'ov (1963) reported the species more abundant in the region than the Bean Goose. Now the situation is reversed. This is the result of a dramatic decline in the numbers of White-fronted Goose.

Lesser White-fronted Goose *A. erythropus*. Recorded on migration in all study areas. No breeding records. Relatively rare.

Bean Goose *A. fabalis*. Relatively common breeder. Nests are found on clay precipices along rivers, and in polygon habitat in river valleys.

Snow Goose *Chen caerulescens*. Some flocks were seen in Chukochya and Konkovaya valleys on spring migration. Nearest breeding record in Chukochya mouth (Andreev & Dorogoy 1987), also seen in the Kolyma river delta by Spangenberg (1960).

Baikal Teal *Anas formosa*. Breeding recorded in the Konkovaya study area. Seen in Nerpichye Lake and Chukochya study areas.

Wigeon *A. penelope*. Recorded on summer migration in all study areas. No breeding records.

Shoveler *A. clypeata*. Summer records in the Kolyma and Konkovaya study area. Recorded breeding in 1970 in the Upper Konkovaya river by Andreev (Kretchmar *et al.* 1991).

Spectacled Eider *Somateria fischeri*. Breeding records from Chukochya and Konkovaya study areas. Seen on migration in all study areas.

Steller's Eider *Polysticta stelleri*. Seen on migration in all study areas, no breeding records within the study areas. One nest was found by Andreev (Kretchmar *et al.* 1991) in 1978 in flat dried tundra east from the Konkovaya River.

American White-winged Scoter *Melanitta deglandi*. Summer visitor to the Nerpichye Lake study area. No breeding records.

Osprey *Pandion haliaetus*. One breeding record in the Kolyma delta. The nest was located 20 km north from the Pokhodsk settlement. It was on a bush about 1.5 m high and contained 2 chicks (S. Mochalov pers. comm.)

White-tailed Eagle *Haliaeetus albicilla*. Young birds and adults seen in Nerpichye Lake and Konkovaya study areas. Nearest non-active nests built on the heaps of washed-out trees were found on the Arctic Ocean coastline.

Hen Harrier *Circus cyaneus*. Breeding recorded only in the Konkovaya study area.

Goshawk *Accipiter gentilis*. Seen in all study areas, no breeding records. Nearest breeding sites are in woodlands on the east bank on the Kolyma river. The white phase is frequent.

Gyrfalcon *Falco rusticolus*. Seen in all study areas. No breeding records. Nearest nests are located along the tree-line. Breeding records in the Pokhodskaya Yedoma study area and also on the east bank of the Kolyma river.

Peregrine Falcon *Falco peregrinus*. Breeds in all study areas except Nerpichye Lake area. Rare.

Kestrel *F. tinnunculus*. Seen in all study areas. No breeding records.

Merlin *F. columbarius*. Seen in all areas. No breeding records.

Ptarmigan *L. mutus*. Breeding records in the mountains east of the Kolyma river. Occasional winter visits to the west bank of the Kolyma river.

Siberian White Crane *Grus leucogeranus*. Rare. Seen in all study areas. Breeding in the Konkovaya study area.

Turnstone *Arenaria interpres*. Seen in all study areas on migration. No breeding records.

Dotterel *Charadrius morinellus*. Seen in all study areas. No breeding records.

Ringed Plover *Charadrius hiaticula*. Found nesting only in tundra adjoining the sea-coast (Kretchmar *et al.* 1991). Migrating birds may be seen in the Konkovaya study area in July-August.

Wood Sandpiper *Tringa glareola*. Occasional visits to the Konkovaya study area.

Terek Sandpiper *Xenus cinereus*. Seen in the Konkovaya study area. No breeding records.

Little Stint *Calidris minutus*. Found by I. Dorogoy in 1983–1984 in the Lower Chukochya River (Kretchmar *et al*. 1991).

Red-necked Stint *C. ruficollis*. Found nesting in 1982 in the Chukochya study area. No breeding records since that time.

Curlew Sandpiper *C. ferruginea*. Rare breeder in Konkovaya and Chukochya study areas.

Dunlin *C. alpina*. Seen in all study areas. No breeding records.

Sharp-tailed Sandpiper *C. acuminata*. Breeds in Konkovaya and Chukochya and Nerpichye Lake study areas, on wet polygons in lake hollows or river valley.

Sanderling *C. alba*. Seen in the Konkovaya study area in 1979 by Andreev (Kretchmar *et al*. 1991). Never seen since this time.

Pintail Snipe *Gallinago stenura*. Common breeder in Konkovaya and Nerpichye Lake study areas.

Jack Snipe *Lymnocryptes minimus*. Seen in all study areas. No breeding records.

Broad-billed Sandpiper *Limicola falcinellus*. Rare breeding records in Konkovaya study area.

Bar-tailed Godwit *Limosa lapponica*. Breeds in Konkovaya and Chukochya study areas.

Pomarine Skua *Stercorarius pomarinus*. Breeding records only in Konkovaya study area in 1987. Seen in all study areas.

Black-headed Gull *Larus ridibundus*. Seen in the Konkovaya study area as a summer vagrant. No breeding records.

Sabine's Gull *Xema sabini*. Seen in all study areas. No breeding records.

Cuckoo *Cuculus canorus*. Seen once in the Konkovaya study area.

Snowy Owl *Nyctea scandiaca*. Seen in all study areas. Breeding records in the Konkovaya and Chukochya study areas.

Short-eared Owl *Asio flammeus*. Breeds in all study areas, but not every year.

Sand Martin *Riparia riparia*. Seen in all study areas. Breeding records in the Konkovaya and Chukochya study areas.

Swallow *Hirundo rustica*. Seen in all study areas. No breeding records.

Great Grey Shrike *Lanius excubitor*. Seen in all study areas except Chukochya and the Pokhodskaya Yedoma study areas. No breeding records.

Siberian Jay *Perisoreus infaustus*. Once recovered from Peregrine pellets in the Pokhodskaya Yedoma study area.

Carrion Crow *Corvus corone*. Recorded in all study areas as an occasional visitor. No breeding records.

Siberian Accentor *Prunella montanella*. Breeding records in the Konkovaya study area.

Naumann's Thrush *Turdus naumanni*. Common breeder in the Konkovaya study area.

Redwing *T. iliacus*. A single male was seen in 1984 in the Nerpichye Lake study area (Kretchmar *et al*. 1991).

Stonechat *Saxicola torquata*. Breeding records in the Konkovaya study area (Gavrilov & Potapov 1991).

Brambling *Fringilla montifringilla*. Recorded once in the Konkovaya study area (Gavrilov & Potapov 1991).

Common Rosefinch *Carpodacus erythrinus*. Breeding record in the Nerpichye Lake study area.

Pine Grosbeak *Pinicola enucleator*. One record of a vagrant in the Konkovaya study area.

Pallas's Reed Bunting *Emberiza pallasi*. Breeds in the Konkovaya study area.

Snow Bunting *Plectrophenax nivalis*. Seen on migration in all study areas. Recorded breeding in the Pokhodskaya Yedoma study area.

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New departmental records and notes for some Bolivian birds

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Delimitation of bird distributions in Bolivia is important because the country is situated at the transition between several biogeographic regions: Amazonia, Gran Chaco, Cerrado and the Andes. Many Amazonian bird species reach the southern extension of their range in Bolivia; likewise, there are numerous species that reach their northern, western or eastern range limit in Bolivia. Remsen & Traylor (1989) presented departmental records for 1274 species and additional distributional data (with 37 new records for the country) have been contributed by Hanagarth & Sarmiento (1988), Bates *et al.* (1992), Cabot (1990), Parker (1989), Parker *et al.* (1991), Parker & Bailey (1991) and Davis & Flores (1994).

Here we present new departmental records for 52 species. A revision of the birds in the Colección Boliviana de Fauna (CBF), La Paz, Bolivia, produced 26 departmental records including the first documented record for some species listed in Remsen & Traylor (1989) as sight records. Recent fieldwork by ORO produced 10 additional departmental records based on voice recordings and one photograph; the recordings were analysed by T. A. Parker, III and are housed at the CBF. Also included are sight records (*) for 19 species easily identified in the field; many of these species are wide-ranging water-birds. Sight records by ORO and JS on the Ríos Madre de Dios and Manuripi, Dpto. Pando, were made while navigating in a motorized launch. In addition to the new departmental records, we include 'first specimen' data for 11 species previously documented by voice recordings. Among the records reported are the first specimens for Bolivia of *Notiochelidon flavipes* and *Turdus lawrencii*. We also present data for some species known in the country from only a few localities (*Lurocalis semitorquatus, Nyctiprogne leucopyga, Caprimulgus sericocaudatus, Cymbilaimus lineatus, Frederickena unduligera, Herpsilochmus longirostris, Myrmeciza* *fortis, Formicarius colma, Cyanocorax violaceus*). We follow the nomenclature and taxonomy used by Remsen & Traylor (1989).

Departamentos are abbreviated: Beni (BE), Chuquisaca (CH), Cochabamba (CO), La Paz (LP), Oruro (OR), Pando (PA), Potosi (PO), Santa Cruz (SC) and Tarija (TA). Localities frequently mentioned include: (1) Serranía de Eva Eva (15°29′S, 66°28′W), 230 m, Prov. Ballivián (BE), (2) Espíritu, Estancia Elsner Yacuma (14°08′S, 66°24′W), 170 m, Prov. Yacuma (BE), (3) Aserradero San Francisco (13°33′S, 68°00′W), 250 m, Prov. Iturralde (LP) and (4) Río Madre de Dios, between Riberalta (11°00′S, 66°06′W), 139 m and Puerto Chive (12°22′S, 68°36′W), 180 m, borders Prov. Madre de Dios, and Prov. Manuripi (PA). The authors are abbreviated SED, ORO, JS and WH.

Species accounts

GREY TINAMOU *Tinamus tao*

BE: Serranía Eva Eva, 22 October 1990, collected by ORO (CBF 2179). This represents the first specimen for BE. Parker (1989) reported the first records for BE based on voice recordings. The species previously has been recorded from lowland habitats in CO, LP, PA and SC (Remsen & Traylor 1989).

NEOTROPIC (OLIVACEOUS) CORMORANT *Phalacrocorax brasilianus**

PA: Río Madre de Dios, 27 September to 2 October 1991, fairly common, sight record by ORO. Previous records include neighbouring BE and LP, as well as CO, SC, OR and PO (Remsen & Traylor 1989).

ANHINGA *Anhinga anhinga**

PA: Río Madre de Dios, 27 September to 2 October 1991, fairly common, sight record by ORO. The species previously has been recorded from lowland habitats in BE, CO, LP and SC (Remsen & Traylor 1989).

GREAT EGRET *Casmerodius albus**

PA: Río Madre de Dios, 27 September to 2 October 1991, common, sight record by ORO. Previous records are from lowland habitats of neighbouring BE and LP, as well as CH, CO, SC and TA (Remsen & Traylor 1989).

CATTLE EGRET *Bubulcus ibis*

***PA**: Prov. Manuripi, Río Manuripi, San Silvestre (11°50′S, 68°40′W), 2 October 1991, JS saw groups of up to 10 individuals, some in breeding plumage, in disturbed grassy areas with cattle. Other individuals were seen by ORO in similar habitat at Arroyo Tulupa, 8 km SW of Santa Rosa (12°13′S, 68°24′W), Río Madre de Dios, 180 m, 8 October 1991. These represent the first records for PA. Previous records are from lowland habitats in BE, CH, CO, LP, SC and TA (Remsen & Traylor 1989).

BE: Espíritu, 8 February 1986, WH collected an individual "sobre nido" (CBF 0993); apparently immature, the bird was not in breeding plumage and had blackish legs (gonadal data are lacking). The breeding colony at Espíritu, in a *tajibillo* (*Tabebuia insignis*, Bignoniaceae) swamp, numbers as many as several thousand pairs in some years; breeding is from October to March (WH pers. obs.). This represents the first specimen for BE although numerous sight records exist (e.g. Pearson 1975, Flores 1988, Parker 1989, Rocha 1990a).

SNOWY EGRET *Egretta thula**

PA: Río Madre de Dios, 27 September to 2 October 1991, common, sight record by ORO. Previous records are from lowland habitats in BE, CO, LP and SC (Remsen & Traylor 1989).

OR: Prov. Cercado, Lago Uru Uru, 6 km by road SW of Oruro (17°59′S, 67°10′W), 3700 m, 13 November 1991, one individual seen by JS and S. Barrera. This is apparently the second record of the species from the puna zone of Bolivia; Rocha (1990b) reported a sight record for Prov. Sud Lipez, PO. The species also has been seen in the Lake Titicaca area of Peru (J. Fjeldså pers. comm.).

LITTLE BLUE HERON *Egretta caerulea**

LP: Provs. Franz Tamayo and Iturralde, lower Río Tuichi, 300 m. SED saw two lone individuals in adult plumage at the river's edge, 6 October 1992. This is apparently the third locality for the country. Hanagarth & Sarmiento (1988) reported the first record for Bolivia from Espíritu, BE (where it was recorded throughout the year), and R. O. S. Clarke (pers. comm.) has seen this species in Parque Nacional Amboró, SC. The species, which breeds in northern South America, also has been recorded in Paraguay, Uruguay and Argentina (see Hayes *et al.* 1990). Breeding has not been confirmed in Bolivia although Hanagarth & Sarmiento (1988) reported six individuals in a mixed colony of breeding herons and storks.

BLACK-CROWNED NIGHT-HERON *Nycticorax nycticorax**

PA:Prov. Manuripi, Río Manuripi (11°15′S, 67°45′W), 167 m, 13 October 1991, JS saw one adult individual. This apparently is the first record of the species in Amazonian lowland habitat; previous records are for BE, CO, LP, OR, SC and TA from non-Amazonian or puna habitats (Remsen & Traylor 1989).

ROSEATE SPOONBILL *Platalea ajaja**

PA: Río Madre de Dios, 21 September 1991, ORO saw a group of three individuals on a beach and a fourth lone individual in flight. Previous records are from non-Amazonian lowland habitats in BE, LP, SC and TA (Remsen & Traylor 1989).

MAGUARI STORK *Ciconia maguari**

LP: Prov. Iturralde, Ixiamas savannas, 45 km N of Ixiamas (13°35′S, 68°05′W), 200 m, 24 August 1991, one individual observed foraging in a savanna stream by JS. Previous records are from non-Amazonian lowland habitats in BE, CO, SC and TA (Remsen & Traylor, 1989).

BLACK VULTURE *Coragyps atratus*

BE: Espíritu, 26 April 1987, collected by WH (CBF 1156). This is the first specimen for BE although sight records are common. The species also has been recorded from lowland habitats in CO, LP, PA, SC and TA (Remsen & Traylor 1989).

SOUTHERN SCREAMER *Chauna torquata**

PA: Prov. Manuripi, Río Manuripi (11°15′S, 67°45′W), 167 m. JS saw two individuals fly over the river on 13 October and an individual was heard on the morning of 14 October 1991. Previous records are from non-Amazonian lowland habitats in BE, CH, CO, SC and TA (Remsen & Traylor 1989).

ORINOCO GOOSE *Neochen jubata**

PA: Río Madre de Dios, 27 September to 1 October 1991, uncommon, alone or in pairs, seen by ORO. The species also has been recorded from lowland habitats in BE, CO, LP, SC and TA (Remsen & Traylor 1989).

HARPY EAGLE *Harpia harpyja*

LP: Aserradero San Francisco, 14 August 1990, collected by JS (CBF 2063). Previously reported from lowland habitats in CO and SC (Remsen & Traylor 1989), this record and the following represent a considerable western extension of the species' range in Bolivia.

***PA**: Prov. Manuripi, Río Madre de Dios, Puerto Nuevo Esperanza (11°52′S, 67°58′W), 186 m, 1 October 1991, JS saw an adult individual in flight over the river at 0645 hr.

BLACK CARACARA *Daptrius ater**

PA: Río Madre de Dios, 28 September 1991, ORO saw two individuals foraging on the beach and one in a tree at the river's edge; 13 October 1991, one individual in forest along the river. Previous records are from Amazonian lowland habitats in BE, CO, LP and SC (Remsen & Traylor 1989).

LINED FOREST-FALCON *Micrastur gilvicollis*

BE: Serranía Eva Eva, 23 October 1990 (CBF recording). This is the first record for BE; the species previously has been recorded from Amazonian lowland habitats in CO, LP, PA and SC (Remsen & Traylor 1989).

BAT FALCON *Falco rufigularis*

PA: Prov. Manuripi, Río Madre de Dios, Santa Rosa (12°13′S, 68°24′W), 180 m, 3 August 1986, collected by L. A. Ruedas (CBF 0423). This represents the first specimen for PA; Remsen *et al.* (MS) reported the first sight record for PA. The species is distributed throughout lowland Bolivia having been recorded previously in BE, CH, CO, LP, SC and TA (Remsen & Traylor 1989).

GREATER RAZOR-BILLED CURASSOW *Mitu tuberosa*

PA: Prov. Manuripi, Río Manuripi, Puerto Cardenas (11°21′S, 67°45′W), 162 m, 14 October 1991, JS recorded a hunter-killed individual. An adult domesticated bird was photographed (CBF) at Puerto Limón (10°59′S, 66°24′W), Río Madre de Dios, 130 m, 19 October 1991. Previous records are from Amazonian lowland habitats in BE, CO, LP and SC (Remsen & Traylor 1989).

COMMON MOORHEN *Gallinula chloropus**

OR: Prov. Cercado, Lago Uru Uru, 6 km by road SW of Oruro (17°59′S, 67°10′W), 3700 m, 13 November 1991, one individual seen by JS and S. Barrera. Distributed patchily in the puna zone of the Andes (Fjeldså & Krabbe 1990), previous records from the Bolivian puna include LP (Serrano & Cabot 1982; Remsen *et al.* 1985) and PO (Bond & Meyer de Schauensee 1943). The species also has been recorded for CH, CO, SC and TA (Remsen & Traylor 1989).

PURPLE GALLINULE *Porphyrula martinica**

BE: Espíritu, near Río Yacuma, one individual observed several times between February and April 1990 by WH. This is apparently the second record for BE: Remsen (1988) reported the first sight record. The species also has been recorded from Amazonian lowland habitats in LP and SC (Remsen & Traylor 1989).

SUNGREBE *Heliornis fulica**

PA: Río Madre de Dios, 29 September 1991, two individuals seen along the shore by JS. Río Manuripi, Puerto Cardenas (11°21′S, 67°45′W), 162 m, 14 October 1991, one individual seen by JS in a backwater with floating vegetation (*Eichornia crassipaes*). Previous records are from lowland habitats in BE, CO, LP, SC and TA (Remsen & Traylor 1989).

BLACK-NECKED STILT *Himantopus mexicanus*

BE:Espíritu, 5 September 1985, collected by WH (CBF 0976). The greyish-white crown of this specimen indicates the southern form *melanuras* (Blake 1977). This represents the first documented record for BE; Parker (1989) reported a sight record. The species also has been recorded from CO, LP, OR, SC and TA (Remsen & Traylor 1989).

SOLITARY SANDPIPER *Tringa solitaria*

BE: Espíritu, 10 January 1983, collected by WH (CBF 1725). This represents the first specimen for BE. Pearson (1975) and Remsen (1986) previously reported sight records of this northern migrant for BE from November to March. It has been recorded from lowland habitats throughout Bolivia (Remsen & Traylor 1989).

BLACK SKIMMER *Rynchops niger**

PA: Río Madre de Dios, 27 September to 2 October 1991, fairly common, sight record by ORO. Previous records include BE, CO, LP, OR and SC (Remsen & Traylor 1989).

PICUI GROUND-DOVE *Columbina picui**

OR: Prov. Avaroa, Río Tacagua, 6 km by road N of Challapata (18°45′S, 66°50′W), 3800 m, 13 November 1991, JS saw a group of 10 individuals in a fallow field. This widespread species now has been recorded from all departamentos in Bolivia, from a variety of habitats ranging from lowland to puna regions (Remsen & Traylor 1989).

RED-AND-GREEN MACAW *Ara chloroptera*

PA: Prov. Manuripi, Río Madre de Dios, Arroyo Tulupa, 8 km SW of Santa Rosa (12°13′S, 68°24′W), 180 m, 8 October 1991 (CBF recording). Previous records are from Amazonian lowland habitats in BE, CO, LP and SC (Remsen & Traylor 1989).

PAINTED PARAKEET *Pyrrhura picta*

PA: Prov. Manuripi, Río Madre de Dios, Puesto Castañero Chive, 15 km by road NW of Puerto Camacho (11°31′S, 67°42′W), 164 m, 126 October 1991 (CBF recording). The species previously has been recorded from Amazonian lowland habitats in LP and SC (Remsen & Traylor 1989).

LEAST PYGMY-OWL *Glaucidium minutissimum*

BE: Serranía Eva Eva, 22 October 1990 (CBF recording). The locality is the southernmost record for Bolivia. Previous records are from Amazonian lowland habitats in LP and PA (Remsen & Traylor 1989).

SHORT-EARED OWL *Asio flammeus*

LP: Prov. Aroma, Kulli Kulli (17°27′S, 67°37′W), 4 km S of Huaraco, 3800 m, 2 February 1992, collected by ORO and E. Peñaranda (CBF 2331). Three individuals were seen by ORO and Peñaranda and an active nest was found. The nest, on the ground hidden by a mat of grass (*Calamagrostis* sp.), contained two white eggs. First reported for Bolivia (CO) by Remsen *et al.* (1986), this is apparently the second locality for the country and the first for LP. The species occurs sporadically throughout the Andes (Fjeldså & Krabbe 1990).

OILBIRD *Steatornis caripensis*

CO: Prov. Chapare, Cavernas de San Rafael, 7 February 1988, collected by E. Flores (CBF 0614). Sight records have been reported for CO (Remsen *et al.* 1986) but this apparently represents the first specimen for the departamento. The species also has been recorded in suitable habitat in LP and SC (Remsen & Traylor 1989).

GREAT POTOO *Nyctibius grandis*

CO: Prov. Ayopaya, Seque Rancho (16°40′S, 66°45′W), 1050 m, 23 August 1992, collected by K. Smith and M. Blair (CBF 2417). Previous records include BE, LP, PA and SC (Remsen & Traylor 1989).

SEMICOLLARD NIGHTHAWK *Lurocalis semitorquatus*

BE: F. Steinbach collected two specimens from CO (Remsen pers. comm.) before the BE record reported by Parker *et al.* (1991); hence, Steinbach's records represent the first for Bolivia. The CO specimens were collected 4 October 1939 and 16 June 1956 in Prov. Cercado; they are deposited at the Louisiana State University Museum of Zoology (LSUMZ 36891, 37344). A second specimen from BE was collected by ORO on 22 October 1990 at Serranía Eva Eva (CBF 1621). Sight records have been made from PA (Remsen & Traylor 1989) and northeastern SC (Parker *et al.* 1991).

SAND-COLOURED NIGHTHAWK *Chordeiles rupestris*

PA: Prov. Manuripi, Río Madre de Dios, Independencia (11°26′S, 67°34′W), 170 m, 7 August 1986, collected by S. Anderson (CBF 1814). Previous records are from Amazonian lowland habitats in BE, CO, LP and SC (Remsen & Traylor 1989).

BAND-TAILED NIGHTHAWK *Nyctiprogne leucopyga**

PA: Río Madre de Dios, ORO observed one individual in acrobatic flight, low over the river on 28 September 1991, and another on 10 October 1991 at Puerto San Miguel (11°37′S, 67°47′W), 165 m. These are the first records for PA and the westernmost records for the species. The first Bolivian specimens were collected in 1964 by J. Cuello along the Río Iténez, BE (Parker *et al.* 1991). Recent sight records have been made along the Río Iténez, BE (Parker *et al.* 1991) and the Río Paragua, SC (Bates *et al.* 1989).

SILKY-TAILED NIGHTJAR *Caprimulgus sericocaudatus*

PA: Prov. Manuripi, Río Madre de Dios, Puesto Castañero Chive, 15 km by road NW of Puerto Camacho (11°31′S, 67°42′W), 164 m, 15 October 1991, collected by ORO (CBF 2592). This apparently represents the second locality for Bolivia and the first for PA. A rare species known from only a few localities in South America, it was first reported for Bolivia from LP (Schulenberg & Remsen 1982).

BAND-WINGED NIGHTJAR *Caprimulgus longirostris*

OR: Prov. Avaroa; 10 km by road NW of Challapata (18°45′S, 66°50′W), 3700 m, 18 April 1992, collected by SED (CBF 2546). The species previously has been recorded from the puna zone of Peru, western Bolivia and Argentina (Fjeldså & Krabbe 1990); records for Bolivia also include CO, LP and SC (Remsen & Traylor 1989).

LADDER-TAILED NIGHTJAR *Hydropsalis climacocerca*

PA: Prov. Madre de Dios(?), (11°20′S, 66°22′W), 13 June 1987, collected by G. W. Graffin (CBF 2591); the specimen tag reads "Río Madre de Dios" but the locality described by the coordinates is on the Río Beni, Prov. Madre de Dios. This is the first specimen for PA. Remsen *et al.* (MS) reported the first sight record for PA. The species also has been recorded from Amazonian lowland habitats in BE (Parker *et al.* 1991), CO, LP and SC (Remsen & Traylor 1989).

WHITE-BELLIED WOODSTAR *Acestrura mulsant*

SC: Prov. Caballero, Comarapa, El Tunal, 17°55′S, 64°30′W, 2000 m, 21 December 1988, collected by F. Hinojosa (CBF 1973). Previous records include CO and LP (Remsen & Traylor 1989).

WHITE-TAILED TROGON *Trogon v. viridis*

LP: Aserradero San Franciso, 12 August 1990, collected by JS (CBF 2171). This represents the first specimen for LP. Parker (MS) reported the first sight record for LP and Parker & Bailey (1991) the first documented record based on a voice recording. The species also has been recorded in Amazonian lowland habitats in BE, PA and SC (Remsen & Traylor 1989).

RUFOUS MOTMOT *Baryphthengus martii*

BE: Serranía Eva Eva, 23 October 1990, collected by ORO (CBF 1619). Previous records include CO, LP, PA and SC (Remsen & Traylor 1989).

GREEN-AND-RUFOUS KINGFISHER *Chloroceryle inda*

LP: Aserradero San Francisco, 15 August 1990, collected by JS (CBF 2167). This represents the first documented record for LP. Parker & Bailey (1991) previously reported a sight record for LP. The species also has been recorded from Amazonian lowland habitats in BE, CO, PA and SC (Remsen & Traylor 1989).

CURL-CRESTED ARACARI *Pteroglossus beauharnaesii*

LP: Aserradero San Francisco, 20 August 1990, a pair collected by JS (CBF 1646, 1653). These represent the first specimens for LP. First reported for LP from sight records (Parker MS), Parker & Bailey (1991) documented the record with voice recordings. Previous records also include BE, CO and PA (Remsen & Traylor 1989).

RINGED WOODPECKER *Celeus torquatus*

SE: Serranía Eva Eva, 24 October 1990 (CBF recording). Previous records are from Amazonian lowland habitats in LP, PA and SC (Remsen & Traylor 1989).

SPECKLED SPINETAIL *Cranioleuca gutturata*

BE: Prov. Ballivián, Colegio Técnico Agropecuario Río Colorado (14°55′S, 67°05′W), 35 km by road N of Yucumo, 300 m, 14 February 1992, collected by K. Smith (CBF 2351). Previous records are from Amazonian lowland habitats in CO, LP and PA (Remsen & Traylor 1989).

FASCIATED ANTSHRIKE *Cymbilaimus lineatus*

PA: Prov. Manuripi, Río Madre de Dios, Puesto Castañero Chive, 15 km by road NW of Puerto Camacho (11°31′S, 67°42′W), 164 m, 20 October 1991, collected by ORO (CBF 2214). This represents the first documented record for PA and apparently one of a few localities for the country. Sight records have been reported for PA (Remsen *et al.* MS) and BE (Parker 1989), and records based on specimens for LP (Bond & Meyer de Schauensee 1943, Parker & Bailey 1991).

UNDULATED ANTSHRIKE *Frederickena unduligera*

BE: Serranía Eva Eva, 22 October 1990 (CBF recording). The locality is the southeasternmost record. First recorded for Bolivia from Alto Madidi, LP (Parker *et al.* 1991), this is the second record for the country of this uncommon species.

PLAIN ANTVIREO *Dysithamnus mentalis*

BE: Prov. Yacuma, Estación Biológica del Beni (14°38'S, 66°18'W), 210 m, 21 December 1988, collected by ORO (CBF 1547); Prov. Moxos, San Lorenzo (15°46'S, 65°26'W), 175 m, 29 May 1992, collected by K. Smith (CBF 2526). These are the first specimens for BE; Parker (1989) reported the first record for BE based on voice recordings. Previously recorded from the foothills and eastern slopes of the Andes (CO, LP and SC), these apparently are the first records of the species in lowland habitats away from the Andes (Remsen & Traylor 1989).

LARGE-BILLED ANTWREN *Herpsilochmus longirostris*

BE: Espíritu, 23 July 1987, a pair collected by WH (CBF 1133, 1276). This is the westernmost confirmed locality for the species, and one of a few for the country. First collected in Bolivia along the Río Iténez, northeastern BE, sight records for western BE were made by Remsen (see Bates *et al.* 1992). Recently the species was recorded from northeastern Bolivia in BE (Parker & Rocha 1991) and SC (Bates *et al.* 1992).

RUFOUS-WINGED ANTWREN *Herpsilochmus rufimarginatus*

PA: Río Madre de Dios, Puerto Remanso (10°57'S, 66°18'W), 130 m, 21 September 1991 (CBF recording). Previous records are for BE, LP and SC (Remsen & Traylor 1989).

PLUMBEOUS ANTBIRD *Myrmeciza hyperythra*

LP: Aserradero San Francisco, 6 August 1990, collected by JS (CBF 1644). This represents the first specimen for LP. Parker (MS) first reported a sight record for LP and Parker & Bailey (1991) documented the record with voice recordings. Previous records also include BE and PA (Remsen & Traylor 1989).

SOOTY ANTBIRD *Myrmeciza fortis*

LP: Prov. Franz Tamayo, Río Tuichi, Campamento Santa Rosa (14°27'S, 67°53'W), 336 m, 14 October 1992, collected by M. Blair (CBF 2519). This is the southernmost known locality for this species and apparently the third locality for Bolivia (Parker *et al.* 1991). Parker & Remsen (1987) reported the first record for Bolivia from PA and Parker *et al.* (1991) reported the first record for LP from Alto Madidi.

RUFOUS-CAPPED ANT-THRUSH *Formicarius colma*

LP: Prov. Franz Tamayo, Río Tuichi, Campamento Santa Rosa (14°27'S, 67°53'W), 336 m, 14 October 1992, collected by M. Blair

(CBF 2520). This is the southernmost known locality for this species and one of a few localities for the country; also the first specimen for LP. The species was first recorded for Bolivia from PA (Parker & Remsen 1987), and Parker (MS) and Parker & Bailey (1991) reported sight records for Alto Madidi, LP.

TAWNY-CROWNED PYGMY-TYRANT *Euscarthmus meloryphus*

PA: Prov. Manuripi, Río Madre de Dios, Humaita (12°02′S, 68°11′W), 224 m, 29 August 1985, collected by E. Flores (CBF 0270). This is the first specimen for PA. Remsen *et al.* (MS) reported the first record for PA based on voice recordings. Previous records also include BE, SC and TA (Remsen & Traylor 1989).

OLIVACEOUS FLATBILL *Rhynchocyclus olivaceus*

PA: Prov. Manuripi, Río Madre de Dios, Puesto Castañero Chive, 15 km by road NW of Puerto Camacho (11°31′S, 67°42′W), 164 m, 20 October 1991, collected by ORO (CBF 2275); Río Madre de Dios, Puerto Remanso (10°57′S, 66°18′W), 130 m, 21 October 1991, collected by ORO (CBF 2269). Previously recorded for CO and LP, these apparently are the first records of the species away from the foothills of the Andes (Remsen & Traylor 1989).

GREY-CROWNED FLYCATCHER *Tolmomyias poliocephalus*

BE: Serranía Eva Eva, 22 October 1990 (CBF recording). Previously recorded from Amazonian lowland habitats in LP and PA, this apparently is the southernmost record for the species in Bolivia (Remsen & Traylor 1989).

WHITE-CRESTED SPADEBILL *Platyrinchus platyrinchos*

BE: Serranía Eva Eva, 23 October 1990 (CBF recording). Previously recorded from Amazonian lowland habitats in LP and PA, this apparently is the southernmost record for the species (Remsen & Traylor 1989).

ALDER FLYCATCHER *Empidonax alnorum*

LP: Prov. Larecaja, Tomachi (15°28′S, 67°45′W), 520 m, 13 March 1983, collected by E. Flores (CBF 0164). This northern migrant previously has been recorded from lowland habitats in BE, CH, CO, PA and SC (Remsen & Traylor 1989).

BRIGHT-RUMPED ATTILA *Attila spadiceus*

BE: Prov. Ballivián, Colegio Técnico Agropecuario Río Colorado (14°55′S, 67°05′W), 35 km by road N. Yucumo, 300 m, 14 February 1992, collected by K. Smith (CBF 2350). This is the first specimen for BE. The first record for BE was based on a voice recording (Parker 1989). Previous records also include CO, LP, PA and SC (Remsen & Traylor 1989).

SULPHUR-BELLIED FLYCATCHER *Myiodynastes luteiventris*

LP: Prov. Sud Yungas, Puente Solacama, 30 km by road N of Irupana (16°25′S, 67°28′W), 1289 m, 7 January 1989, collected by

V. Baptista (CBF 0691). This represents the first specimen for LP. The first record for LP was based on a voice recording (Parker & Bailey 1991). Previous records for this northern migrant include BE, CO and SC (Remsen & Traylor 1989).

CHESTNUT-CRESTED COTINGA *Ampelion rufaxilla*

CO: Prov. Chapare, Inca Chaca, Tablas Monte (17°14′S, 66°10′W), 2600 m, 17 October 1991, collected by S. Arias and J. Fjeldså (CBF 2115). This is apparently one of a few records for Bolivia; previous records are for LP (Remsen & Traylor 1989, Parker & Bailey 1991). The species occurs scattered throughout the Andes (1860–2740 m); it is generally uncommon or rare (Fjeldså & Krabbe 1990).

GREY-BREASTED MARTIN *Progne chalybea*

BE: Espíritu, 22 April 1987, collected by WH (CBF 1350). The species has been seen by WH over a number of years (1986–1992), only in April–November when, although rare, it was seen regularly in small numbers (2–6), near buildings; the birds appeared to be paired but no breeding behaviour was observed. This is the first documented record for BE; Pearson (1975) reported the first sight record for BE. Previous records also include CO, PA, SC and TA (Remsen & Traylor 1989).

PALE-FOOTED SWALLOW *Notiochelidon flavipes*

CO: Prov. Chapare, Inca Chaca, Tablas Monte (17°14′S, 66°10′W), 2700 m, 18 October 1991, collected by J. Fjeldså (CBF 2108). This represents the first specimen for Bolivia. Previous sight records are from the humid temperature zone in CO, LP and SC (Remsen & Traylor 1989).

LAWRENCE'S THRUSH *Turdus lawrencii*

LP: Prov. Franz Tamayo, Río Tuichi, Campamento Santa Rosa (14°27′S, 67°53′W), 336 m, 11 October 1992, collected by M. Blair (CBF 2515). This represents the first specimen for Bolivia and the locality is the southernmost record (Parker *et al.* 1991). The species previously has been documented by voice recordings in LP (Parker *et al.* 1991, Parker & Bailey 1991), PA (Parker & Remsen 1987) and BE (Parker MS).

VIOLACEOUS JAY *Cyanocorax violaceus*

LP: Prov. Iturralde, Alto Madidi, Río Enatagua (13°40′S, 68°43W), 370 m, 25 September 1990, collected by F. Guerra (CBF 1616). This represents the first specimen and the second record for LP; it is the third published record for Bolivia. First reported for Bolivia from PA (Parker & Remsen 1987), Parker & Bailey (1991) reported the first record for LP based on a voice recording from the same locality as this specimen.

YELLOW-GREEN VIREO *Vireo flavoviridis*

LP: Prov. Sud Yungas, Concesión Cooperativa Sapecho (15°32′S, 67°21′W), 440 m, 25 January 1991, collected by V. Baptista

(CBF 2588). This northern migrant previously has been recorded for BE, CO and SC (Remsen & Traylor 1989).

SLATE-COLOURED SEEDEATER *Sporophila schistacea*

LP: Prov. Sud Yungas, Colonia Tupiza, 10 km by road SE of Sapecho (15°32′S, 67°21′W), 440 m, 29 and 31 January 1990, V. Baptista collected 3 adult ♂♂, 2 immature ♂♂ and 2 ♀♀ (CBF 1831, 1832, 1937, 1938, 1842, 1843, 1845). The birds were members of a monospecific flock feeding on rice grains in a cultivated field. Flocks of 10–25 individuals were seen regularly in rice fields in the area and the species is considered a pest by local farmers (V. Baptista pers. comm.). Previous records are from Amazonian lowland habitats in BE, CO, PA and SC (Remsen & Traylor 1989).

GREY-HEADED TANAGER *Eucometis penicillata*

LP: Aserradero San Francisco, 9 August 1990, collected by JS (CBF 2161). The species previously has been recorded from lowland habitats in BE, CO, PA and SC (Remsen & Traylor 1989).

GOLDEN-BELLIED EUPHONIA *Euphonia chrysopasta*

BE: Prov. Yacuma, Estación Biológica del Beni (14°38′S, 66°18′W), 210 m, 23 October 1988, collected by ORO (CBF 1564). This specimen represents the first record for BE (Rocha 1988). Parker (1989) subsequently reported a voice recording for BE. The species also has been recorded for CO, LP, PA and SC (Remsen & Traylor 1989).

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An additional subspecies of the Croaking Cisticola from the temperate uplands of southern Africa

by P. A. Clancey

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The Croaking Cisticola *Cisticola natalensis* (Smith), 1843, is the largest-sized member of the genus and has a wide continental range, occupying open grassland habitats and eschewing most wooded savanna types. It was initially made known to science on material of the southern terminal population occurring in Transkei and Natal collected by Dr Andrew Smith during the course of his political mission to Zululand in 1832. In his definitive revision of the genus *Cisticola*, Lynes (1930) accorded nominate *C. natalensis*, the type-locality of which is Durban, Natal, an extensive range, extending in the east well to the north of the Zambezi R. In a more recent assessment of the species' geographical variation, Traylor (1986), following Clancey (1969), restricts *C. n. natalensis* to regions lying well south of the Zambezi from the plateau of Zimbabwe and Mozambique south of the Save R. to the eastern Cape, Transkei, Natal, Swaziland and the eastern Transvaal. Still more recent study into the present cisticola's subspeciation levels reveals that four rather than three races should be recognised in the Southern African Subregion alone, one of which will require to be given a name.

The disrupted range of *C. natalensis* in the southern third of Africa, as demonstrated in Hall & Moreau's *Atlas* of 1970, shows the species in the south of its range distributed from sea level to 1525 m in the high interior, this translating into a mosaic of populations varying in the intensity of the dorsal streaking and ground colouration. Subspecifically relevant variation is well-shown in freshly moulted non-breeding dress material but to a reduced extent in the strikingly different breeding plumage, both plumages in turn being rapidly affected by both fading through exposure to the sun and grass abrasion. These changes need to be taken into account in subspeciation studies. It is now found that the nominate race is relatively reddish or ochreous tawny and finely streaked over the upper-parts in fresh non-breeding dress (late April–June) and is confined to the humid coastlands from about the Kei R. of the eastern Cape-Transkei border, north to the Lebombo Mtns and the Mozambique lowlands from Maputo Bay southwards. The birds breeding over the temperate eastern highlands of the Transvaal and much of the Zimbabwean plateau to the north of the Limpopo R. are paler and more heavily streaked in comparison, distinctly less reddish, and may now take the name

Cisticola natalensis vigilax subsp. nov.

Type. ♂, adult. "The Downs", southwest of Tzaneen, Transvaal, at 24°08′S, 30°11′E, 1371 m a.s.l., 24 September 1974. Collected by

P. A. Clancey. In the collection of the Durban Natural Science Museum, D. M. Reg. No. 30017. Gonads noted as enlarging.

Description. Differs from *C. n. natalensis* in non-breeding dress (late April–June) in having the ground-colour of the upper surface much less reddish and more stone-coloured, the shaft-streaking broader and blacker, that over the hind-neck less suppressed. Over the entire dorsal surface the feathers are edged light Cinnamon-Buff or duller, *versus* deep Tawny-Olive in nominate *natalensis* (Ridgway 1912). Rump greyer with little or no tawny overlay, and edging to wing-coverts and remiges lighter and greyer. White below, with reduced buff on breast, sides and flanks. In the breeding dress (from October) not well-differentiated and about as uniform over the upper-parts, but ranging somewhat greyer and more scaled over the mantle. Similar in size.

Compared with *C. n. matengorum* Meise, which replaces it to the northeast, differs in the non-breeding dress in being lighter, less reddish, tawny (feathers in *matengorum* Buckthorn Brown) over the upper-parts, but equally heavily streaked. Buff over underside paler. In the breeding dress lighter and greyer above, the shaft-streaking in *matengorum* broader and brownish black, and with the hind-neck streaking finer and on a light buffish grey ground. In *matengorum* the hind-neck ground-colour and shaft-streaking is consistent with that of the crown, mantle and scapulars. Tail also with smaller black sub-apical spots and paler apices. Similar in size to *matengorum*.

Measurements. Non-br. dress: wings of 19 ♂♂ 69–75 (72.1), s.d. 1.57; tails of 10, 60–69 (64.5), s.d. 2.39. Wings of 4 ♀♀ 58–59.5 (58.6), tails 52.5–60 (54.7) mm.

Material examined. 26 (*Transvaal*: Komati R., Hector Spruit, Nelspruit, Barberton, Sabi Sands Nature Reserve, "The Downs", Groot Spelonken (south of Louis Trichardt); *Swaziland*: Ranches Ltd (Eranchi); *Botswana*: Gaborone; *Zimbabwe*: Matopos (Angelsea Farm), Umvuma, Mt Selinda, Beatrice. Two specimens from northern Zululand appear to be migrants: ♂ Candover, 6 September 1964, and ♂ near Melmoth, 1 July 1951). Also of *C. n. natalensis* 50, *C. n. matengorum* 14, and other taxa 10.

Range: The eastern highlands and adjacent escarpment and immediate lowlands of the Transvaal from about Amsterdam in the south, north to the Soutpansberg (to about 22°30′S (Kemp *et al.* 1985)), adjacent Swaziland, and recorded once in breeding dress from southeastern Botswana (29 July 1910). Re-appears north of the arid Limpopo R. valley over the plateau of Zimbabwe from Matabeleland in the southwest, north to Mashonaland, where meeting and intergrading with *C. n. matengorum* (Irwin 1981). The Candover and Melmoth records mentioned earlier, and mixed samples comprising both examples of *C. n. natalensis* and *C. n. vigilax* from northern Swaziland (Ranches Ltd) and lowland Transvaal, immediately to the north (at Hector Spruit), indicate a measure of cold dry season movement on the part of elements of *vigilax*, from the more exposed grasslands of the eastern Transvaal highlands.

Measurements of the type. Wing 73.5, culmen from base 18, tarsus 30.5, tail 56 (moult) mm. The specimen is in moderately worn dress, but has been selected in order to place the type-locality of the subspecies on the summit grasslands of the eastern high country of Transvaal.

Etymology. *Vigilax* from Latin *vigilare* to be watchful=always on the alert.

Remarks. The established ranges of the four subspecies to be recognised from the Southern African Subregion are summarized hereunder:

(a) *Cisticola natalensis natalensis* (Smith), 1843: Durban, Natal. From the Kei R., on the eastern Cape/Transkei border, to coastal and midland Natal, Zululand, the Lebombo Mtns and southern Mozambique to the Maputo Bay region.

(b) *Cisticola natalensis vigilax* Clancey, 1994: "The Downs", eastern Transvaal, at 24°08′S, 30°11′E. Eastern Transvaal highlands and adjacent escarpment region to the plateau of Zimbabwe, as outlined above.

(c) *Cisticola natalensis holubii* (Pelzeln), 1882: Pandamatenga, north-eastern Botswana. Locally distributed from northwestern Zimbabwe, adjacent northeastern Botswana and southwestern Zambia from the Machili R. at 17°07′S, 25°08′E to Kasusu and Kalomo (Benson *et al*. 1971); also eastern Caprivi Strip, Namibia. Replaced to the north by *C. n. katanga* Lynes, 1930.

(d) *Cisticola natalensis matengorum* Meise, 1934: Nambunchu, Southern Province, Tanzania. Mozambique lowlands from about the Save R., eastern highlands of Zimbabwe from Chipinga northwards, eastern Zambia, Malawi, and southeastern Tanzania to the south of *C. n. littoralis* van Someren, 1943.

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Weights of Bornean understory birds*

by *James C. Gaither, Jr.*

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The forest avifauna of South-East Asia is species rich yet little known; for instance, data on the body weights of understory birds is sparsely represented in the literature and in museums. In this contribution, I present data on the body weights of 41 species of understory birds from lowland forest in West Borneo (Kalimantan), Indonesia.

The data presented here are from a mist-net study of understory birds in the Gunung Palung National Park (1°13′S, 110°7′E). The mist-netting took place in two lowland forest habitats, a peat swamp forest and a dipterocarp forest growing on an alluvial terrace adjacent to the Air Putih River. From December 1986 to July 1987, I operated 10 mist-nets (12 m long, 2.6 m high, 36 mm mesh, 4 shelf) at ground level for 2 days per month in each habitat. All birds were identified, and measured using a Pesola spring balance.

There are some limitations to the data. I did not differentiate males from females, nor did I differentiate adults from immatures. I did not mark individual birds, and thus I may have captured and weighed the same individual bird more than once. Finally, I could not distinguish between *Ceyx erithacus* and *C. rufidorsus* in the field, therefore I lumped the two species together for data collection purposes.

The nomenclature and order follow that of King *et al.* (1975). All measurements are given in grams. For species with 10 or more weights, the data are given in the form: range; mean, standard deviation (sample size).

Chalcophaps indica GREEN-WINGED PIGEON. 89.
Cacomantis merulinus PLAINTIVE CUCKOO. 32.
Alcedo meninting BLUE-EARED KINGFISHER. 31.
Ceyx erithacus/rufidorsus BLACK/RUFOUS-BACKED KINGFISHER. 16, 16, 17, 17, 17, 18, 18, 18, 21.
Lacedo pulchella BANDED KINGFISHER. 50.
Sasia abnormis RUFOUS PICULET. 8, 9, 9, 10, 10, 11.
Meiglyptes tukki BUFF-NECKED WOODPECKER. 46, 47, 51, 52, 53, 53.
Blythipicus rubiginosus MAROON WOODPECKER. 70.
Calyptomena viridis GREEN BROADBILL. 55.
Chloropsis cyanopogon LESSER GREEN LEAFBIRD. 22.
Pycnonotus eutilotus PUFF-BACKED BULBUL. 32, 37, 37.
Setornis criniger HOOK-BILLED BULBUL. 26, 28, 29, 35.
Pycnonotus brunneus RED-EYED BULBUL. 20, 22.
Criniger bres GREY-CHEEKED BULBUL. 32–51; 41.94, 5.26 (n=16).
Criniger phaeocephalus YELLOW-BELLIED BULBUL. 24–40; 32.05, 3.83 (n=41).
Hypsipetes criniger HAIRY-BACKED BULBUL. 16, 16, 17, 17, 17, 18, 19.
Hypsipetes malaccensis STREAKED BULBUL. 34, 37.
Irena puella ASIAN FAIRY-BLUEBIRD. 56.

*Dr J. B. Dunning, Jr. (Department of Zoology, University of Georgia, Athens, GA 30602) has recently published a compilation of bird weights from all hitherto available sources (*CRC Handbook of Avian Body Masses*; CRC Press, 1992). He appeals for new and old unpublished data, for incorporation in future editions. This is therefore the last paper of this kind to be published in the *Bulletin*. Ed.

Pellorneum capistratum BLACK-CAPPED BABBLER. 23–27; 25.10, 1.52 (n=10).
Trichastoma malaccense SHORT-TAILED BABBLER. 17–26; 21.45, 2.28 (n=20).
Trichastoma bicolor FERRUGINOUS BABBLER. 27, 28, 29, 29, 30, 31, 31, 34.
Trichastoma sepiarium HORSFIELD'S BABBLER. 23–29; 25.46, 2.21 (n=11).
Malacopteron cinereum SCALY-CROWNED BABBLER. 15–21; 18.07, 1.68 (n=56).
Malacopteron magnum RUFOUS-CROWNED BABBLER. 22–34; 27.23, 3.25 (n=26).
Malacopteron albogulare GREY-BREASTED BABBLER. 14–18; 16.47, 1.19 (n=15).
Kenopia striata STRIPED WREN-BABBLER. 19, 20, 20, 20, 21.
Stachyris maculata CHESTNUT-RUMPED BABBLER. 26–33; 29.17, 2.04 (n=24).
Stachyris nigricollis BLACK-THROATED BABBLER. 23–31; 26.23, 2.24 (n=13).
Stachyris erythroptera CHESTNUT-WINGED BABBLER. 12, 13, 13, 13, 13, 14, 14, 14.
Macronous ptilosus FLUFFY-BACKED TIT-BABBLER. 19.
Copsychus malabaricus WHITE-RUMPED SHAMA. 31–42; 36.10, 4.33 (n=10).
Copsychus pyrropygus RUFOUS-TAILED SHAMA. 41, 43, 44, 46.
Enicurus ruficapillus CHESTNUT-NAPED FORKTAIL. 27.
Enicurus leschenaulti WHITE-CROWNED FORKTAIL. 27, 29, 30, 38.
Rhinomyias umbratilis GREY-CHESTED FLYCATCHER. 15–21; 18.23, 1.29 (n=47).
Rhipidura perlata SPOTTED FANTAIL. 13, 16.
Philentoma pyrhopterum RUFOUS-WINGED FLYCATCHER. 17, 19, 19, 20, 20, 21, 21, 22, 22.
Terpsiphone paradisi ASIAN PARADISE-FLYCATCHER. 21.
Hypogramma hypogrammicum PURPLE-NAPED SUNBIRD. 10, 12, 12, 12, 12, 13, 13, 13.
Aethopyga mystacalis SCARLET SUNBIRD. 6.
Arachnothera longirostra LITTLE SPIDERHUNTER. 9–16; 12.60, 1.66 (n=47).
Prionochilus maculatus YELLOW-BREASTED FLOWERPECKER. 6–9; 7.09, 0.71 (n=34).

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Recent extensions of range in the House Crow *Corvus splendens*

by Colin Ryall

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The House Crow *Corvus splendens* has a native distribution stretching from Southern Iran, throughout the Indian Subcontinent to South Yunnan in China, and from Nepal to Sri Lanka. They are versatile human commensals, feeding primarily on refuse supplemented with stolen food, crops, young of domestic fowl, and by predation of smaller birds and invertebrates. In recent decades they have dramatically increased their range and now populate many areas bordering the Red Sea, Indian Ocean and its islands. They have reached Australia on numerous occasions and in 1991 a House Crow arrived in Gibraltar. In most of these sites they have proliferated to pest proportions as crop raiders, destroyers of native avifauna and public health risk, so that control measures have been implemented at several locations.

House crow distribution and status has been reviewed by several authors (Ali & Ripley 1972, Meininger *et al.* 1980, Bijlsma & Meininger 1984, Goodwin 1986, Lever 1987). The following paper updates and supplements these works using both published data and unpublished observations.

Native distribution

The five races of *Corvus splendens* are distinguished primarily on the colour shade of their grey hood, which occupies the nape, upper mantle and upper breast, much as in the Jackdaw *Corvus monedula*. Their distributions are as follows:

C. s. splendens is found throughout India, except for Kerala and the northwest. It is also present in Bangladesh, Nepal, Sikkim, Bhutan and Assam.

C. s. zugmayeri has a westerly range, from Kashmir and northwest India to coastal southern Iran as far as Kharg Island, and north to Khost in Afghanistan.

C. s. protegatus is restricted to Sri Lanka and Kerala, on the adjacent Indian mainland.

C. s. maledivicus is found only in the Maldive Islands.

C. s. insolens has an easterly range, through Burma south to Tennaserrim, southwest Thailand and west Yunnan.

Introduced distribution

The House Crow has, during the past 100 years, become established in many inhabited parts of the Indian Ocean seaboard and its islands. A country by country description follows, giving a brief history and present status.

Middle East

In the last 15 years House Crows have established in all main ports on the Arabian Peninsula whilst remaining absent inland, even in populous areas with plentiful refuse tips and water (M. C. Jennings). Many feed on fish offal and garbage in fishing villages.

Saudi Arabia

The species was first recorded in Jedda in 1978 (Jennings 1981a) and is now a common breeding bird. Baldwin & Meadows (1987) observed a flock of 15 House Crows in the port of Yanbu, 300 km to the north, in 1986. They were first seen in the Eastern Province in 1980 and were breeding by 1983. In 1987, a large flock of 30 birds was seen over Ras Tanura (F. E. Warr). One was also seen travelling aboard the ship *Sea Swallow* out of Colombo and left the ship in the south Red Sea. A few were present in the Gulf of Aqaba town of Haql in 1989 (M. C. Jennings). There are no records of the species more than a few kilometres from the coast.

Oman

Meinertzhagen (1924) described House Crows, resembling *C. s. zugmayeri*, as occasional visitors to Muscat from their native Iran. Later (Meinertzhagen 1954) he noted that they were restricted to the coastal strip. Since then, they have extended only a few kilometres inland, particularly where there are extensive construction works (Walker 1981). Gallagher & Woodcock (1980) regarded the birds as being of the race *zugmayeri* or intergrades with the race *splendens*, and noted that according to locals they had been introduced to control ticks on livestock. Occasional sightings on the island of Al Masirah, 300 km further south, may be as a result of winter movement (Gallagher & Woodcock 1980). They remain absent from southern Oman, however.

United Arab Emirates

Jennings (1981b) found House Crows to be abundant in the late 1960s and early 1970s in coastal villages with palm plantations, along the eastern coast. However, by February 1992 their numbers had become much reduced. M. C. Jennings noted that this coincided with the development of the area from a simple fishing community to a modern residential/tourist area with a corresponding improvement in public hygiene, and a consequent decline in food availability for House Crows. In 1987, they were reported on Das Island, at Abu Dhabi airport and Hatta, Huwailat, a few kilometres inland. Present in Dubai since 1977, they are now locally common there (Richardson 1990).

Bahrain

Although first reported in 1961, House Crows were only recorded intermittently through the 1970s (Nightingale & Hill 1992); but since 1983 they appear to be resident in villages of north Bahrain and there have been periodic breeding records. Small parties are frequently seen in port areas and ship-assisted introductions may occur periodically.

Kuwait

House Crows were first recorded in 1972 and bred in 1983 and 1984. Pilcher (1989) does not, however, consider them as resident and suggests that their seasonal occurrence may reflect migrations from the native population in neighbouring Iran.

Yemen (formerly PDRY and North Yemen)

Barnes (1893) reported seeing House Crows in Aden (formerly in PDRY) in 1866 and 1892 and stated that they had been introduced in the 1840s by an officer from the Bombay Infantry. It is widely believed locally that they were brought there by Parsee immigrants from India to devour the bodies of their dead (Ash 1984). By the 1960s they were common breeding residents in both Aden and Shaykh Uthman and their numbers have now reached pest proportions so that a poisoning programme has been in operation for some years (M. C. Jennings). In Oct–Nov 1989, Jennings found House Crows to be more common at Lahej, 30 km inland, than they were in Aden. A few were also seen 10 km north of Lahej, 40 km from the coast, and constitute the most inland population of the species in Arabia. Elsewhere in the former PDRY, Jennings recorded small numbers of House Crows at Shagra and Mukulla, and a single bird at Ghaydah; these lie 100, 500 and 800 km east of Aden, respectively.

According to Jennings, they have been breeding residents in Hodeidd (formerly in North Yemen) since 1975 and, by 1985, two separate colonies had become established. They also appeared in Al Khawka, on the coast 100 km south, in 1983.

Israel and Jordan

House Crows were recorded in Elat, Israel, in 1976 and bred the following year. They are frequently seen flying between Elat and Aqaba in nearby Jordan where they have also bred (Krabbe 1980). Paz (1987) considered them as sporadic in Elat, but they appear to be established and increasing in Aqaba (A. A. Braunlich). Though there are several reports for Sinai, only that of a pair seen at Nabq in March 1984 is definite (Goodman & Meininger 1989).

Mediterranean Region

Gibraltar

Between 26 March and 5 April 1991 a single bird was recorded on the most southerly tip of the rock, and was noted in *British Birds* (Anon 1992). C. Perez of the Gibraltar Ornithological & Natural History Society stated that the bird was first seen at Point Europa, the most southerly tip of the Island, indicating that it flew ashore from a ship at the first sight of land. Its arrival coincided with the return of a number of British and Canadian warships from the Gulf conflict, and it is likely that the bird originated from the well established population at Suez, unless it was kept as a pet from the Gulf. The bird was wary of the many tourists who visit Europa Point but remained there, always close to the seashore, throughout its brief stay. It was seen occasionally flying out to sea but aborting the flight after 200 m; its final fate is unknown. This represents as yet the only record of the species in the region.

Africa

Egypt

It appears that House Crows first appeared in Suez in 1922, but they were misidentified as Jackdaws until Goodwin (1976) identified them correctly from photographs in 1947. Meininger *et al.* (1980) and

Bijlsma & Meininger (1984) described the spread of the House Crow (ssp. *splendens*) in the area and estimated the 1981 population at 800–850. By 1979, there were breeding populations in several towns along the Red Sea coast from Ismailiya to Quseir 300 km to the south (Goodman & Meininger 1989).

Sudan

House Crows must have been present in Port Sudan long before 1941, when a breeding colony was recorded in the girders of a bridge near the harbour (Kinnear 1942). They have since become numerous in the town (Clarke 1967).

Ethiopia

Urban & Brown (1971) stated that House Crows "may occur" in Mitsiwa (Massawa); they were abundant there by 1984. According to A. Mahamued, they were introduced during the British occupation of Eritrea after the Second World War. Though they reached Assab more recently, they are now plentiful there (R. T. Wilson), and there is an unconfirmed 1985 report of several House Crows at Asmara (A. Muahamed).

Djibouti

Clarke (1967) found several House Crows in Djibouti Town in May 1958 and assumed that they had spread from Aden, 240 km to the northeast. Ash (1985) described them as "extremely common" in the town and on the beach in 1978. By 1987, the population stood at several thousand and was increasing so that control measures were being considered (R. T. Wilson). Welch & Welch (1984) reported about 18 in Obock, a small town on the opposite shore of the Golfe de Tadjou.

Somalia

The arrival in Nov 1950 of four House Crows (ssp. *protegatus*) on a passenger ship from Colombo and their disembarkation at Cape Guardafui is well documented (Davis 1951), though they do not appear to have become established. Ash (1985) referred to an unconfirmed report from 1972 of House Crows damaging dates further north at Buthar, but a search in 1979 revealed no evidence of a population. The species was, however, observed in the small fishing village of Zeilah, in the extreme north, and may well have spread from Djibouti some 50 km distant (Chazee 1987). They are apparently absent from Mogadishu (H. F. Schels).

Kenya

Since their arrival in Mombasa in the 1940s, probably on a ship from the long established population in Zanzibar, House Crows (ssp. *splendens*) have proliferated to pest proportions (Ryall & Reid 1987). In 1991, the population there was estimated at over one million (D. G. Kimanga). Their progressive expansion of range in the area and the establishment in 1977 of a disjunct population in Malindi, also on the coast 100 km further north, is described in detail by Ryall (in press).

Several solitary birds have been reported recently at towns well inland including Nairobi, 500 km NW of Mombasa. These undoubtedly originate from releases, accidental or deliberate, and none appear to have become established to date. Recent reports from more distant locations such as Kisumu and Wajir (G. R. Cunningham van Someren) almost certainly result from misidentification of other *Corvus* species.

Their proliferation has been linked with a decline in the native avifauna in Mombasa, as elsewhere (Ryall 1992). A control programme launched by the Mombasa Municipal Authorities in 1985 met with some success, but appears to have lost impetus since 1988, resulting in a rapid build-up in House Crow numbers (pers. obs.).

Zanzibar & Pemba Island

The introduction of *C. s. splendens* from Bombay in the 1890s by Dr Charlesworth and Sir Gerald Portal, to clean up the refuse of Zanzibar Town (Vaughan 1930), resulted in the establishment of the first population of the species in the African region and has served as a nucleus for introductions to the mainland. Pakenham (1979) related their progressive spread to other settlements on the island. Early attempts at control had little effect on the large population in Zanzibar Town, but a recently launched programme is meeting with considerable success. There has been a concurrent recovery of the native avifauna which had declined during the House Crow's proliferation (Alexander 1991).

Long (1981) stated, on the strength of an unpublished communication from J. G. Williams in 1962, that House Crows were present on Pemba Island, but Pakenham (1979) and other visitors did not find them there. This absence was confirmed in 1986 (A. Southwell) and in 1988 (pers. obs.).

Mainland Tanzania

In 1955, R. Fuggles-Couchman observed a few House Crows, presumably originating from Zanzibar, on a small island adjacent to Dar-es-Salaam. K. M. Howell first saw them in Dar-es-Salaam proper in 1972, where they have subsequently proliferated and spread. By 1988, they numbered 15–20,000 (N. E. Baker) and had spread about 30 km northward and westward. Manyanza (1989) provides information on their distribution in the city. A disjunct population, long established in the coastal town of Tanga, 200 km to the north, probably derives from a separate introduction from Zanzibar. They are still absent from Mtwara, on the coast in the extreme south (K. M. Howell).

Mozambique

In the early 1950s, Dr A. A. da Rosa Pinto shot a House Crow (ssp. *splendens*) on Bazaruto Island, north of Inhambene (P. A. Clancey), but this appears to have been an isolated bird, no further records having arisen from the area. J. C. Sinclair observed a small breeding population on Inhaca Island, 200 km to the south, in late 1976, which according to local inhabitants had been established for many years

(Bijlsma & Meininger 1984). W. L. N. Tickell counted about 50 there in the mid-1980s but found none in nearby Maputo, although Sinclair had seen a few there previously.

Republic of South Africa

The arrival at Durban in 1972 of two House Crows, flying in from the sea, presumably from a ship, was described by Sinclair (1974). They remained in the docks for some weeks until joined by a further three birds, and then moved from the area. Clancey (1974) later saw five including a recently fledged juvenile, though nesting was not observed until 1975 (Cyrus & Robson 1980). Despite attempted eradication by the Natal Parks Department, the species quickly spread and is now well established in the Indian suburbs near Reunion Airport where a roost of more than 500 birds gathers each evening (P. A. Clancey). They are also present in the north of the city, and W. L. N. Tickell estimated the total population in 1987 to be 800–1000 birds.

House Crows also appeared in East London, 500 km to the south, in Nov 1975 (Cyrus & Robson 1980), presumably through a separate introduction. A further bird was recorded in Cape Town docks in Oct 1977 (Bijlsma & Meininger 1984).

Islands of the Indian Ocean

The Seychelles

In 1970, a single House Crow was seen flying from a ship from Bombay to St Anne Island, close to Mahe (Feare & Watson 1984), and another was seen on Bird Island by C. J. Feare in 1978. A further five crows reportedly arrived on Mahe from an Indian cargo vessel in 1977 (Ryall 1987). Despite periodic attempts at control and a bounty of 500 rupees, the crows numbered about 30 in 1986 (L. Chong Seng) and, having later dispersed, have established a widespread albeit sparse population in Mahe (A. P. Skerrett). They are also present on Praslin and breeding has been recorded on Silhouette. Recently, a single bird arrived on the nature reserve of Aride Island (Skerrett & Skerrett 1992).

Mauritius

According to Lever (1987), House Crows were first reported by immigrant Indians in 1810 when the island became a British colony, and further birds appear to have been introduced from Indian vessels in 1910 and apparently on a number of subsequent occasions. Diamond (1987) described their progressive spread to other settlements. Efforts to control them met with partial success though they persisted at Roche Bois until reduced to a single bird during a cyclone in 1947. However, a further two birds flew ashore from the SS *Ikauna* from Colombo in 1950. Feare & Mungroo (1990), in a detailed study of their distribution as part of a new control programme, found House Crows to be restricted to the most populous areas, the total population amounting to 400–600 birds.

Laccadive Islands

The population is not native though there has been some debate as to its origin. Ali & Ripley (1972) ascribed the House Crows to the race *splendens*, but Goodwin (1986) identified them as the Maldive subspecies, *maledivicus*.

Andaman Islands

Colonel P. C. Tyler released House Crows at Port Blair, South Andaman, about 1860 during the time of the convict settlement for sanitary reasons, but they failed to become established (Beaven 1867, Ball 1873). More recently, Pittie (1988) found 6–10 House Crows resident in the grounds of Bay Island Hotel in Port Blair. Their dark neck indicated that they were probably *C. s. protegatus* of Sri Lankan origin or *C. s. insolens* from Burma.

East Asia & Australia

Malaysia

According to Ward (1968) there was a breeding population in Klang, Selangor, as early as 1898. A deliberate introduction of 56 birds from Sri Lanka in 1903, to combat caterpillar plagues, is also documented (Willey *et al.* 1903). Their progressive dispersion through Selangor and establishment in Kuala Lumpur is described by Medway & Wells (1976). House Crows have continued to spread, particularly along the western coast, and now range from Jeram in the north to Malacca in the south and inland to Kulim. There is also a disjunct colony at Johor Bahara on the southern border adjacent to Singapore. By 1986 the Klang population numbered about 20,000 and that at Kuala Lumpur, up to 6000 (Lever 1987). D. R. Wells' monitoring of the House Crow population reveals that populations are still increasing and the spread along the western coast of Malaysia and inland continues unabated.

Singapore

A small colony of House Crows was discovered in trees in the docks in 1948 (Gibson-Hill 1950), and by the late 1960s a roost of 200–400 birds had developed at the same site (Ward 1968). They most probably arrived on ships (Medway & Wells 1976). In 1987, C. J. Hails estimated the population at between 1800 and 3700, the lower than expected number being attributable to efficient refuse clearance on the island. He thought that most of the crows were flying in from roosts in adjacent Johor Bahara, Malaysia, where ample refuse has allowed a substantial population to develop.

Thailand

Though Peters (1962) suggested that the House Crows (of the race *insolens*) present in southwestern Thailand may have been introduced by man, the contention was not referred to by Lekagul & Cronin (1974) who described them as rare residents.

Hong Kong

Solitary House Crows of unspecified race and unknown origin were recorded at Kowloon Tong in Nov 1974 and Mai Po in Nov 1980. As Chalmers (1986) indicated, like many other exotics in the area, they may have been released by bird collectors. D. S. Melville also recalled the shipment of about 100 House Crows in the mid-1970s for use in the making of a film, though none apparently escaped. The coastal location of these sites makes ship-borne transport a likely origin in both cases; perhaps from the introduced population on the Malaysian Peninsula. A 1989 record of two House Crows in Kowloon Tong may have resulted from a deliberate release as this area has a high population of Indians (D. S. Melville).

Australia

House Crows have arrived in Western Australia and Victoria on many occasions during this century on board ships from India and Sri Lanka, but largely due to the vigilance of the authorities, who shot 31 in W Australia between 1950 and 1975 (Frith 1976/7), they have failed to become established there. Several of these ship-borne arrivals to Western Australia are very well documented, e.g. Hylton (1927), McGill (1949), Ruddiman (1952). In Victoria, Gibson (1961) reported the arrival of three House Crows at Geelong, near Melbourne, on a ship from Colombo. Further birds were sighted in the Melbourne area in the years following (Smith & Anderson 1967, Long 1967).

Conclusions

House Crows are spreading in most of their introduced range. As commensals to man they flourish in areas of poverty and disorganisation. In Africa, human populations are burgeoning and the House Crow's range is expanding accordingly along coastal settlements and inland. Ultimately they are likely to arrive in Madagascar via ships from the Indian Subcontinent, as was the case in the Seychelles, or from colonies on the African mainland. The spread of House Crows to northern Egypt has facilitated their appearance in the Mediterranean region; at Gibraltar in 1991. In Malaysia too they are expanding their range and will probably eventually spread by ship-assisted passage to the more populous parts of Sumatra only 100 km across the Straits of Malacca from Klang.

The pest status of the House Crow is universally recognised (Ryall in press) and control measures have been taken in many of the locations to which they have been introduced. They are crop raiders, killers of livestock, stealers of food and, concomitant with their proliferation, there is usually a marked decline in native avifauna. Fortunately, the potential threat to the endemic avifauna has been recognised in Mauritius and a control programme has been launched, but the population in the Seychelles continues to spread unabated. The potential establishment of the House Crow in Madagascar calls for constant vigilance on the part of the authorities and international conservation bodies.

From the human perspective, it is Africa where the House Crow should be viewed with most concern. The poverty and overcrowding in many areas is an ideal breeding ground for House Crows, exacerbating existing problems. Their spread is being facilitated further by the burgeoning human settlements along highways all over that continent.

Measures need to be taken to reduce House Crow populations in many areas, and to put a halt to the dispersion of the species particularly on board ships from India and Sri Lanka.

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First records of the Bay-vented Cotinga *Doliornis sclateri* in Colombia

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The Andean cotingas in the genera *Ampelion, Doliornis* and *Zaratornis* form a natural group of four species with a controversial taxonomic treatment. The distribution of these cotingas ranges from northern Colombia and western Venezuela south to central Bolivia where they inhabit isolated woodlots above timberline and cloud forests at high elevations. The overall plumage of both sexes is inconspicuous except for a nuchal crest which is usually folded but striking when displayed. All species are mainly frugivorous and are usually found in pairs, although occasionally they are found in groups at fruiting trees (Parker 1981, Snow 1982, Hilty & Brown 1986). The Bay-vented Cotinga *Doliornis sclateri* was described by Taczanowski (1874) who suggested a close relationship with *Ampelion*. Later, *Doliornis* was merged in *Ampelion* by Bond (1956). The main external difference between the two genera is the narrower, less hooked bill of *Doliornis* (Snow 1982). Recent studies based on electrophoretic, syringeal, and cranial characters support the split of *Doliornis* (one species) from *Ampelion* (two species), within a monophyletic group including the genera *Zaratornis* (one species) and *Phytotoma* (three species) (Lanyon & Lanyon 1989).

Doliornis sclateri is a rare species with a local distribution. In Peru, it is known from the eastern slopes of the Andes in the Departments of Huánuco, Junín and La Libertad, where it inhabits the upper limit of the temperate cloud forest at or near timberline from 2500 to 3300 m (Parker 1982). The species has recently been observed in extreme southern Ecuador in Podocarpus National Park, Loja Province (Fjeldså & Krabbe 1990). Here I report the first sightings of this species in Colombia.

On 31 August 1989 I observed, at close range, a Bay-vented Cotinga at 3530 m altitude, in the Reserva Natural Cañon del Quindío (*c.* 4°37′N, 75°28′W), Municipality of Salento, Quindío Department on the western slope of the Cordillera Central. The bird was quietly perched on the top of a very dense thicket about 1.5 m high at the edge of a forest heavily covered with mosses and other epiphytes. Predominant trees at the site included species of *Weinmannia, Freziera* and *Polylepis*.

At the same locality on 23 October 1989, J. Pérez and I observed a pair of *Doliornis* at a distance of 5 m. The birds were feeding on whitish fruits of a small tree (*Miconia chlorocarpa*). Afterwards they flew away without having called. This second sighting was at 3620 m on the ridge of the Cordillera Central about 0.5 km from the first locality, on the border between Quindío and Tolima Departments. The two birds were at the paramo-forest ecotone (treeline), in a low impenetrable thicket of small trees and bushes. This low forest is frequently buffeted by wind and covered with mist. Several species of shrubby Melastomataceae and Ericaeae are numerous, as well as species of *Weinmannia, Hesperomeles* and *Hedyosmum*, all of which are covered with abundant mosses, lichens and some orchids; the adjacent paramo is characterized by grasses (*Calamagrostis*), shrubs (*Hypericum*), terrestrial bromeliads (*Puya*), and *Espeletia hartwegiana*, among other species (for further details see van der Hammen *et al.* 1983). In early 1991, another Bay-vented Cotinga was observed at a lower elevation farther north in the Reserva Natural Cañon del Quindío by K. Schultze (pers. comm.); this individual was at forest edge feeding on white fruits, probably those of *Tournefortia* sp. (S. Arango pers. comm.).

The two individuals observed on 23 October were an adult and juvenile by plumage (see Fjeldså & Krabbe 1990). The adult had black lores, crown and forehead, dark grey upperparts, and brown rump. Its underparts were chestnut, including undertail coverts and belly up to the lower breast. The adult's nuchal crest was folded although blown by the wind. The juvenile coloration was similar to that of the adult, except that the crown was grey instead of black; I did not observe a nuchal crest.

Fjeldså & Krabbe (1990) suggested that the sightings of *Doliornis* in southern Ecuador could represent an undescribed species of *Doliornis*, although specimens are needed to confirm this possibility. Interestingly those birds I observed in Colombia differed conspicuously from specimens from Peru, the latter having the upper back as well as the rump dark grey while the Colombian birds had dark grey backs and brown rumps.

Observations of *Doliornis* described here are similar to those reported from Peru (Parker 1982, Fjeldså & Krabbe 1990). All sightings occurred in forest at or close to treeline. Other sightings also described these birds as rather inactive, remaining quiet and motionless for periods of time on the top of trees and shrubs at forest edge or close to it. In Alto Quindío *Doliornis* is sympatric with the more common Red-crested Cotinga *Ampelion rubrocristatus*, which is found from treeline down to 2600 m. Both species are of about the same size and shape. *Doliornis* can be easily distinguished from *A. rubrocristatus* by its darker upperparts, chestnut underparts, absence of a white patch on the tail, and its less obvious thinner bill.

Doliornis sclateri is a rare species in the Alto Quindío region. I observed it only twice (3 individuals) during 42 bird censuses (or 0.3 individuals per 10 km of transect) conducted over a period of 13 months in high-altitude forest and paramo-forest ecotone. Although I may have overlooked it at times because of its cryptic coloration and lethargic, silent habits, the very low frequency of observation offers an index of the species' abundance. I never found it at lower elevations, although I regularly conducted censuses down to 2500 m.

The above observations are the first records of *Doliornis* in Colombia and in the northern hemisphere. They represent a northerly range extension of more than 1000 km from the northernmost published locality in Podocarpus National Park, Loja, southern Ecuador (Fjeldså & Krabbe 1990). The species will probably be found in other high Andean forests in the Cordillera Central of Colombia and less likely on the Cordillera Oriental or Cordillera Occidental of Colombia.

Although the Colombian avifauna is one of the largest in the world, with 1745 species presently recorded (Carrizosa & Hernández 1990), it remains relatively understudied. New species and new records for the country are still being reported in regions not far from major cities (Renjifo 1991, Stiles 1992). Of special interest are the forests of the Andean region and its foothills, not only because of the extraordinary array of habitats and diversity of fauna that they support, but also because of the need to improve the effectiveness of current protected areas and to establish new ones. The finding of the Bay-vented Cotinga is an indication of the unreported, unknown diversity of forests that are disappearing at an alarming rate as a result of habitat destruction.

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Garden Warblers *Sylvia borin* in the southwestern Cape Province, South Africa

by C. G. C. Martin, G. D. Underhill & L. G. Underhill

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During winter, Garden Warblers *Sylvia borin* occur in bushes, thickets and forest edges in Africa south of the Sahara with the southern limit of the wintering range coinciding roughly with the boundaries of the Grassland Biome (Moreau 1972, Curry-Lindahl 1981, Maclean 1993). It thus avoids both the Fynbos Biome and the Karoo Biome of southern Africa, vegetation zones which, in their pristine state, consist mostly of low scrub and few trees (Rutherford & Westfall 1986), essentially unsuitable habitat for Garden Warblers (Maclean 1993).

In this note, we report the occurrence of three Garden Warblers at two localities 3.6 km apart near Durbanville (33°51′S, 18°38′E) in the suburbs of Cape Town. This locality is *c.* 600 km from the nearest point in the distribution of Garden Warblers as depicted by Maclean (1993). All three were mist-netted, ringed, measured, weighed and released (Table 1). One of us (CGCM) had ringed Garden Warblers in Malawi, and was present when each bird was caught. Colours of the bill and legs coincided with those described for Garden Warblers in Zimbabwe (Borret 1971). The identification of two was independently assessed from descriptions and measurements by R. K. Brooke; for one of the birds a photograph and a sample of feathers are available. The bird in the Durbanville Nature Reserve was trapped in a mist-net near a fig *Ficus carica* tree in fruit (Underhill 1992), and the two in the Tygerberg Nature Reserve near two species of taaibos (*Rhus rehmanniana* var. *uitenhagensis* and *Rhus laevigata* var. *incana*), indigenous trees 1.0–2.5 m tall, both in berry and dominant in the mist-netting area. Both nature reserves have suburban settings in which planted trees are abundant in gardens and along streets. Under natural conditions the area, including the nature reserves, would be treeless.

The only other record of a Garden Warbler in the southwestern Cape Province was made in dense riparian growth of indigenous trees in fruit *c.* 44 km east of Durbanville in late February 1985, but the bird "did not reveal itself sufficiently for positive identification" (Martin 1986, Hockey *et al.* 1989). However, the bird responded to a recording and "the call on the tape and the call of the bird were very similar". The observer knew the species well in Europe, and given the subsequent occurrence even further west, his conclusion "I have little doubt that it was a Garden Warbler" should be accepted (Martin 1986).

The common factor linking these four reports was the presence of trees bearing fruit. Garden Warblers are omnivorous, and especially at stopover sites during migration they eat fruit to rebuild fat reserves (Bairlein 1987, Thomas 1979).

TABLE 1

Description and measurements (mm) of Garden Warblers mist-netted in the southwestern Cape Province, South Africa

	1	2	3
SAFRING ring no.	A90904	AD21094	AD21112
Place	Durbanville Nat. Res.	Tygerberg Nat. Res.	Tygerberg Nat. Res.
Coordinates	33°51′S, 18°38′E	33°52′S, 18°36′E	33°52′S, 18°36′E
Date	22 December 1990	6 February 1993	27 February 1993
Wing-length	81	—[1]	80
Bill length (to featherline)	10	9	9
Bill colour	upper–grey lower–horn-grey	upper–brown lower–horn	upper–grey lower–brown
Tarsus	22	21	22
Legs	grey with bluish tinge	grey	greyish-brown
Tail	58	63	60
Eye	dark brown	brown	brown
Mass (g)	23.9[2]	19.0	20.0
Primary moult	no moult	555555441	no moult

[1]Longest primary in moult
[2]The value of 29.2 g in Underhill (1992) is incorrect

Hockey *et al.* (1989) listed 92 species with expanded ranges or increased population sizes in the southwestern Cape Province. Of these, 37 were attributed to the replacement of natural fynbos vegetation by alien trees, plantations and gardens. Amongst the best documented of these expansions is that of the Pied Barbet *Lybius leucomelas* (Macdonald 1986). The Garden Warbler thus may become the first Palaearctic migrant on the list of species whose range expansion in the southwestern Cape Province can be attributed, at least in part, to anthropogenic alteration of habitat structure.

Garden Warblers reaching southern Africa come mostly from the eastern part of the breeding range (Moreau 1972). Historically, the breeding range was to the west of the Yenisey River, Russia, but recently the species has spread eastwards across Krasnoyarsk Territory of central Siberia in areas of forest-steppe and the southern zones of the taiga, especially in the regrowth at disturbed sites (Rogacheva 1992). A possible factor contributing to an expansion in the winter range of the Garden Warblers is that man-induced changes in habitat in the breeding area are resulting in increased populations of Garden Warblers from Asia reaching southern Africa. A second possible contributory factor is that extended periods of drought during the 1980s in large areas of southern Africa have reduced the amount of food available in the traditional wintering areas. Drought-related movements of birds into the southwestern Cape (albeit from the arid western areas of southern Africa) have been recorded for several species; notably Dusky Sunbird *Nectarinia fusca*, Black-headed Canary *Serinus alario* and Namaqua Sandgrouse *Pterocles namaqua* (Schmidt 1978, Longrigg & Steele 1978, Hockey *et al.* 1989).

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The reproductive strategies of edible-nest swiftlets (*Aerodramus* spp.)

by P. G. Lee & N. Kang

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The Black-nest Swiftlet *Aerodramus maximus* and the White-nest Swiftlet *A. fuciphagus* are important commercially in south-east Asia as their nests are collected extensively for use in Chinese cuisine and medicine (see Kang *et al.* 1991). They are sympatric in many areas

(King *et al.* 1975) and are similar in some aspects of their behaviour and ecology. Both are aerial insectivores exploiting overlapping feeding niches (Waugh & Hails 1983), and nest colonially in caves or suitable man-made structures (Kang & Lee 1991). The breeding biology of the Black-nest Swiftlet has been studied in Sarawak (Medway 1962a,b, Harrisson 1974), and the White-nest Swiftlet in Penang (Langham 1980). In Singapore, Black- and White-nest Swiftlets often form mixed-species nesting colonies, allowing us to compare reproductive behaviour of the two species under similar conditions. The Black-nest Swiftlet normally lays one egg per clutch while the White-nest Swiftlet lays two. How Black- and White-nest Swiftlets may benefit reproductively from the difference in their clutch-sizes was investigated by clutch manipulation experiments and studying the effect of these experiments on reproductive success. Our results indicate that the clutch-sizes of the two species may be influenced by two factors: (1) the ability of the adults to raise the nestlings, and (2) the insurance against reproductive failure that is provided by laying more than the usual number of eggs in the clutch.

MATERIALS AND METHODS

We studied four mixed-species colonies on the island of Sentosa off the southern coast of Singapore (1°09′N, 13°45′E) in April–June 1984. Twenty-nine 'white' nests belonging to White-nest Swiftlets and 60 'black' nests occupied by Black-nest Swiftlets were numbered and the progress of the clutches contained in them monitored by visiting them twice or three times a week. Disturbance to the colonies was minimized by making the nest visits during the day when the adult birds were absent. Nestlings were weighed with a 10 g or 50 g Pesola balance, and wing-length (as defined by King *et al.* 1975) measured to the nearest mm. The age of nestlings was estimated using the method of Ricklefs (1975). Using measurements obtained from 58 Black-nest Swiftlet nestlings and 48 White-nest Swiftlet nestlings, a graphical plot of wing-length against age was made for each species, and was used for estimating age of subsequent nestlings.

Clutch manipulation experiments were carried out on both species. Care was taken not to disturb the breeding birds by performing the manipulations when the parent birds were away from the colony. Ten additional 'black' and 'white' nests were selected in which the normal clutch-size was enlarged by adding an extra egg. Thus each 'black' nest contained two eggs instead of one, and each 'white' nest three eggs instead of two. The age difference between the added egg and the original clutch ranged from 0 to 9 days. One egg was also removed from another ten 'white' nests, leaving one egg per nest instead of two. Once the clutch had been either 'enlarged' or 'reduced', its progress was monitored to the end of the experiment; lost eggs or nestlings were not replaced. The effects of disturbance caused by the clutch manipulations on the birds were controlled by handling eggs and nestlings from manipulated and non-manipulated nests which contained the normal clutch-sizes in the same way: eggs and nestlings were measured and

TABLE 1

Comparison of the breeding chronologies of Black- and White-nest Swiftlets. The data are presented as mean, s.d. (n). Incubation and fledging periods are calculated using the method of Medway (1962a). The incubation period for the White-nest Swiftlet is the time taken from the laying to the hatching of the first egg; the fledging period is the time taken from the hatching of a nestling to its leaving the nest. For the White-nest Swiftlet, the fledging period is the mean for first and second nestlings combined

	Duration (days)	
	Black-nest Swiftlet	White-nest Swiftlet
Laying interval	—	3.3, 0.4 (7)
Hatching interval	—	3.3, 0.9 (21)
Incubation	25.5, 2.2 (11)	25.1, 0.3 (4)
Fledging	45.9, 2.6 (41)	39.8, 2.6 (20)

weighed and the reproductive success of manipulated nests was compared with non-manipulated nests. Statistical analysis of the data was based on methods described by Sokal & Rohlf (1969), using the statistical computer package SPSS/PC$^+$ (Norusis 1986).

RESULTS

Breeding chronology

Table 1 summarises the breeding chronologies of the two species of swiftlets. The interval between laying the first and second egg for White-nest Swiftlets was found to be around three days, consistent with results reported by Langham (1980). Incubation of the eggs began after the first egg was laid. The two eggs hatched asynchronously with a hatching interval of about three days. The incubation period was similar for the two species ($t=1.69$, $df=9$, $P>0.05$), but the fledging period was longer by around six days for Black-nest Swiftlets ($t=8.53$, $df=23$, $P<0.05$).

Nestling growth

Figures 1 and 2 show the graphical plot of body mass and wing length against age for the Black- and White-nest Swiftlet, respectively. In both species nestling growth, as measured by body mass, appeared to follow a sigmoid curve. Using the method described by Ricklefs (1967, 1983), the Logistic equation was found to provide the best fit to the curve and takes the form:

$$M(t)=A\{1+\exp[-K(t-t_i)]\}^{-1}$$

where $M(t)=$ body mass (g) at age t, $A=$asymptotic or peak nestling body mass (g), $K=$growth rate (per day), $t=$nestling age (days) and $t_i=$age at the point of maximum growth rate (days).

The various nestling growth parameters as described by the Logistic equation are summarised in Table 2. There appears to be little difference in the growth rates between the first and second nestlings of White-nest Swiftlets.

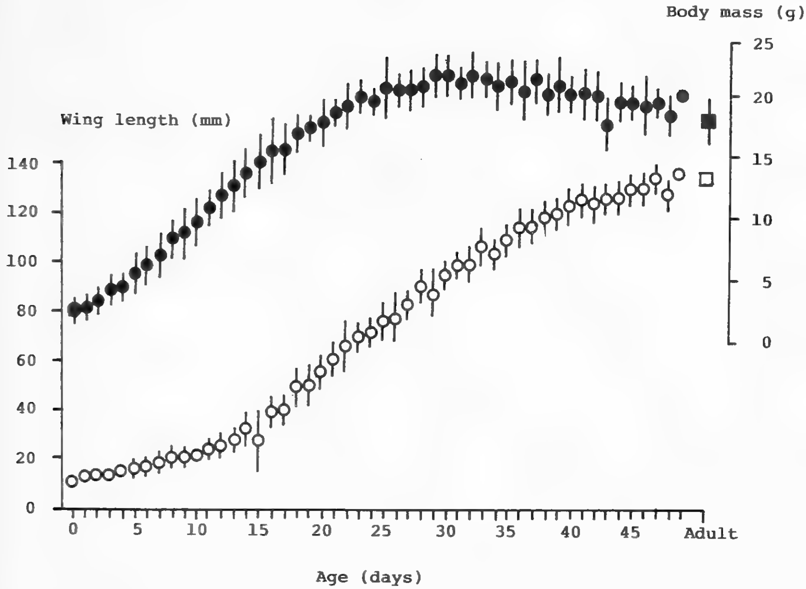

Figure 1. Increase in body mass (●) and wing length (○) of Black-nest Swiftlet nestlings. Adult body mass (■) and wing length (□) are shown. Mean and s.d. (vertical line) are given. Data derived from 58 nestlings.

Clutch manipulation and reproductive success

Three parameters were calculated as indicators of reproductive success: hatching success, nestling mortality and a reproductive index, R, expressed as the mean number of nestlings raised per pair of adults per brood. Hatching success was defined as the percentage of all eggs being monitored that hatched, nestling mortality as the percentage of nestlings that died or disappeared from the nest before they were due to fledge. The reproductive index R combines the effects of hatching success and nestling mortality. Table 3 shows the reproductive success of Black- and White-nest Swiftlets with normal-sized and manipulated clutches. For Black-nest Swiftlets, hatching success was not significantly changed but nestling mortality was significantly increased in 'enlarged' clutches when compared with normal-sized clutches ($\chi^2=13.91$, df=1, $P<0.05$). R was, however, not significantly different between normal-sized and 'enlarged' clutches (one-way ANOVA, $F=2.23$, df=1,68, $P>0.05$). In contrast, for the White-nest Swiftlet, neither enlarging nor reducing the clutch-size appeared to affect hatching success or nestling mortality significantly ($\chi^2=0.17$, df=1, $P>0.05$), but R was significantly larger in 'enlarged' clutches than in 'reduced' clutches (one-way ANOVA, $F=3.46$, df=2,46, Student-Newman-Keuls range test, $P<0.05$).

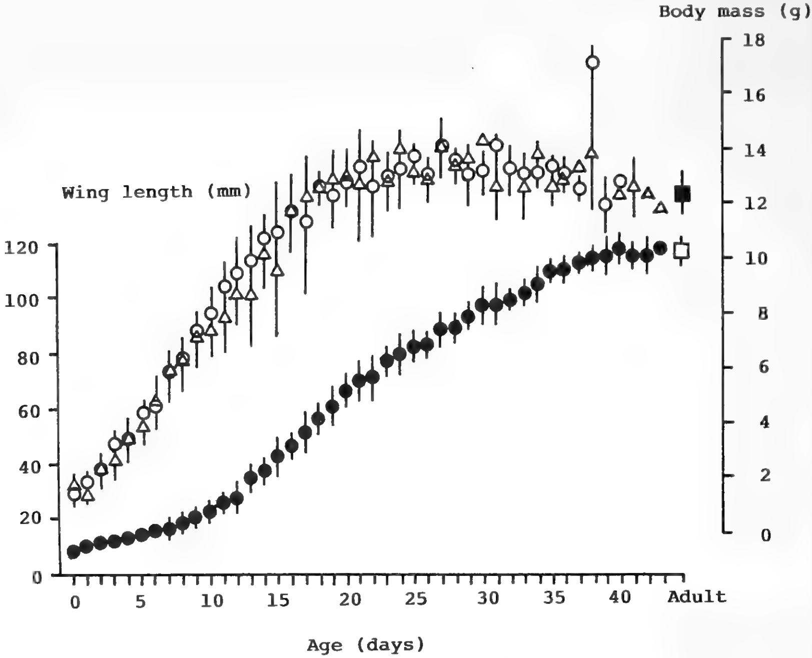

Figure 2. Increase in body mass of first (○) and second (△) nestlings and wing length (●) of White-nest Swiftlet. Adult body mass (■) and wing length (□) are shown. Mean and s.d. (vertical line) are given. Data derived from 48 nestlings. Day 0 for both first and second nestlings is taken as the day on which each nestling hatched.

TABLE 2

Comparison of nestling growth parameters of Black- and White-nest Swiftlets. K=growth rate; A=asymptotic body mass; t_{10-90}=time taken for growth from 10 to 90% A; N=the number of nestlings from which data were obtained

		White-nest Swiftlet	
	Black-nest Swiftlet	1st nestling	2nd nestling
K (per day)	0.178	0.214	0.210
A (g)	22.0	14.5	14.5
Days to reach A	29	28	31
T_{10-90} (days)	25	20	21
N	58	28	20

DISCUSSION

In tropical species of birds of less than 100 g the value of K typically ranges from 0.278 to 0.520 (Ricklefs 1976). Thus, by comparison, the

TABLE 3

Reproductive success of Black- and White-nest Swiftlets with normal sized (N), 'reduced' (RE) and 'enlarged' (E) clutches. N_1=total number of eggs; N_2=total number of nestlings; N_3=total number of nests. Fledging success is expressed as 100% − nestling mortality. Reproductive index, R, is expressed as the number of nestlings (mean, s.d.) raised per adult pair per brood

	Black-nest Swiftlet		White-nest Swiftlet		
Clutch size	1 (N)	2 (E)	1 (RE)	2 (N)	3 (E)
N_1	60	20	10	58	30
Hatching success (%)	97	85	90	83	80
N_2	58	17	9	48	24
Nestling mortality (%)	24	71	56	58	50
Fledging success (%)	76	29	44	42	50
N_3	60	10	10	29	10
R	0.73, 0.45	0.50, 0.53	0.40, 0.52	0.69, 0.76	1.20, 0.63

Black-nest Swiftlet (K=0.178) and the White-nest Swiftlet (K=0.214) have slow growth rates. In nature, both species of swiftlets nest in caves, which tends to exclude most predators of nestlings except man (Medway 1963). The reduced risk of predation may have lifted the selection pressure for fast growth rates (Case 1978). In addition, aerial insectivory may select for slow growth rates as an adaptation to periods of food shortages, because flying insects tend to be an unstable and unpredictable food source (Ricklefs 1969).

Black- and White-nest Swiftlets apparently differ in their reproductive strategies. The Black-nest Swiftlet lays a single, larger egg per clutch (see Kang *et al.* 1991) and apparently concentrates its reproductive effort on the single nestling, as suggested by the clutch manipulation experiments. Whilst it was usually able to raise its normal-sized clutch of one successfully, there was a significant increase in nestling mortality in the 'enlarged' clutches (Table 3).

In contrast, the White-nest Swiftlet lays two smaller eggs per clutch, with a shorter average fledging period than the Black-nest Swiftlet (Table 1) which may increase the possibility of multiple layings (Bryant & Hails 1983). Its reproductive strategy appears to be more opportunistic than that of the Black-nest Swiftlet. In the clutch manipulation experiments, neither hatching success nor nestling mortality was significantly changed in either 'reduced' or 'enlarged' clutches when compared to normal-sized clutches. R was statistically different between 'reduced' and 'enlarged' clutches, with an intermediate value for normal-sized clutches (Table 3). The increase in R in 'enlarged' clutches of the White-nest Swiftlet is in contrast to the Black-nest Swiftlet, where despite the additional egg, R in the 'enlarged' clutches was not significantly different from normal-sized clutches.

The differences in the effect of clutch-size enlargement on the reproductive success of Black- and White-nest Swiftlets may be related to the availability of food for the additional nestlings. Aerial insect density and diversity tend to be higher and more stable near the ground or canopy levels than at higher altitudes (Medway 1962a,b, O'Connor 1975, Hails & Turner 1985). The heights at which different species of aerial insectivores feed may be indicated by two measures of the degree of manoeuvrability in flight: Tail Index (ratio of tail length to body mass) and Wing Index (ratio of wing length to body mass). As suggested by Waugh & Hails (1983) and Hails & Amiruddin (1981), a larger index may indicate a higher degree of manoeuvrability that is advantageous for species that feed close to vegetation. We were unable to observe either species of swiftlets feeding during the day as individuals marked with small coloured streamers did not remain within our range of visibility and the two species are difficult to separate in the field. But measurements of 60 Black- and 54 White-nest Swiftlets showed that they differed significantly in both Tail (one-way ANOVA, $F=575.77$, $df=1,112$, $P<0.01$) and Wing Indices (one-way ANOVA, $F=514.33$, $df=1,112$, $P<0.01$). White-nest Swiftlets (Tail Index 4.3, Wing Index 9.8) may well be more manoeuvrable in flight than Black-nest Swiftlets (Tail Index 2.5, Wing Index 6.6). Hence it is possible that White-nest Swiftlets, morphologically better adapted to feeding at lower heights than Black-nest Swiftlets, may exploit a wider range of feeding niches, and are thus less affected than Black-nest Swiftlets by an increased nestling demand caused by artificial enlargement of the clutch.

In nature, however, few Black- or White-nest Swiftlets lay larger than usual clutches. A possible factor limiting clutch-size in both species is the shortage of energy or depletion of stored lipids which may be faced by females during egg formation (see Kang *et al.* 1991). In addition, despite the variety of potential feeding niches available to White-nest Swiftlets, the adults may usually not be able to feed more than two nestlings at a time, as in none of the artificially enlarged clutches did all the nestlings fledge. Therefore the White-nest Swiftlet's clutch of two may represent the compromise between producing more eggs but not having the resources to rear all nestlings to the fledging stage, and producing fewer eggs but losing the insurance against reproductive failure that is provided by laying more eggs. In contrast, the Black-nest Swiftlet's clutch of one may be one solution to the combined problems of not having the resources to rear more than one nestling to the fledging stage, and not benefitting from the insurance against reproductive failure that is provided by laying more eggs.

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Plumage variation and geographical distribution in the Kalij and Silver Pheasants

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The genus *Lophura* Fleming consists of ten species of fowl-like pheasants, commonly called gallo-pheasants. They are distributed along the Himalaya east of the Indus River to Bhutan and then on through Burma, Thailand, Laos, Cambodia and Vietnam to China (including Hainan) and also through Peninsular Malaysia to Sumatra and Borneo (Howard & Moore 1984, Sibley & Monroe 1990).

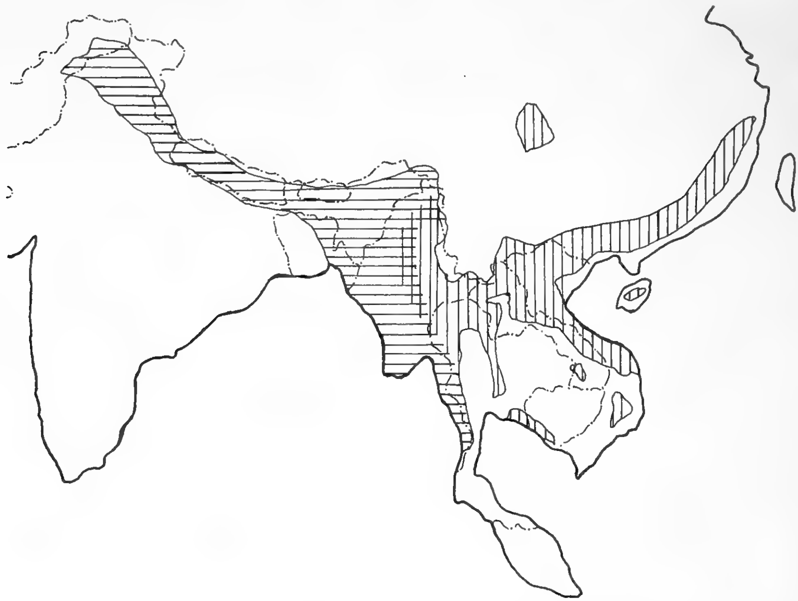

Figure 1. Map of South-east Asia with political boundaries (broken lines) to show the distribution of the Kalij Pheasant *Lophura leucomelanos* (area shaded by horizontal hatching to the left) and Silver Pheasant *L. nycthemera* (area shaded by vertical hatching to the right) according to Delacour. The River Irrawaddy and its western tributary, the Chindwin, are indicated near the junction of the two distributions (heavy lines). After Delacour (1977) and Johnsgard (1986).

In his review of the genus, Delacour (1949) suggested that two of the species, the Kalij Pheasant *L. leucomelanos** Latham and the Silver Pheasant *L. nycthemera* Linnaeus, form a superspecies within the genus *Lophura*. The Kalij Pheasant inhabits the forest and jungle of the Himalaya at moderate altitudes and is also found in the hilly regions of Burma and western Thailand. The Silver Pheasant is distributed throughout the mountains east of the River Irrawaddy, from Burma to Indochina, continental China and Hainan (Fig. 1).

Delacour (1949) listed 9 subspecies of Kalij Pheasant and 13 of Silver Pheasant, with hybrid zones between the two species occurring at several localities east of the Irrawaddy. Some of his subspecies had been described previously, often as distinct species; others Delacour proposed himself. All his subspecies were distinguished principally by differences in plumage, and were said to be geographically distinct.

Much of the earlier classification of pheasants had been based on specimens collected from isolated localities. As was often the case, the

*Sibley and Monroe (1990, p. 19) state that the correct spelling is *leucomelanos* rather than the more widely used *leucomelana*.

TABLE 1

Named subspecies of the Kalij Pheasant *L. leucomelanos* and Silver Pheasant *L. nycthemera* in the BM(NH) collections at Tring with the number of specimens examined and our assigned plumage categories

BM(NH) specimens labelled as:	Number of individuals	Plumage category
L. leucomelanos Latham		
hamiltoni J. E. Gray	22	1
leucomelanos Latham	7	1
melanota Hutton	12	2
lathami J. E. Gray	13	1
williamsi Oates	15	4
lathami/williamsi	17	3(7), 4(10)
oatesi Ogilvie-Grant	2	5
lineata Vigors	14	5
lineata/crawfurdi J. E. Gray	6	5
L. leucomelanos/L. nycthemera	20	3(1), 6(19)
L. nycthemera Linnaeus		
rufipes Oates	8	6
rufipes/occidentalis or *occidentalis* Delacour	7	6
ripponi Sharpe	5	6
ripponi (syn. *jonesi* Oates)	5	6
beaulieui Delacour	4	6
nycthemera Linnaeus	6	6
fohkiensis Delacour	7	6
engelbachi Delacour	2	6
beli Oustalet	1	6

description of trivial differences from type specimens had resulted in the erection of a multiplicity of new taxa. In his review, Delacour attempted a taxonomic reappraisal of the Kalij-Silver Pheasant complex, but some features of that reappraisal are at odds with the taxonomic and geographical data. In the present study geographical variation in the plumage pattern of the upperpart plumage of the male is investigated. It was primarily the male plumage that Delacour used to establish his taxa and hence indicate relationships. A clear picture of this variation across the geographical range of this complex will provide a realistic background for an analysis of relationships between birds from various localities.

Materials and methods

The present study was based on 173 specimens in the collection of the British Museum (Natural History)—now the Natural History Museum—at Tring. A list of these specimens labelled according to Delacour's system of subspecies, together with the number inspected in each subspecies and in each of our plumage categories, is given in Table 1.

The collections at Tring include at least one adult male specimen of each of the named subspecies of both *L. leucomelanos* and *L. nycthemera*, except for *L. l. moffitti, L. n. lewisi, L. n. annamensis, L. n. berliozi, L. n. whiteheadi*, plus the two recently named Chinese subspecies *L. n. omeiensis* and *L. n. rongjianensis*. Of these, *L. n. moffitti* is known only from several pairs shipped from Calcutta in 1934 (Delacour 1977) and a single male collected from Bhutan (Ali & Ripley 1984); *L. n. lewisi* and *L. n. annamensis* both occur at the southeastern limit of that species' range in southwestern Cambodia and southern Vietnam respectively; *L. n. berliozi* is "intermediate between *beaulieui* and *engelbachi* . . ." and occurs in central Vietnam and Laos, *L. n. whiteheadi* "resembles *nycthemera*" (Delacour 1949) and is from the island of Hainan. According to Tan & Wu (1981) "our new subspecies [*L. n. rongjiangensis*] resembles *L. n. beaulieui* and *L. n. nycthemera*".

The whole BM(NH) collection was inspected and a series of specimens (termed voucher specimens by Monroe & Browning 1992) from all the represented subspecies was laid out for direct comparison. A sample was chosen, representing all clearly distinguishable plumage patterns from both species. The reference sample was then used as a 'type series' to which most specimens having significant locality data were compared. In this study, as in other similar ones (e.g. Monroe & Browning 1992), direct comparison of specimens was essential, because published descriptions of colour and pattern are invariably inadequate.

In comparing specimens with the reference sample, each specimen was assigned to a reference pattern on the basis of its plumage. This assignment was added to the label data, *viz* locality, date, original taxonomic name and current subspecies.

Results

The reference sample consisted of 23 adult male plumage patterns (=reference patterns) and included at least one specimen from each named subspecies present at Tring, but where there was seen to be variation within a subspecies more than one specimen was included. The 23 patterns fell into six major categories, as follows:

(1) Feathers of the upper back blue/black to brown, those of the lower back and rump blue/black to brown with a broad white terminal band (Fig. 2).

(2) Back completely blue/black with no terminal band to rump feathers (Fig. 2).

(3) Feathers of the upper back blue/black, those of the lower back and rump blue/black with a broad white terminal band (i.e. as in category 1). Light spotting or vermiculation is evident on some feathers, particularly on the lower back and rump (Fig. 2).

(4) Feathers of the upper back blue/black, those of the lower back and rump blue/black with a broad white terminal band. All feathers have white markings which follow the contour of the feathers; the markings vary from disrupted vermiculations to unbroken wavy lines. Many feathers exhibit both extremes of marking, with relatively

Figure 2. Gallo-pheasants, back and rump in dorsal view to show plumage categories: (a) category 1, (b) category 2, (c) category 3, (d) category 5. Photographs by permission of the British Museum (Natural History).

broad white lines towards the base, hidden under overlying feathers (Fig. 3).

(5) Feathers of the lower back lacking the white terminal band. Black and white lines follow the contours of the feathers and become very disrupted on the visible part of the feather (i.e. that not hidden by overlying feathers). The lines are less than 1 mm wide, which, together with the disruption towards the feather tip, gives the impression from a distance of being grey (Fig. 2).

(6) Feathers with black and white V-shaped markings, which in virtually all cases are much broader at the base of the feather than at the top. The number and width of lines vary. There is some disruption towards the feather tip in some cases (Fig. 3).

The geographical distribution of each of these plumage categories is mapped in Figure 4.

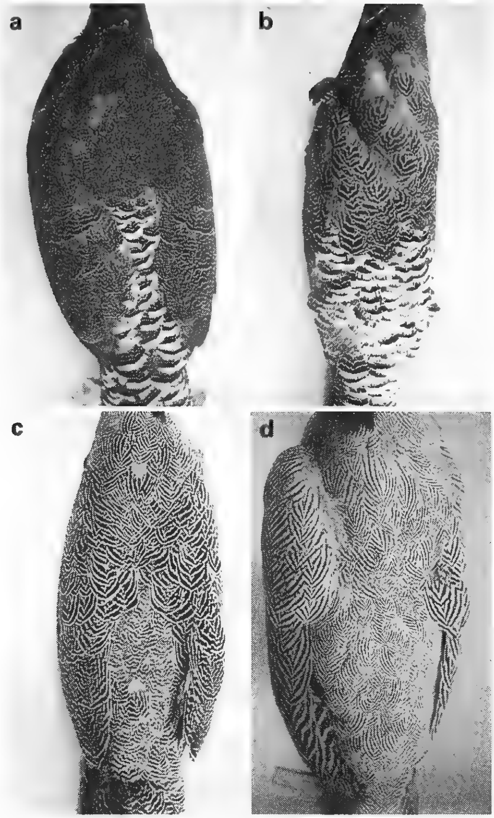

Figure 3. Gallo-pheasants, back and rump in dorsal view to show plumage categories: (a) and (b) extremes of category 4, (c) and (d) extremes of category 6. Photographs by permission of the British Museum (Natural History).

Variation within major categories

The overall distributions of the category 1 pattern is, judging from the Tring specimens, from Dharamsala in the northwest, through Simla (31°7′N, 77°9′E), the Kumaon Himalaya (29–31°N, 78–81°E) and Nepal (27–31°N, 80–88°E), disappearing in Sikkim (27–29°N, 88–89°E), then reappearing in Bhutan and Manipur in the Eastern Himalaya (to about 24–26°N, 92–95°E) (Fig. 4).

There is a limited amount of variation within category 1 throughout its recorded range. Birds to the west of Nepal (i.e. west of 80°E) have white shafts to the feathers, whereas those from Bhutan (91°E) eastwards have black shafts. Furthermore, the terminal band to the feathers decreases in width from Dharamsala (76°E) to those specimens labelled "Nepal" (80–88°E) (most specimens from Nepal are not

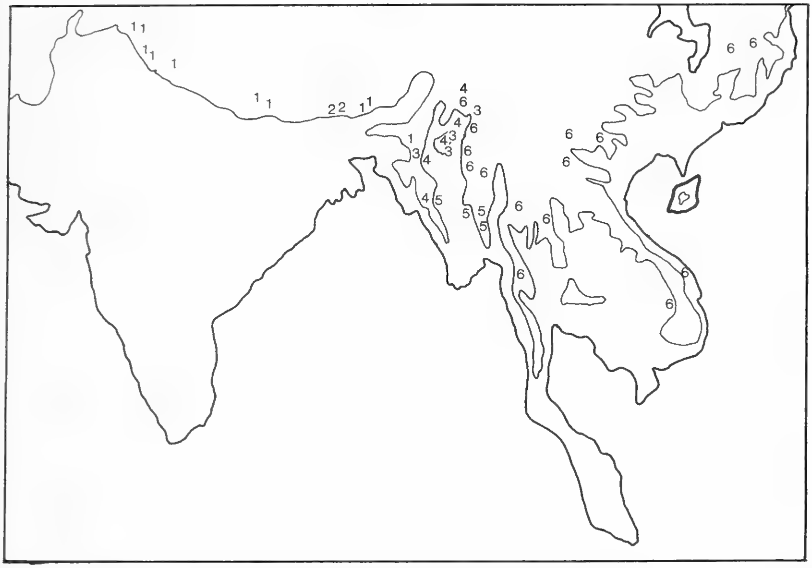

Figure 4. Map of South-east Asia showing localities from which our major plumage categories were recorded. Narrow line represents 1000 m contour.

further localised). Specimens labelled "Sikkim" (88–91°E—category 2) lack the white terminal band, but it reappears east of Sikkim. There is, however, no apparent trend in band width towards the eastern extremity of the category range.

There is little variation within category 2. Some specimens do, however, have a very narrow band of white (about 0.5 mm) in the position of the terminal band. Category 2 birds occur within the range of those within category 1 and are restricted to the Sikkim valley (27–28°N, 88–90°E) (Fig. 4).

Birds in category 3 are distributed from Tiddim in west-central Burma (23°23′N, 93°42′E) northeast to Saidon (Myitkyina District) in northeastern Burma (25°21′N, 97°54′E) (Fig. 4). They exhibit variation in both the extent of the white markings and also the distribution of these markings on the upper parts. From the limited sample there was, however, no evidence that patterns were arranged in a morphocline according to geographical position.

Birds in category 4 are distributed from the Arakan Hill Tracts of southwest Burma (about 21°30′N, 93°E to 21°N, 94°30′E) throughout northeast Upper Chindwin to Saidon in Upper Burma (25°21′N, 97°54′E). Most specimens, however, were recorded from the southwestern part of the range (Fig. 4). Category 4 birds vary quite considerably in the appearance of the lines on the feathers. In some specimens these lines are very disrupted, appearing almost spotted, whereas at the other extreme the lines are continuous throughout.

There is one exceptional specimen from Upper Chindwin in Burma which has four quite broad white lines per feather (reference pattern no. 10). Otherwise, the feathers have five to six narrow wavy lines. Again there is little correlation between feather pattern and geographical position.

Category 5 birds were recorded from east of the Irrawaddy in the Pegu Yomas (from Prome at 19°N, 95°E southwards) east to Chiang mai in Thailand (19°N, 99°E) and south to Tennasserim (14°N, 99°E) and Rahaeng (Tak). Within category 5, there is slight variation in the extent of the disruption of the lines on the feathers. In addition, the hidden portion of the feather varies in the clarity of the lines, with quite distinct broad lines in some specimens, but thinner and more wavy ones in others.

Category 6 birds are distributed from Myitkyina in Upper Burma (25°50′N, 97°30′E) in the north, south through the Shan States to Chaing Rai (19°56′N, 99°51′E), Na Noi (18°30′N, 100°30′E) and Pak Jong near Korat (15°N, 101°E) in Thailand. Eastwards, they occur through Xien-Khouang in Laos (19°21′N, 103°″23′E), Tonkin in northern Vietnam (23°N, 105°E to 22°N, 107°E) to Fukhien in China (24°N, 116° to 28°N, 117°E). There are some specimens from the Boloven Plateau in southern Laos (15°N, 107°E) and Hue in southern Vietnam (16°28′N, 107°35′E). The specimens collected in the west, close to the Irrawaddy, are darker, with more black on the feathers than those further east. The darkest birds recorded are from Mogok (Ruby Mines 23°N, 93°30′E) and Myitkyina District, but very similar specimens also come from the southeastern limit of the range at Boloven Plateau and at Hue. The feathers are black or brown, with 4 to 6 white Vs of 1-2 mm width. The Vs on the lower back and rump feathers are rather more disrupted than those on the upper back.

East of the Irrawaddy, there are also some category 6 birds which approach the birds of category 5 in appearance. These former have a marked degree of disruption of the lines towards the feather tip, although this is not so pronounced as in category 5. The category 6 specimens with the highest degree of disruption of the lines were, however, recorded from Saidon in Upper Burma. To the east of Burma, the black lines on the feathers become increasingly indistinct, so that the birds appear increasingly white (Fig. 3).

Geographical variation across major categories

The plumage patterns described above can be grouped into two major assemblages, consistent with the geographical distribution of the birds concerned. These assemblages are (1) the darker forms, usually with a white terminal band to the feathers of the lower back and rump (categories 1, 2, 3 and 4): all these may be assigned to *Lophura leucomelanos*, the Kalij Pheasant; (2) the generally lighter forms with a basic black and white V-pattern to the feathers and no white terminal band (categories 5 and 6): these may be assigned to

L. nycthemera, the Silver Pheasant. However, the two major plumage assemblages appear to be linked by specimens with feathers which have black and white V-shaped lines of equal width, the lines being more or less wavy, or slightly wider black lines (giving the appearance of white Vs on a black background). This feather pattern changes in three directions from the centre of the two species' aggregate range.

(a) To the west of the Irrawaddy River there is a cline of increasing disruption, and ultimately masking, of this pattern. All along the Himalaya the specimens are plain-backed and may or may not have a white terminal band to the feathers of the lower back and rump. Birds immediately to the west of the Irrawaddy (from Myitkyina southwest to Arakan Yomas) are at the southeastern end of this trend (category 4). Northwest of this area are found specimens which have the white markings as in category 4, but not distributed over the whole of the back or over the whole expanse of any given feather (category 3). These specimens are intermediate in appearance between category 4 and categories 1 and 2, which have no white markings other than the terminal band seen in category 1. Along the Himalaya, the plumage of the male upper parts varies but little, and is of category 1 type. The only exception is that of the completely dark-backed specimens from Sikkim, which are assigned to category 2.

To the east of the Irrawaddy two geographical trends are apparent.

(b) Moving southwards from the region of the Irrawaddy delta, the birds have an increasingly disrupted pattern and comprise our plumage category 5. The pattern of alternating black and white Vs becomes less distinct the further south the specimens occur.

(c) To the northeast of the Irrawaddy delta specimens are increasingly white, so that the whitest individuals occur in the extreme northeast. Traces of black are, however, never lost.

Taxonomic significance

North of the Chindwin River/Irrawaddy River junction, some members of the western assemblage extend to the east of the Chindwin, although these specimens are at a low frequency. However, much further north, around the Myitkyina District and not far from the source of the Irrawaddy, the major assemblages seem to intermingle freely. Nevertheless in Lower Burma, where the Irrawaddy forms a formidable barrier there is, apart from a single specimen attributable to the eastern assemblage which was recorded from west of the river in the Arakan Yomas, no evidence of either major assemblage spanning the river.

Thus, as we note above, it seems to us reasonable to assign all specimens from west of the lower Irrawaddy to *Lophura leucomelanos* (Kalij Pheasant) and all those from the east to *L. nycthemera* (Silver Pheasant).

In 1977 Delacour recognised nine Kalij subspecies and fourteen Silver subspecies. The additional Silver Pheasant subspecies described since then (Tan & Wu 1981) was added to the list by Johnsgard (1986).

The validity of many of these subspecies must remain in doubt, particularly if they are founded on pattern alone. Delacour states that there are six Kalij subspecies west of the Irrawaddy (*L. l. lathami, williamsi, moffitti, melanota, leucomelanos* and *hamiltoni*). All but *moffitti* are included in our study. In Burma there appears to be no relationship between plumage pattern and geographical position. Many of the specimens concerned were claimed to be *williamsi* or *lathami/williamsi* intergrades. Birds from Bhutan and Manipur are *lathami*: any "intergrades" with *williamsi* are probably better placed within our category 3. We therefore suggest that all category 4 specimens should be referred to *williamsi*, because the variation occurring within this category appears to be unrelated to geographical position. This does, however, restrict the area of distribution for *lathami* compared to Delacour's attributions.

Along the Himalayan range, there is little variation in the plumage of the back in adult males (apart from the distinctive *melanota* of Sikkim), but there are other variable characters, and Delacour uses these to differentiate subspecies. For example, *L. l. hamiltoni* and *L. l. leucomelanos* (the westernmost subspecies) are the only subspecies which have white breasts. In all other specimens of both species the breast is black. *hamiltoni* is then distinguished by its unique white crest; *L. l. leucomelanos* and all other specimens of both species have black crests. Our use of male upper parts would not separate *hamiltoni* and *leucomelanos* from one another or from *lathami*, but we concede that these other characters are sufficiently important, and probably consistent enough, to characterise all three.

Delacour suggested that the southernmost individuals to the east of the Irrawaddy, from Lower Burma and western Thailand southwards, belong to three subspecies of Kalij (*L. l. oatesi, lineata* and *crawfurdi*). Once again there is little difference between them. What there is, is perhaps related to geographical position. They comprise our plumage category 5 and the specimens we have investigated suggest that their pattern is derived from that seen in the Silver Pheasants further north, but east of the Irrawaddy.

The whitest specimens (all in our plumage category 6) of the Silver Pheasant are claimed to belong to seven subspecies (*L. n. rufipes, occidentalis, ripponi, beaulieui, nycthemera* and *fohkiensis*: specimens labelled "*ripponi* (syn. *jonesi*)" are from localities northeast of the localities of those simply labelled "*ripponi*"—we treat them as *jonesi*). Our sample size is small but nevertheless it suggests that variation is simply clinal, with the whitest forms in the extreme northeast.

The darker Silvers are intriguing. It is surprising that the individuals from the Boloven Plateau in southern Laos and the specimen from Hue in South Vietnam should resemble some individuals from Upper Burma so closely, particularly since individuals which inhabit the area in between exhibit such variation in plumage. Delacour assigned birds from the southeast to *L. n. engelbachi* (Boloven Plateau) or *beli* (Hue), but claimed that specimens from Upper Burma are Kalij/Silver hybrids. With the exception of one of the latter, all still fall within our plumage category 6.

Conclusions

Firstly we suggest that the most primitive plumage pattern occurs at the centre of the aggregate range of *Lophura leucomelanos* and *L. nycthemera* and that this pattern probably represents the ancestral (plesiomorph) condition for both species. In the Kalij Pheasant *L. leucomelanos* (to the west of the Irrawaddy River) this pattern has become disrupted and finally masked, leading to the plain-backed specimens of the Himalaya, which may or may not have a white terminal band to the feathers of the lower back and rump. In the Silver Pheasant *L. nycthemera* (to the east of the Irrawaddy) two geographical trends are apparent. Moving southwards from the region of the Irrawaddy delta, the birds have an increasingly disrupted pattern, whereas to the northeast they become increasingly white. Traces of black are, however, never lost.

If we have established that the Irrawaddy is an effective barrier between the two species, then the three subspecies *oatesi, lineata* and *crawfurdi* are Silver Pheasants, not Kalij Pheasants as maintained by Delacour, and are simply stages in a cline demonstrating increased disruption of the pattern southwards.

The seven white subspecies of *L. nycthemera* included in our study (*L. n. rufipes, occidentalis, ripponi, jonesi, beaulieui, nycthemera* and *fohkiensis*) appear to us to form another cline, which, on current evidence, does not merit separation into a series of distinct forms.

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Nesting records of *Pionus* species in southern Ecuador

by E. P. Toyne & M. T. Jeffcote

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The Blue-headed Parrot *Pionus menstruus* and Red-billed Parrot *Pionus sordidus* are both wide-ranging neotropical parrots (Forshaw 1989). In Ecuador *P. menstruus* is a common inhabitant of tropical forests up to 1100 m and is known throughout the entire east slope of the Andes, but on the west slope only as far south as Manabí, northern Guayas (R. Ridgely pers. comm.), with some records for El Oro province (C. Rahbek pers. comm.). In Ecuador *P. sordidus* is also found on both slopes of the Andes but occurs at higher altitudes than *P. menstruus* (Ridgely 1981). It is known from 1200 to 2300 m (R. Ridgely pers. comm.), but in Podocarpus National Park its range is between 950 and 2450 m (pers. obs., C. Rahbek pers. comm.). Within their respective ranges in the park both species can be described as fairly common.

Despite their wide ranges, there is limited information on their breeding biology. In this paper we summarise previous records and present information on the nesting of these species on the east slope of the Andes in Zamora-Chinchipe province in southern Ecuador. For a description of the study area see Toyne *et al.* (1992), and for an account of the area's avifauna see Bloch *et al.* (1991).

Blue-headed Parrot nest records

The Blue-headed Parrot breeds between January and April in Panama (Wetmore 1968, Willis & Eisenmann 1979), western Colombia (Hilty & Brown 1986) Venezuela (Cherrie 1916) and French Guiana (Dick *et al.* 1984); in October in Surinam (Haverschmidt 1968); and in both March and October in Trinidad (ffrench 1992). Paul Roth (in Forshaw 1989) documents its nesting in northern Brazil during late April through to September, with late nesting or re-nesting occurring in December. On one occasion the previous nest of a White-eyed Parakeet *Aratinga leucophthalmus* was used in the same year. In captivity clutches are of two or three eggs (Ingels 1978).

Our nest was found by José Fernando Villa at Serranía (*c.* 04°02′S, 79°00′W) at 1400 m on 28 March 1992, when it contained two newly hatched nestlings (no feather development, closed eyes). This location is between El Limón and Sabanilla (IGM 1981) on the edge of the Loja-Zamora road, 4 km north of the Podocarpus National Park boundary. The record extends the known elevational range of this species by 300 m, from around 1100 m to 1400 m. On 2 May, when EPT visited the nest-site, one adult *P. menstruus* was observed circling the site, constantly calling and occasionally settling on adjacent tree tops. On inspection, the nest was empty; it was subsequently discovered that it had been robbed by the local farmer the day before. The farmer had cut the trunk to form steps up to the nest in the previous year when he also robbed the nest, which was an old woodpecker's hole in the trunk of a dead *Cordia alliodora* tree (Boraginaceae). The limbless tree was 12 m tall, and the nest hole was 4 m from the ground and faced west. The tree's diameter at nest height was 11 cm and at breast height 18 cm. The diameter of the circular nest entrance was 18 cm and the nest depth approximately 45 cm. The nest was lined with wood shavings and some pale blue egg-shell remains were visible. The nest tree was situated on a north-facing slope in the middle of a grassy, cattle-grazed clearing. The nearest neighbouring tree was 5 m away and tree density in the field was low, approximately 75 per hectare; all these were mature trees. The stumps of felled trees covered the field. Tall mature trees grew on the banks of a river 40 m away, and the forest-edge was approximately 400 m upslope of the nest site.

The two nestlings (one male and one female; Rodrigo Tapia pers. comm.) were found, on the same day, at the nearest farm. In captivity they had been fed on maize so their weights (♀260, ♂315 g) and other biometrics (body length ♀200, ♂215; tarsus ♀25.4, ♂25.3; wing ♂110; tail ♂50 mm (♀ wing and tail cut) were not totally natural. When questioned the farmer said that a pair of Blue-headed Parrots had used the same nest last year and produced one nestling, which he took and sold in Loja. This year's nestlings would each be sold for approximately $8 at the local town of either Loja or Zamora.

Breeding dates can be estimated from the approximate age of the nestlings. Using Ingels' (1978) data on incubation (24–29 days) and fledging periods (55–60 days), we estimate the laying date to be within the range 27 February to 3 March, with the young (if undisturbed) leaving the nest around 22–27 May.

Red-billed Parrot nest records

The Red-billed Parrot nests in April, at the end of the dry season, in north-central Venezuela (Schäfer & Phelps, 1954, Forshaw 1989). In Colombia a male was taken from a nesting hollow in April and birds in breeding condition have been collected from February to April (Hilty & Brown 1986). Near La Paz in northern Bolivia an occupied nest was found in October in the hollow trunk of a tree, approximately 6 m from the ground (Niethammer 1953, Forshaw 1989). Breeding has been recorded in captivity when a clutch of three was laid and the young fledged when twelve weeks old (Stoodley 1978).

Our nest was found by MTJ on 3 May 1992 on the east slopes of the Cordillera de Curintza (*c.* 04°08′S, 78°57′W) at an altitude of 1600 m. This location is within the boundary of Podocarpus National Park. The nest was in a hollow in a 4 m tall, unidentifiable dead and rotten tree stump (Toyne 1993). The entrance to the nest was on the top of the stump and was 10 cm wide. The hole gradually widened down to the nest, and was approximately 1.5 m deep. This depth made removal of the three nestlings virtually impossible, and it was not attempted. The tree diameter at breast height was 20 cm.

The nest tree was located in a forest clearing of approximately 7 ha that was used for cattle-grazing. It was quite exposed, with only a few other trees or dead stumps in the clearing and was 40 m from the nearest cover, which was mature forest growing along the *quebrada* below the nest-site. There was also forest 200 m upslope of the nest tree. Despite the site's open aspect the presence of the nest was far from obvious, as although the adults were conspicuous around the nest-site, they visited the nest secretively, without calling.

The nestlings were not examined in the hand and only viewed from the nest entrance with a torch. They appeared to be well developed and slightly smaller than the adult birds. Using both Ingels' (1978) and Stoodley's (1978) records of successful captive breeding of *Pionus* species, the breeding dates at Curintza can be estimated. At nest inspection the primary feathers were well developed and the nestlings were an estimated 10 days from fledging, suggesting they were between 10 and 11 weeks old. Assuming an incubation period of 27 days and a 6–7 day laying period, laying would have started around 16 January. Hatching was probably in the range 15–22 February, with the young fledging 11–17 May.

Discussion

The fact that both nests were found in heavily degraded habitat with very exposed aspects suggests that both species are adaptable in their nesting habitat requirements, being able to utilise exposed nest holes through either preference or necessity. Alternatively, it might be that these were both traditional nest sites used before the forest was felled and our nest records indicate the birds' loyalty to them.

The Blue-headed Parrot is thought to be unusually adaptable in its habitat requirements (Ridgely 1981), and our observations support this. The species' ability to exist in degraded habitat may be one reason for its being one of the most numerous neotropical parrots (Ridgely 1981). The Red-Billed Parrot has also been reported to exist in areas of disturbed habitat, as in our case, but in Venezuela deforestation has brought local declines (Forshaw 1989). It is not known whether it has declined in Ecuador.

Although the breeding dates for the two nests are estimates, the Red-billed Parrot certainly bred earlier than the Blue-headed Parrot; but clearly one cannot draw general conclusions from these single cases.

Acknowledgements

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IN BRIEF

FIRST RECORD OF WHITE-WINGED NIGHTJAR *CAPRIMULGUS CANDICANS* FOR BOLIVIA

A specimen of *Caprimulgus candicans* was collected on 11 September 1987, in Dpto. Beni, Prov. Yucuma, Bolivia, at the Estación Biológica del Beni (EBB) (14°38′S, 66°18′W), 210 m. It was captured by hand, during daylight hours, in dry open savanna near Estancia El Provenir, by a guide accompanying E. Flores. The specimen (Colección Boliviana de Fauna, 0624) is a ♂ (left testis 6 × 3.5 mm, right 6 × 2 mm) with no fat and skull 95% pneumaticized. It is similar in size and appearance to previously published descriptions (Sclater 1866, *Proc. Zool. Soc. London*: 581–590; Hartert 1892, *Catalogue*

Birds Brit. Mus. XVI): wing 133 mm (5.25 in); tail 95 mm (3.75 in); larger wing-coverts and inner secondaries white; primaries black, white at base; third primary (from outside) longest; abdomen, under wing coverts, outer rectrices (all but central pair in this specimen) white. The specimen differs from published descriptions (Slater, *loc. cit*; Hartert, *loc. cit.*) in lacking ochraceous wash above and ferruginous spots on scapulars; throat, sides of neck, and breast are not chestnut, but brown spotted with buff; and rectrices are edged brown rather than buff.

This rare nightjar is known from a few localities in central and southern Brazil, with an unconfirmed record from Paraguay: Cuiabá, Mato Grosso, mid-1820s; Emas National Park, Goiás, 1980s–1990s; Orissanga, São Paulo, 1823; and an unknown locality in Paraguay, 1700s (Collar *et al.* 1992, *Threatened Birds of the Americas*),. Two specimens at Field Museum of Natural History tentatively identified as *C. candicans* (Collar *et al., loc. cit.*) are in fact ♀ *Eleothreptus anomalus* (D. Stotz pers. comm.).

The only previously known locality for the species from this century is Emas National Park, where it has been recorded from open grassland habitats; the population is believed to number in the hundreds (Collar *et al., loc-cit.*). Appropriate habitat is extremely limited in west-central Brazil and *C. candicans* is seriously threatened by the destruction of its remaining habitat (Collar *et al., loc-cit.*).

The Beni record represent a major western range extension of approximately 1500 km, and the morphological differences of the specimen may indicate an undescribed form of *C. candicans*. Previous efforts to survey the avifauna of the EBB have been relatively brief and did not concentrate on nocturnal species. Furthermore, identification of *C. candicans* in surveys of appropriate habitat is hindered because its vocalizations are unknown (Collar *et al., loc-cit.*). A serious effort should be made to determine if there are viable populations of *C. candicans* in Bolivia.

We thank Doug A. Stotz for confirming the identification of the specimen. We acknowledge Jaime Sarmiento and Omar Rocha, of the Museo Nacional de Historia Natural, La Paz, for access to the Colección Boliviana de Fauna.

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18 May 1993

FIRST RECORD OF THE DUNLIN FROM THE PHILIPPINES

The Dunlin *Calidris alpina* is a rare vagrant to New Zealand (Falla *et al.* 1981, Hayman *et al.* 1988), Australia (Simpson & Day 1984, Hayman *et al.* 1988), Timor (doubtful) (White & Bruce 1986), Hawaii, Palau, Marianas, Pohnpei and Wake (Pratt *et al.* 1987). It is a common winter visitor in Japan (Wild Bird Society of Japan 1983), and winters also in southeastern China (Mayer de Schauensee 1984). From the Philippines only one record of the Dunlin has been reported so far, a skin from Palawan (McClure & Leelavit 1972); but recently it was re-identified as a Curlew Sandpiper *Calidris ferruginea* (Dickinson *et al.* 1991).

On 1 March 1988, Peter Sunesen and Ulla Rydmann found a dead Dunlin on a tidal flat near Aparri on the north coast of the island of Luzon. The bird was intact and not decomposed; its weight was 61 g. The preserved skin is now in Taps Old Rectory #4979, ♀ ad, ovary 5.1 mm × 2.9 mm, oviduct sinuous and 1.4 mm wide. Its stomach contained only a small amount of grit and residues of gastropod shells. Some body feathers were in moult. It was generally in winter plumage, in appearance like number j on plate 84 in Hayman *et al.* (1988) except for no reddish-brown on the upperparts, more distinct streaking on the lower neck and upper breast, and a few blackish feathers on the lower breast. Its measurements were: exposed culmen 36.9 mm, wing (chord flattened) 117.3 mm, femur 23.0 mm, humerus 30.9 . From the measurements it is not possible to come to any conclusion about the race of this specimen (MacLean & Holmes 1971, Greenwood 1986, Browning 1991).

I am sincerely grateful to Mr Peter Sunesen, Copenhagen, who gave me the frozen Dunlin and permitted me to publish this first record for the Philippines. I should also like to acknowledge Dr Kenneth C. Parkes and Dr Anders Pape Møller for reading through and making valuable comments on the draft.

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JOHANNES ERRITZOE

12 June 1993

BLACK-NAPED TERN *STERNA SUMATRANA* IN MADAGASCAR

The Black-naped *Sterna sumatrana* breeds from Aldabra atoll in the western Indian ocean to Samoa in the Pacific (Harrison 1983). In the western half of the Indian Ocean, it has bred on several islands in the Seychelles archipelago, including Aldabra (up to 70 pairs, the largest concentration in the Seychelles) and Farquhar (Feare 1984, Stoddart 1984). There are approximately ten records from the African mainland, mostly cyclone-blown individuals on the coast of the Mozambique channel, in the period January–April (Ginn *et al.* 1989). There are no published records of the species from either Madagascar or the Comoro islands (*contra* Harrison 1983; Louette 1988, Langrand 1990) although Louette (1988) speculates that they must occur as they breed as close to the Comores as Aldabra, and Langrand (1990) included the species as one that was likely to occur.

With this in mind it is perhaps fitting that I observed a single adult Black-naped Tern at Sedradroa, 10 km north of Maroalika, Mahajanga province, Madagascar (45°10′E, 15°58′S) on 4 February 1993. It was with a group of other terns including Lesser-crested Terns *Sterna bengalensis*, roosting on the beach, where I observed it at a range of 10 m. A few days earlier, a tropical depression had passed the region from the north; it seems likely that the Black-naped Tern had been blown in on the accompanying winds. The bird was highly distinctive, being of medium size (for a tern; about the same size or slightly smaller than a Common Tern *Sterna hirundo*) and completely white save a pale grey wash over the mantle and wings, a very pale pink wash on the breast and a black line from the bill around the back of the neck.

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22 June 1993

AGAIN: THE ENGLISH NAME OF *GALLICOLUMBA STAIRII*

The English name of the ground-dove *Gallicolumba stairii* has been discussed controversially, whenever it has been mentioned in recent times. Even authors, who probably have never seen this bird in the wild, feel obliged to comment on the assumed inappropriateness of its name (cf. Bailey 1992, *Bull. Brit. Orn. Cl.* 112: 275–276).

Gallicolumba stairii apparently is a shy and wary species, wherever recent authors, and these are not many, have seen these birds. The locations were usually remote areas of inhabited islands which are infested with cats and, in case of the large Fiji islands, with mongooses.

My studies in Tonga, and the distribution pattern of ground-doves in French Polynesia, provide clear evidence that ground-doves and introduced mammalian predators, including humans, do not coexist on any island. All three species (*G. stairii, G. erythroptera* and *G. rubescens*) are now restricted to very few islands. And these refuges of ground-doves in Polynesia have been visited by few biologists.

Thus, it has escaped the attention of the ornithological community that *G. stairii* in its natural state is extraordinarily abundant, and an extremely confiding, a truly friendly species (Rinke 1991, *Notornis* 38: 151–171). I had similar experiences with the species on all the other islands in Tonga where it has survived (Rinke, in prep.).

Its timidity on inhabited islands is just an observer's impression when experiencing the difficulties of locating the species, which survives in low numbers only in the remotest areas on such islands. Its true nature, which it shows in a "friendly environment", is friendliness. And this is the main reason why it has been hunted to extinction on so many islands, either by humans or by introduced predators.

I propose that the name "Friendly Ground-dove" should be retained, because this name is very descriptive, it refers to the origin of the type specimen of the species, and it has been widely used in the literature. The proposed name "Shy Ground-dove" would only create confusion, apart from its inappropriateness.

Brehm Fund South Seas Expedition, DIETER R. RINKE
Private Bag 52,
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Kingdom of Tonga. 24 June 1993

OBSERVATIONS AT A NEST OF THE PACIFIC ROYAL FLYCATCHER *ONYCHORHYNCHUS CORONATUS OCCIDENTALIS*

The Royal Flycatcher *Onychorhynchus coronatus* is a widely distributed species found from Mexico to Bolivia. The isolated, subspecifically distinct population found on the Pacific side of Ecuador and immediately adjacent northwestern Peru was originally described as a distinct species, *Onychorhynchus occidentalis* Sclater, 1860. It is known from only a few localities, in low-lying humid forest. During survey work carried out in January 1992 around the village of San Miguel del Azuay (*c.* 2°48'S, 79°30'W) on the Pacific slope of Azuay province, Ecuador, a pair of Royal Flycatchers was observed displaying and nest-building. What follows appears to represent the first documented description of the nest of *O. c. occidentalis*. The sighting itself is also significant, being the highest altitude (*c.* 900 m) at which this species has been recorded, and the first documented record for the province (published in outline in Collar *et al.* 1992, *Threatened Birds of the Americas*).

The birds were observed for aproximately one hour, displaying and continuing to build a half-constructed nest. The nest was roughly 200 m from the edge of the village of San Miguel del Azuay, overhanging a small stream on the edge of primary forest, only 30 m from a regular crossing place used by local villagers. It was suspended 5 m above the water from the outer branches of a 20–25 m tall tree, being easily visible and unprotected by any vegetation. The nest itself was about 1 m long and made of loosely interwoven twigs (mostly 10–20 cm long), giving it an untidy appearance. The side etrance was only partially constructed. The nest and its site were typical of the species (Hilty & Brown 1986, *A Guide to the Birds of Colombia*). The only nest of the species which I have seen elsewhere (*O. c. coronatus* in Mexico 1991) was also in an open position and unprotected by vegetation.

During the hour-long observations, the female spent most of the time sitting in the nest, weaving new twigs into the structure. Occasionally she left the nest for a few minutes, returning with more twigs. The male was not observed helping with nest-building, but on several occasions was observed displaying to her. He would fly towards and around her, occasionally raising and lowering his crest, and sometimes hovering for very short periods in front of her. He would then return to perch on a nearby branch. Each period of display lasted for less than 30 seconds.

The area surrounding San Miguel del Azuay was surveyed for a week but only one pair of Royal Flycatchers was encountered. The subspecies is rare at other known sites (Collar *et al.*, *loc. cit.*), suggesting it is a low-density species. The low-lying humid forest to which it is confined now exists only in small isolated patches. *O. c. occidentalis* is therefore given the classification "Endangered" in the Red Data Book for the Americas (Collar *et al.* 1992, *loc. cit.*).

This discovery would not have been possible without funding for the survey work which came principally from Birdlife International, the British Ecological Society, the University of East Anglia and the Royal Geographical Society. Many thanks for helpful comments on this paper from Dr Robert Ridgely, Dr Nigel Collar, David Wege and Brinley Best.

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M. J. WHITTINGHAM

7 July 1993

MEASUREMENTS OF *DIOMEDEA EXULANS ANTIPODENSIS* AND *D. E. GIBSONI*

The detailed standard measurements supporting the erection of these two subspecies of the Wandering Albatross (Robertson & Warham 1992. *Bull. Brit. Orn. Cl.* 112: 74–81) were deliberately omitted from that paper as they were due to be published in a more general paper on the Wandering Albatrosses of Australia and New Zealand. Due to the

TABLE 1

Standard measurements of Wandering Albatrosses from New Zealand breeding locations. (Refer to annotations in Notes)

Note	Sex	Culmen length	Wing	Tail	Tarsus	Mid-toe & Claw	Weight (kg)
DISAPPOINTMENT ISLAND (AUCKLAND IS.)							
a.	M	153.2 ± 3.66 [15]	673 ± 2.90 [3]	195 ± 5.00 [3]	119.1 ± 5.31 [3]	166.0 ± 8.19 [3]	7.37 ± 1.36 [3]
a.	F	146.7 ± 4.75 [13]	638 ± 12.60 [4]	187 ± 3.56 [4]	110.6 ± 4.06 [4]	157.2 ± 2.63 [4]	5.45 ± 0.73 [4]
ADAMS ISLAND (AUCKLAND IS.)							
b.	M&F	145.8 ± 4.96 [16]	645 ± 11.00 [16]		115.7 ± 4.25 [16]	162.0 ± 5.32 [16]	
c.	M	150.7 ± 3.36 [13]	660 ± 10.90 [11]	200 ± 6.56 [13]	116.6 ± 2.26 [13]	165.4 ± 4.42 [13]	6.65 ± 0.60 [13]
c.	F	146.4 ± 4.16 [13]	640 ± 12.20 [11]	193 ± 6.30 [13]	111.5 ± 2.16 [13]	157.2 ± 3.90 [13]	5.53 ± 0.39 [11]
CAMPBELL ISLAND							
d.	M&F	145.5 ± 5.46 [5]	645 ± 15.80 [4]	189 ± 7.42 [5]	112.7 ± 4.11 [4]		
e.	M&F	152.3 ± 5.17 [9]	657 ± 12.30 [9]	194 ± 4.90 [9]			7.72 ± 0.61 [8]
f.	M	150.4 ± 4.21 [8]	667 ± 15.70 [5]	207 ± 3.49 [5]	118.0 ± 3.66 [5]	167.5 ± 3.71 [5]	6.88 ± 0.53 [2]
f.	F	144.7 ± 2.91 [11]	650 ± 11.80 [6]	197 ± 5.85 [6]	113.0 ± 2.90 [6]	157.5 ± 3.70 [6]	5.70 ± 0.62 [3]
ANTIPODES ISLAND							
g.	M&F	146.0 ± 6.64 [9]	657 ± 9.80 [5]	193 ± 6.48 [9]	113.6 ± 5.08 [9]		
h.	M	148.1 ± 2.48 [8]	655 ± 18.10 [8]	203 ± 3.04 [8]	116.6 ± 3.46 [8]	176.6 ± 2.50 [8]	7.36 ± 0.80 [8]
h.	F	138.0 ± 4.98 [6]	625 ± 6.10 [5]	199 ± 6.69 [6]	108.7 ± 3.14 [6]	167.0 ± 7.67 [6]	5.67 ± 1.03 [6]
i.	M	151.0 ± 4.13 [54]	664 ± 7.80 [10]	191 ± 6.30 [10]	119.7 ± 3.10 [10]	167.2 ± 2.62 [10]	7.46 ± 0.84 [10]
i.	F	143.1 ± 3.97 [60]	643 ± 8.80 [15]	190 ± 7.43 [15]	113.4 ± 2.17 [15]	159.3 ± 4.11 [15]	5.84 ± 0.45 [15]

delay of this publication it seems prudent to present the material, identifiable to the breeding locations of these taxa referred to in Robertson & Warham (1992), in its own right.

Because the measurements, from both live birds and museum specimens, have been provided by a number of persons these are recorded separately and annotated with the type of specimen in the following notes which accompany Table 1. The authors wish to thank and acknowledge those persons other than themselves who provided material for this compilation.

NOTES. All measurements are in millimetres or kilogrammes as means ± 1 S.D.; sample sizes are in square brackets. (a) live birds measured by C. J. R. Robertson (CJRR). (b) live birds measured by B. D. Bell, R. Russ and CJRR. (c) live birds measured by CJRR. (d) skins measured by CJRR (Vienna, British Museum (BMNH), National Museum of NZ (NMNZ)). (e) live birds measured by various Campbell Is. meteorological station staff. (f) live birds measured by CJRR. (g) skins measured by CJRR (Vienna, BMNH, American Museum of Natural History, NMNZ). (h) live birds measured by John Warham. (i) live birds measured by CJRR.

Science & Research Division, Dept. of Conservation, P.O. Box 10-420, Wellington, New Zealand. — C. J. R. ROBERTSON

Zoology Dept., University of Canterbury, Christchurch 1, New Zealand. — JOHN WARHAM

15 November 1993

BOOKS RECEIVED

Madge, S. & Burn, H. (no date) *Crows and Jays: a guide to the crows, jays and magpies of the world*. Pp. xxiii+191. 30 colour plates, distribution maps, text-figs. Christopher Helm/A. & C. Black. ISBN 0-7136-3999-7. £25.95. 24 × 16 cm.

An excellent addition to the recent series of guides to bird families, covering what most ornithologists regard as the Corvidae but which is here treated as the tribe Corvini, with strange tribal bedfellows such as wood-swallows and Old World orioles, within the subfamily Corvinae, in a vastly expanded family Corvidae. This premature acceptance of Sibley's revolutionary reclassification, which will surely be subject to modification in the future, does not detract from a very sound text, the greater part of which consists of a systematic section with species dealt with under standard headings, accompanied by distribution maps of all species and an outstanding series of colour plates by Hilary Burn, far the best—and the only comprehensive—collection of illustrations of the Corvidae within the covers of a single book.

Clement, P., Harris, A. & Davis, J. 1993. *Finches & Sparrows: an identification guide*. Pp. ix+500. 73 colour plates, maps, text-figs. Christopher Helm/A. & C. Black. ISBN 0-7136-8017-2. £29.99. 24 × 16 cm.

Yet another good guide to a section of the world's birds, comprising (in conventional classification) the Fringillidae, Estrildidae and Passeridae. Similar in lay-out to *Crows and Jays*, the colour plates are placed together in a block before the main text, and have on the facing page distribution maps of the species illustrated, brief statements of the range, and diagnostic plumage characters. The systematic text is subdivided into standard sections and accompanied, where helpful, with black-and-white drawings aiding identification. In spite of the subtitle this book is more than an identification guide, as there is a mass of condensed information on the species' natural history. The colour plates, by Alan Harris and John Davis, are excellent.

Gosler, A. 1993. *The Great Tit*. Pp. 128, numerous illustrations in colour and black-and-white. Hamlyn. ISBN 0-600-57950-6. £9.99. 21 × 14 cm.

It may be invidious to select for review one of the (to date) six books that have appeared in the series of 'Hamlyn species guides', all of which are good; but Andy Gosler's book is very good indeed, partly because it is clearly and engagingly written, partly because so many interesting and biologically significant things can be said about the best studied bird in the world. In deciding on 128-page books (as they all are) with abundant illustrations, the publishers (series editor, David Christie) have, it seems, got it exactly right. Much longer species monographs, with full statistical data, must appeal mainly to the more academic ornithologists engaged in research on the biology of the same or related species; much shorter books are in danger of being unsatisfactorily superficial. These species guides give everything that non-specialist readers will want to know, with references for those who may wish to pursue matters further. The other four in the series so far are: *The Common Tern*, by R. Hume; *The Fieldfare*, by D. Norman; *The Barn Owl*, by C. Shawyer; *The Kestrel*, by M. Shrubb; *The Swallow*, by A. K. Turner.

Erritzoe, J. 1993. *The Birds of CITES and How to Identify Them*. Pp. xxii+199, 85 colour plates, text-figures, map. Lutterworth Press. ISBN 0-7188-28917. £30.00. 30 × 21 cm.

For anyone concerned with the Convention on International Trade in Endangered Species (CITES), who has not got easy access to a comprehensive ornithological library, this will be an essential work of reference. Johannes Erritzoe and his wife Helga Boullet Erritzoe have illustrated in colour all the 406 bird species listed in the CITES appendices, and the accompanying text gives concise descriptions; plates and text together should make it possible for anyone, however inexpert, to make correct identifications. Appendices include the text of CITES, and a glossary of technical and other relevant terms in English, French, German and Spanish. For those seeking further information on any species there is a reference list of 432 publications.

This book is produced in a hardback and a ringbound edition. It is available direct from the Lutterworth Press (hardback £30, ringbound £26), P.O. Box 60, Cambridge CB1 2NT. It is intended that supplements will be issued every two years so that the ringbound edition can be updated.

We have been sent the following review of a book which, though not received by us, should be of interest to many of our members.

Ralph, R. 1993. William MacGillivray. Pp. 95, 32 colour plates, 37 black-and-white illustrations. London: HMSO (Natural History Museum). ISBN 0-11-310043-4. £25.

I was an undergraduate of Aberdeen University Zoology Department yet was ignorant of the former Regius Professor, William MacGillivray, until advised by Ratcliffe (*The Cairngorms*, Nethersole-Thompson & Watson 1974, p. 75) to read *The Natural History of Dee Side and Braemar*. MacGillivray completed that work almost one and a half centuries ago yet it remains inspirational, his field experiences seeming as fresh today as then. I was impressed by three aspects. Firstly, that much of MacGillivray's broad-based knowledge was 'first-hand', and he viewed organisms as interacting within the environment—he was a field ecologist. Secondly, that his descriptions are remarkably accurate; so accurate that the reader, confronted with the rocks of the Grampians, can retrace MacGillivray's route, making similar observations and, on mountain ledges, probably seeing the same plants. Thirdly, that he was highly motivated, worked very hard and enjoyed a long walk.

Now that I have read Robert Ralph's book, I am substantially more impressed with MacGillivray's achievements. The book draws together much, if not all, of what is known of him. It is quite short and very easy to read, the story so intriguing that I read most of it at one go. Ralph's text skilfully interweaves the biography with quotation and example, so the book contains plenty of MacGillivray's work. The text includes some lengthy quotations from his writings and is well illustrated with his black-and-white sketches and plates. There is a bibliography of his publications and 32 colour plates of a selection of watercolour paintings, most of them previously unpublished. MacGillivray was an excellent artist, the accuracy of posture and detail in his studies a further testimony to his combined field and laboratory skills. Ralph lists Plate XX as 'Goldsinny wrasse, *Ctenolabrus rupestris* (*Labrus* of MacGillivray)', yet the head shape and lack of dorsal fin spot suggest it is a brown Ballan wrasse *Labrus bergylta*. A count of the dorsal fin rays and the scales along the lateral line confirms MacGillivray's *Labrus* identification, and demonstrates his attention to detail. This was the only 'error' I could find in the book.

One striking aspect stems from the book's vivid portrayal of science in the mid 19th century, which inevitably demands comparison with today. The accurate works of MacGillivray depict familiar scenes; the plants and animals are as we might see them now. Ralph's text tells of acrimony within the politics of science, the human frailties, the interaction of personalities that dominated the academic scene then, ultimately to MacGillivray's disadvantage. Such scenes are likewise not uncommon now. In contrast the lifestyles of scientists and the equipment at their disposal have changed dramatically. There is no doubt that over the last 150 years there have been huge advances in the understanding of ecological pattern and process, but much of the backdrop evidently remains the same.

I strongly recommend this book; it is a good read, enjoyable and thought provoking. Ralph aspires to kindle popular interest in William MacGillivray. I think with this book he may well do so. I, for one, will take the bibliography and avidly explore further.

MICK MARQUISS

NOTICE TO CONTRIBUTORS

Papers, from Club Members or non-members, should be sent to the Editor, Dr D. W. Snow, The Old Forge, Wingrave, Aylesbury, Bucks HP22 4PD, U.K., and must be offered solely to the *Bulletin*. They should be typed on one side of the paper, with **treble**-spacing and a wide margin, and submitted in duplicate. The style and lay-out should conform with usage in this or recent issues of the *Bulletin*.

A contributor is entitled to 10 free offprints of the pages of the *Bulletin* in which his contribution, if one page or more in length, appears. Additional offprints or offprints of contributions of less than one page may be ordered when the manuscript is submitted and will be charged for. Authors may be charged for proof corrections for which they are responsible.

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CORRESPONDENCE

Correspondence about Club Meetings and on all other matters should go to the Hon. Secretary, Mrs A. M. Moore, 1 Uppingham Road, Oakham, Rutland LE15 6JB, U.K.

CONTENTS

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Bulletin of the

British Ornithologists' Club

Edited by
Dr D. W. SNOW

Volume 114 No. 3 September 1994

FORTHCOMING MEETINGS

Tuesday, 4 October 1994. Mr Tom Gullick will introduce **Mr Rafael Hiraldo,** who will speak on **Lammergeier in the Pyrenees—Past, Present and Future.** Since 1970 Rafael Heredia has been monitoring Lammergeier in the Pyrenees. This work began as a personal venture, subsequently backed by WWF, the Belgium Institute for the Protection of Raptors, and now funded by the Spanish Government Conservation Agency.

Members wishing to attend are asked to notify the Hon. Secretary by Tuesday, 20 September 1994.*

Tuesday, 8 November 1994. The Vice-Chairman, The Reverend Tom Gladwin, is the speaker. His talk has the title "Appalachian Journeys", in which he describes the natural history of the Appalachian Mountains in all seasons. Mr Gladwin is a wildlife consultant who has travelled extensively in North America. He was closely associated with the setting up of the Hertfordshire Trust for Nature Conservation.

Members wishing to attend are asked to notify the Hon. Secretary by Tuesday, 25 October 1994.*

Tuesday, 6 December 1994. Mr Michael Walters will speak on **"The History of Ornithology".** Mr Walters has been at The Natural History Museum, at Tring, for the past 20 years. He is one of the Curators of the Bird Group and has particular responsibility for the Egg and Type Collections. He has published many papers on divers taxonomic and egg issues.

Members wishing to attend are asked to notify the Hon. Secretary by Tuesday, 22 November 1994.*

Tuesday, 17 January 1995. Dr David T. Parkin will speak on **"Recent Developments in the Forensic Investigation of Birds of Prey".**

Tuesday, 21 March 1995. Dr Ian Newton F.R.S. will speak on **"The Year of the Sparrowhawk".**

Meetings are held in the Sherfield Building of Imperial College, South Kensington, London at 6.15 p.m. for 7 p.m. A map showing Imperial College will be sent to members on request.

Overseas Members visiting Britain are particularly welcome at meetings—details of which can be obtained from the Hon. Secretary, 1 Uppingham Road, Oakham, Rutland LE15 6JB. Telephone (0572) 722788.

*Late acceptances and cancellations can usually be taken up to the weekend preceding a meeting, although members are asked to accept by 14 days beforehand as arrangements for meetings have to be confirmed with Imperial College well in advance.

Bulletin of the
BRITISH ORNITHOLOGISTS' CLUB

Vol. 114 No. 3 Published: 30 September 1994

ANNUAL GENERAL MEETING

The Annual General Meeting of the British Ornithologists' Club was held in the Ante-room of the Sherfield Building, Imperial College, London SW7 on Tuesday 24 May 1994 at 6 p.m. Mr D. Griffin was in the Chair. 16 members were present.

The Minutes of the Annual General Meeting held on 18 May 1993, which had been published (*Bull. Brit. Orn. Cl.* 113: 129–130), were approved and signed by the Chairman.

The Report of the Committee for 1993, which had been published in the *Bulletin*, was presented and on the proposal of the Honorary Secretary, seconded by the Honorary Treasurer, it was unanimously received and adopted.

The Accounts for 1993 were presented to the meeting. The Honorary Treasurer said that the whole of the Herbert Stevens Fund is now invested with NCL, a firm of fund managers chosen by the Trustees. The Honorary Treasurer proposed, seconded by the Honorary Secretary, that the accounts for 1993 should be adopted. This was carried unanimously. The thanks of the members of the Club to the Trustees of the Herbert Stevens Fund were recorded.

The Editor said that there had been very little change in the intake of papers in 1993, and the publication delay has returned to about one year. He said that of the many books received for review it was possible, for reasons of space, to publish reviews of only a few, and the practice would be, as in the past, to restrict reviews mainly to works of faunistic or taxonomic interest.

There being no additional nominations, the following were declared elected:

Hon. Secretary: Mrs A. M. Moore (re-elected)
Hon. Treasurer: S. J. Farnsworth (re-elected)
Committee: Miss H. Baker (*vice* Cdr M. B. Casement who retired by rotation and was ineligible for re-election).

The Chairman expressed his appreciation of the work of the Officers and Committee during the year and he particularly thanked Mr Ron Kettle and Mr Pat Sellars for organising the projector and sound equipment at meetings.

No other business had been notified in accordance with Rule 12.

The meeting closed at 6.18 p.m.

The eight hundred and thirty-seventh meeting of the Club was held in the Senior Common Room of the Sherfield Building, Imperial College, South Kensington, on Tuesday 22 February 1994 at 6.16 p.m. 33 Members and 28 Guests attended.

Members attending were: D. Griffin (*Chairman*), M. W. Woodcock (*Speaker*), M. A. Adcock, Miss H. Baker, P. J. Belman, P. J. Bull, D. R. Calder, Cdr M. B. Casement RN Retd, Professor R. J. Chandler, Dr R. A. Cheke, C. A. R. Helm, K. W. Henschall, R. H. Kettle, Dr C. F. Mann, Dr J. F. Monk, D. J. Montier, Mrs A. M. Moore, R. G. Morgan, Mrs M. Muller, P. J. Oliver, J. G. Parker, R. E. F. Peal, R. C. Price, Dr R. Prŷs-Jones, A. J. Randall, M. Romer, Dr C. Ryall, R. E. Scott, P. J. Sellar, Dr R. Self, N. H. F. Stone, Dr J. F. Walsh, C. E. Wheeler.

Guests attending were: Mrs B. Adcock, R. Allen, I. Bishop, Mrs G. Bonham, Mrs J. Bull, Mrs J. B. Calder, Mrs E. Chandler, M. Davies, P. Delaloye, Mrs J. Gladwin, G. Green, Mrs A. Helm, K. J. Herbier, P. Hirslund, Ms C. Hoff, Mrs D. Monk, Mrs M. Montier, P. J. Moore, R. Newton, Mrs E. Newton, B. O'Brien, Mrs B. Peal, Dr A. Richford, Mrs M. Seton-Watson, Miss R. Warren, R. Webb, Mrs K. D. Wheeler, Mrs B. Woodcock.

After supper Mr Martin Woodcock spoke on the birds of three forests in Africa—two montane and one lowland—and illustrated his talk with slides. The forests discussed were at Uhafiwa, near Chita in the "Eastern Arc" montane area in Tanzania; at Minziro, in extreme northwest Tanzania, an extension of the Malabigambo forest in Uganda; and Mount Kupe in Cameroon. The main characteristic of the avifauna at Minziro is that it is typical in many ways of that of the great central African lowland forest, though prior to 1984 it had not been visited by ornithologists for nearly 50 years. Recent surveys have added 21 species to the known avifauna of Tanzania. He drew attention to the high degree of endemism in the two widely separated montane areas, at the same time noting the fact that a number of species such as Mountain Greenbul *Andropadus tephrolaemus*, Crossley's Ground-thrush *Zoothera crossleyi*, Abyssinian Hill-babbler *Alcippe abyssinica* and Red-faced Crimsonwing *Cryptospiza reichenovii* which are found in the Cameroon mountains re-appear at similar altitudes in central and east Africa, but are absent from the intervening areas of lowland forest. In commenting on the large number of endemic species restricted to the Eastern Arc forests—endemism which is even more marked in reptiles, amphibians and plants than in birds—he instanced the existence of a bush-shrike, a newly-discovered partridge, several warblers, a weaver, several sunbirds and especially small turdids as noteworthy. In sharp contrast however, is the lack of an endemic greenbul in these forests, despite the high degree of speciation and sympatry in this group to be found in central Africa from east of the Congo river to the Ruwenzoris. He illustrated this anomaly of greenbul distribution with maps and diagrams, and postulated the existence of an as-yet undiscovered species of greenbul in the Eastern Arc forests.

The eight hundred and thirty-eighth meeting of the Club was held in the Senior Common Room, Sherfield Building, Imperial College on Tuesday 19 April 1994 at 6.15 p.m. 27 Members and 16 Guests attended.

Members attending were: D. Griffin (*Chairman*), Miss H. Baker, B. H. Beck, P. J. Belman, K. Betton, P. J. Bull, D. R. Calder, Dr R. A. Cheke, S. J. Farnsworth, Revd T. W. Gladwin, A. Gibbs, C. A. R. Helm, K. Herber, Ms R.-M. Jones, K. W. S. Kane, R. Kettle, Dr C. F. Mann, D. J. Montier, Mrs A. M. Moore, R. G. Morgan, J. G. Parker, R. E. F. Peal, J. E. Richardson, Dr C. Ryall, Dr R. Self, P. J. Sellar, N. H. F. Stone.

Guests attending were: J. Wyatt J.P. (*Speaker*), Miss S. Astle-Fletcher, Mrs J. Bull, D. Couzens, E. Dunn, Mrs F. Farnsworth, H. F. Fox, Mrs J. Gladwin, Ms K. Hoff, S. Jones, J. McEachen, Mrs M. Montier, P. J. Moore, N. Pearce, R. Ranft, Miss R. Warren.

The birds of eastern Poland, a country almost on our doorstep, yet still little known to British ornithologists, was the subject of John Wyatt's address. He concentrated on the northeastern part of the country, and introduced the audience to some apparently tongue-twisting localities, which really do not present a pronunciation problem once the rules are learnt, as the spelling is phonetic. The magnificent Bialowieza Forest on the Belarus frontier was one area that received attention. This forest is not only home to Black Storks *Ciconia nigra*, an impressive array of raptors, both diurnal and nocturnal, Cranes *Grus grus*, most European species of woodpecker, Bluethroat *Luscinia svecica*, Collared and Red-breasted

Flycatchers *Ficedula albicollis* and *F. parva*, but also to a number of mammals of restricted distribution, such as the European Bison *Bos bonasus*. An account of the Biebrza Valley, which includes forest and heathland, as well as extensive marshes, was also presented to us. This is a breeding area of many raptors, a variety of rallids (including Corncrake *Crex crex*, and Spotted and Little Crakes *Porzana porzana* and *P. parva*, Crane, Great Snipe *Gallinago media* and other waders, Black and White-winged Terns *Chlidonias niger* and *C. leucopterus*, and various warblers, including Aquatic *Acrocephalus paludicola*. Some species, such as the last mentioned, are represented by globally-important breeding populations in Poland.

The speaker certainly whetted appetites for a first or a repeat visit to that country, but he drew attention to proposals for large scale agricultural developments which threaten many of the pristine areas of eastern Poland.

The eight hundred and thirty-ninth meeting of the Club was a second visit, together with members of staff of Whipsnade Wild Animal Park, to the Sub-department of Ornithology of The Natural History Museum, at Tring. Members of the Club attending were: M. A. ADCOCK, Mrs P. E. BRADLEY, B. H. BECK, Cdr M. B. CASEMENT RN, S. J. FARNSWORTH, Mrs F. FARNSWORTH (*guest*), Revd T. W. GLADWIN, K. W. S. KANE, N. J. MALCOLM, J. M. REED, C. F. TURNER.

The eight hundred and fortieth meeting of the Club was held after the Annual General Meeting in the Ante-room of the Sherfield Building, Imperial College on Tuesday 24 May 1994 at 6.15 p.m. 27 Members and 8 Guests attended.

Members attending were: D. GRIFFIN (*Chairman*), Dr P. LACK (*Speaker*), M. A. ADCOCK, Miss H. BAKER, P. J. BELMAN, Mrs D. BRADLEY, Cdr M. B. CASEMENT RN, Professor R. CHANDLER, Dr R. A. F. COX, S. J. FARNSWORTH, A. GIBBS, Revd T. W. GLADWIN, C. A. R. HELM, R. H. KETTLE, I. LEWIS, Dr J. F. MONK, D. J. MONTIER, Mrs A. M. MOORE, R. G. MORGAN, Mrs M. MULLER, R. E. F. PEAL, Dr R. SELF, R. E. SCOTT, Dr D. W. SNOW, S. A. H. STATHAM, N. H. F. STONE, A. R. TANNER.

Guests attending were: M. BRADLEY, Mrs F. FARNSWORTH, Mrs J. GLADWIN, Ms K. HOFF, Mrs S. LEWIS, Mrs M. MONTIER, P. J. MOORE, Mrs A. SCOTT.

Dr Peter Lack spoke after supper on "Birds and Farming". He has sent the following summary of his talk.

Farmland occupies 70% of the land surface of Britain and is an important habitat for many birds and other wildlife. Farming also affects birds in many ways, only some of which could be mentioned.

The BTO's Common Birds Census and the New Atlas of Breeding Birds both indicate that birds in farmland (especially some of the small hedgerow passerines and those which eat predominantly seeds) have been declining more than those in other habitats. Some of the declines can be related to modern farming practices such as the increased use of herbicides over the last 15–20 years. The Common Birds Census also provides information on habitat preferences. In general, when nesting in arable fields, field-nesting species seem to prefer spring-sown to autumn-sown crops. A special survey of the Lapwing showed this preference particularly strongly and that they also like to nest where there are grass fields nearby, probably because this is the preferred field type for their chicks. In contrast, among hedgerow passerines there is a strong preference for nesting in hedges adjacent to oilseed rape, perhaps because it is easier for the birds to forage on the ground beneath this crop than it is under most cereals. For species feeding on invertebrates in winter there is a strong preference for permanent grass fields especially those on which manure has been spread.

Hedges are arguably the most important habitat feature for birds in farmland. However, it is essential that the hedges are managed; unmanaged hedges often quickly become less suitable as they tend to become thin near the base. One of the most important factors determining the numbers of birds in a hedge is the presence of trees; it appears that even small trees have a beneficial effect, but it is not clear exactly what many of the birds use the trees for.

Farmland has been relatively neglected as a habitat by conservationists, but it is essential that birds and other wildlife continue to be monitored there as a measure of overall health of the environment and to find out how the landscape is used.

British Ornithologists' Club
Income and Expenditure accounts for the year ended 31 December 1993

	1993 £	1993 £	1992 £	1992 £
INCOME				
Subscriptions received				
Members	4,660		5,040	
Non-member Subscribers	2,547		2,738	
Less: Subscription recruitment expenses	(209)		—	
		6,998		7,778
Donations received		17		17
Investment income				
Stevens Bequest Fund:				
COIF 2 Interest	—		10,227	
NCL Fund Managers	4,565		—	
Barrington Trust Fund (COIF Income Shares)	33		33	
Interest received:				
Barclays Prime Account	129		313	
Barclays Prime (Centenary) Account	—		97	
COIF Deposit Account	3,472		3,222	
		8,199		13,892
Property				
Capitalisation of Legal Fees arising in 1989 and 1990 re planning permission		—		2,143
Income Tax recovered				
Deeds of Covenant		360		324
Bulletin back numbers				
Sales	1,036		126	
Less: distribution costs	—		(15)	
		1,036		111
Cost of sales (Bulletin)				
Opening stock	(100)		(100)	
Closing stock	100		100	
		—		—
Meetings				
Income	3,766		3,137	
Less: Restaurant charges	(3,710)		(3,413)	
Speakers' expenses/notices etc	(390)		(130)	
Bar charge	(317)		(159)	
		(651)		(565)
Centenary Dinner				
Income	58		2,548	
Less: Restaurant/hall hire	—		(3,138)	
Notices etc	(74)		(139)	
		(16)		(729)
Club ties				
Sales	163		639	
Less: Opening stock	—		(300)	
Notices etc	—		(69)	
		163		270
		16,106		23,241
EXPENDITURE				
Bulletin BOC				
Publication and printing	9,124		9,380	
Additional offprints (separates)	208		238	
	9,332		9,618	

Expenditure *continued*				
Less: Offprint sales	(153)		(110)	
Authors' contributions	—		(155)	
	9,179		9,353	
Editor's honorarium	750		750	
Editorial and secretarial expenses	14		85	
Address labels	527		651	
Postage	1,293		1,430	
	11,763		12,269	
Special Centenary Issue Vol. 112A				
Publication and printing	693		10,489	
Additional offprints (separates)	—		580	
	693		11,069	
Less: Sales (excluding offprints)	(1,886)		(1,799)	
Offprint sales	(264)		(170)	
	(1,457)		9,100	
Editorial expenses	38		139	
Notices etc	54		257	
Postage—1993	225		652	
—1992	15		—	
	(1,125)		10,148	
"Birds, Discovery and Conservation"				
Contribution to publication and printing	3		5,372	
Less: Sales	(660)		(3,110)	
Donations	—		(750)	
	(657)		1,512	
Notices	—		68	
Postage	76		250	
	(581)		1,830	
"Extinct and Endangered Birds"	89		—	
Projection Equipment—depreciation	10		10	
Committee Administration				
Postage	409		330	
Stationery and printing	523		676	
Secretarial	65		—	
Telephone	173		369	
	1,170		1,375	
Insurance	75		50	
Accountancy—(Ordinary Funds)	947		967	
—(Herbert Stephens Fund)	117		—	
Bank charges	90		55	
Credit card charges	47		124	
Miscellaneous	48		124	
Miscellaneous—1992 Adjustment	77		—	
	1,401		1,320	
Total expenditure		12,727		26,952
Excess of Income over Expenditure		3,379		(3,711)

Balance Sheet as at 31 December 1993

	1993 £	1993 £	1992 £	1992 £
General Fund				
Balance at 1 January 1993	29,517		33,228	
Add: Excess of income over expenditure	3,379		(3,711)	
Balance at 31 December 1993		32,896		29,517
Barrington Trust Fund				
Balance at 1 January 1993 and at 31 December 1993		577		577
Stevens Bequest Fund				
Balance at 1 January 1993	145,017		157,747	
(Loss) on sale of Freehold Property	(64)		(12,730)	
Balance at 31 December 1993		144,953		145,017
		178,426		175,111
Represented by:				
Barrington Trust Fund Investment				
Charity Fund 111.57 COIF Income shares—at cost		577		577
Stevens Bequest Fund Investment				
COIF No. 2 Account	—		145,017	
NCL Fund Managers	144,953		—	
		144,953		145,017
Fixed Assets				
Projection Equipment		80		90
Current Assets				
Stock of Publications	100		100	
Cash in Hand	43		13	
Cash at Bank				
—Barclays Prime Account	3,686		17,837	
—Barclays Prime (Centenary) Account	129		132	
—Lloyds Current Account	—		23	
—Post Office Giro Account	—		116	
—COIF Deposit Account	18,314		19,195	
—COIF No. 2 Account	18,653		14,429	
Sundry Debtors	490		26	
		41,415		51,871
Current Liabilities				
Subscriptions received in advance				
—Members	2,129		1,686	
—Non-member Subscribers	1,623		1,723	
—Members refund	20		17	
Sundry Creditors	4,827		19,018	
		(8,599)		(22,444)
		178,426		175,111

Stevens Bequest Fund Investments
Balance Sheet as at 31 December 1993

	1993	1993
General Fund Assets		
Investments at Cost	137,308	
Current Assets		
Gartmore Deposit	7,645	
Net Current Assets		144,953
		144,953

AUDITORS' REPORT

To the Members of

BRITISH ORNITHOLOGISTS' CLUB

We have audited the financial statements in accordance with Auditing Standards.

In our opinion the financial statements give a true and fair view of the state of the Charity's affairs at 31 December 1993 and of its Income and Expenditure for the year then ended.

Prince Albert House
20 King Street
Maidenhead, Berks
17 May 1994

DONALD REID & CO.,
Registered Auditors

Approved by the Committee on 24 May 1994
D. GRIFFIN, Chairman

A revised key for *Cercococcyx* cuckoos, taxonomic status of *C. montanus patulus* and its occurrence in Zaïre

by Michel Louette & Paul Herroelen

Received 4 June 1993

When examining the *Cercococcyx* collections in the Royal Museum for Central Africa (KMMA), we discovered that the identification key in Chapin (1928, 1939), though useful for most adult birds, does not permit separation of all specimens. Below, we propose a revised key. Chapin gave a definition of this genus and a good account of its taxonomic history. Since he examined the holotypes of *mechowi* and *olivinus* himself, described *montanus* (a montane bird from the Albertine Rift) and accepted *patulus* Friedmann, 1928 (a migratory bird, breeding in southeastern Africa, not montane in general) as a race of *montanus*, we feel that these names are solidly based (for synonymy, see Chapin 1939). But the relationship between the four taxa is open to debate (see below).

In Fry *et al.* (1988), hereafter called *Birds of Africa*, nominate *montanus* is treated very briefly, more attention being given to *patulus*; furthermore, tail measurements provided therein for certain species in this genus are confusing. This is remarkable because according to M.P.S. Irwin (pers. comm.), the author of the Cuculidae section, the measurements were obtained from C.W. Benson. But Benson (1964) has another set for two species, which appears to be correct. We suppose that, apart from obvious errors, some very low values obtained on immature birds or specimens in moult were included in *Birds of Africa*. Our measurements, taken on material from Zaïre in KMMA, with additional specimens from elsewhere in Africa, on loan from the Royal Institute of Natural Sciences, Brussels (KBIN), The Natural History Museum, Tring (BMNH), the National Museums of Kenya, Nairobi (NMK), the National Museum of Zimbabwe (NMZ) and the American Museum of Natural History, New York (AMNH), are given in Table 1. Care was taken to measure the undamaged central rectrix.

Benson (1964) mentioned the fact that southern populations of *olivinus* tend to be larger and Chapin's (1928) measurements of central and western birds seem to confirm this; indeed, our largest specimens come from southern Zaïre and northern Zambia (the part of the range outside the equatorial forest belt), but since there is overlap, we do not recommend nomenclatural separation. There is some non-geographical variation in plumage of apparent adults, especially in *olivinus*: some individuals possess narrow white markings on secondaries and on the greater wing coverts, and also the extent of pale rufous barring on primaries and wing coverts is variable in several species. Another variable character is the buffish or white colour on the ventral side in *olivinus* (KMMA and AMNH specimens) and also in *patulus* (Keith 1968). It is not excluded that this variation is due to sexual

TABLE 1
Wind chord and tail length measurements in mm for *Cercococcyx* spp.

		Wing		Tail	
	n	range	mean, s.d.	range	mean (*n*), s.d.
C. mechowi					
juveniles	4	123–136		142–167	
immatures	5	127–138		172–195	
males	32	129–147	135.7, 4.1	170–197	185.1(30), 7.0
females	11	131–140	136.0, 4.3	172–195	182.2, 7.9
adults (sex?)	3	133–134		173–181	
C. olivinus					
juveniles	2	124–130		115–137	
immatures	3	130–149		162–193	
males	20	139–165	147.1, 6.5	157–205	176.1(18), 10.8
females	6	141–154	148.0, 4.5	165–183	178.4(5), 6.8
adults (sex?)	4	147–161		174–200	(3)
C. m. montanus					
immatures	6	127–136		162–179	
males	18	134–148	140.3, 3.6	180–190	186.3(13), 3.4
females	11	133–145	139.6, 3.8	182–187	184.3(10), 2.7
C. m. patulus					
immatures	2	140–142		175–177	
males	9	143–154	148.8, 3.8	175–190	181.0, 5.3
females	2	144–154		167–187	
adult (sex?)	1	148		181	

Notes. Data for *mechowi, olivinus* and *montanus* mainly from Zaïre; for *patulus* from Tanzania and Malawi, and two from Zaïre. Blake *et al.* (1990) give wing 143, tail 196 mm for a specimen of *m. montanus* from Burundi.

dimorphism, but the label data do not confirm this supposition. Our measurements (Table 1) indicate there is no sexual size difference.

Immature plumages

The nestling to immature stages have not been well described (which has hampered, e.g., field identification by such authors as Brosset & Erard 1986). We believe the adult plumage is acquired after one moult, although we do not exclude the possibility that the second plumage may be recognisable. Here follow the descriptions.

C. mechowi. The young bird is blackish on throat and breast and has narrow chestnut (colour 32 in Smithe 1975) edges to those feathers and also to those on head and neck (the indication "rusty" in *Birds of Africa* would be applicable to all *Cercococcyx* species; it appears also that the illustration therein is not altogether satisfactory, the immature "*C. mechowi*" in fact resembling *C. montanus*).

C. olivinus. In the first plumage, the young has a tawny (colour 38 in Smithe 1975) overlay on the whole of the head, shoulders and mantle. There are four young specimens from Zaïre, all with this general colour, especially as nestlings. Later, as fledglings, the colour is paler, the wing coverts and tail feathers showing tawny edges. At no stage is the young barred dark brown and black as in *mechowi*, nor has it ever a black throat. The BMNH *olivinus* specimen from Kumba, Cameroon, 29 July 1950, is in the transitory stage towards adult, moulting directly from the juvenile plumage, wherefrom feathers are retained (apart from primaries, secondaries, tertials and rectrices, identified by wear) in the mantle and in the wing coverts, where the contrast in colour is very apparent.

Nominate *C. m. montanus*. The young has narrow cinnamon (colour 39 in Smithe 1975) edges to the dark brown head and mantle feathers. The throat is dusky, streaked with white and edged cinnamon; the breast is blackish, streaked in a pattern which Chapin describes as "lunulate". We have examined in KBIN a very young *montanus*, collected at Munga, Kivu, Zaïre, by Prigogine's collector on 26 March 1988 (wing 105 mm, tail 70 mm), matching the one described so well by Chapin (1928). The adult plumage is somewhat neotenic (Friedmann & Stager 1964); dorsally it is paler than the juvenile, but showing also fringes on the feathers which are basally more olivaceous than the juvenile ones. (No really young specimen of *C. m. patulus* was found.)

In *m. montanus* and *mechowi*, young birds have narrow rusty margins to the tips of primaries and secondaries; these last longer on the secondaries due to wear on primaries, and are still visible at the moment the bird has acquired a second generation tail.

Hence, in this genus the juveniles differ substantially although the adults are quite similar. The different age plumages were well examined in *Cuculus* by Bannerman (1921) and Friedmann (1930, 1948); less so in the present genus. No author after Reichenow (1903), except Friedmann (1948) for the sole species *olivinus*, mentions the white tips to all rectrices (which are broad) as being the best character to recognize the adult. In fact, the first generation tail feathers in *Cercococcyx* (and certain *Cuculus*, see Louette & Herroelen 1993) are narrow and end in a point, with a very narrow brownish-white tip, which wears off rapidly. Apparently, the tail moults often in a cuckoo's life, but sometimes irregularly, quite likely due to accidental loss of a feather (we examined four such adult females of *montanus*, 2 in June, 1 in August, 1 in December; apparently in the breeding period).

A revised key

1 Rectrices broad, with rounded or square tips, white-tipped (or pale rufous-tipped) for 5–8 mm; if head and mantle feathers with rufous margins, then barred not streaked on ventral side: adults 2

Rectrices pointed, not white-tipped; if prominent rufous or brownish margins on head and mantle feathers then ventral side streaked or lunulate: young birds 5

2 Adults:
Mantle olive-brown with a faint greenish-olivaceous gloss; mantle feathers with rufous edges 3

Mantle dark grey or olive-brown; plain 4

3 Ventral side pale buff; dorsal side rather pale *patulus*

Dorsal side dark with greenish sheen *montanus*

4 Crown and mantle dark grey; rufous barring on remiges and wing coverts pronounced; barring on ventral side narrow; undertail buffish orange; rump and uppertail coverts blackish, tipped and flecked with white; wing about 75% of tail length *mechowi*

Mantle dark olive brown, crown somewhat greyish; remiges and coverts may be barred, more often unbarred; ventral side pale buff with wide barring; rump and uppertail coverts dark olive-brown, lightly flecked white and buff; wing about 82% of tail length *olivinus*

5 Young birds:
throat pale; dorsal side tawny; ventral side streaked; *olivinus*
throat blackish 6

6 Crown, neck and breast feathers with chestnut edges *mechowi*

Cinnamon edges to crown, neck and mantle feathers (the young *patulus* is apparently unknown) *montanus*

The taxonomic status of *patulus*

A good illustration of the adult *patulus* is given in Clancey (1971); it is similar in pattern but much paler than *montanus*, but the "neotenic" plumage in both taxa may not be a sign of close relationship.

As mentioned above, the nestling plumage of *patulus* is unknown. But there are two birds with pointed rectrices without white tips in our sample, although the rest of their plumage is much as in adults: (1) Shimoni, Kenya coast at 7°39′S, 39°23′E, 3 September 1976 in NMK, mentioned in Britton (1977), its label bears the note "skull incompletely ossified"; and (2) Idjwi Island, *c.* 2°S, 29°E, Zaïre, 15 August 1969, in KMMA. If we assume that in this species the tail moults simultaneously with the rest of the plumage, as is the case in the other species in the genus, these two must be considered immatures (and unmoulted in body plumage?). But in nominate *montanus* the young bird has a blackish throat! If indeed the nestling plumages prove to be different, *patulus* and *montanus* should probably not be considered conspecific. But their songs seem to be very similar and distinct from that of *olivinus*, which was nevertheless considered to be their closest relative by Chapin (1939) and Stjernstedt (1984). Note that in measurements and proportion, *patulus* and *olivinus* are alike (and different from *montanus*). These two are similar in their eurytopy (for which a longer wing and a shorter tail seem appropriate), whereas the differentially proportioned *montanus* is stenotopic in montane forest and *mechowi* in lowland forest. For the time being we do not change nomenclature.

Occurrence of *patulus* in Zaïre

After comparison with specimens from southeastern Africa, if becomes clear that the specimens from Idjwi Island (mentioned above) and Gandajika (6°45'S, 23°57'E), 28 August 1951, are *patulus*. This taxon was previously unknown from Zaïre. In view of its migration in southeastern Africa, where it appears seasonally in Kenya (Britton 1977) and also in Zambia, Malawi and Zimbabwe, to breed (latest update in Taylor & Taylor 1988; also Vernon *et al.* 1989; M.P.S. Irwin), the dispersal towards Zaïre is not really surprising, although it has not yet been found close to the Zaïre border in Zambia or in Tanzania. Stjernstedt (1984) assumes that *patulus* is montane in the northern part of its range and not in the south, but we think this migrant was found at high elevations in Kenya and Tanzania because of the forested habitat, not because of altitude; in Zaïre there is no lack of good forest at lower elevation and *patulus* could be of more than irregular occurrence.

In contrast, judging from the number of specimens, *C. m. montanus* must be a common resident in its restricted montane haunts in the Albertine rift of Zaïre.

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Distributional and other noteworthy records for some Bolivian birds

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With respect to other countries in South America, our knowledge of the distribution of birds in Bolivia is unparalleled. That significant sections of the country remain little-known ornithologically is clear, but the fact that what information has been amassed is organized and readily accessible to all (Remsen & Traylor 1989) provides a unique frame of reference for further investigation. Remsen & Traylor (1989) documented records for all Bolivian birds on a departmental level, and indicated those departmental records included on the basis of tape recordings, photographs, and sight records. Several subsequent papers have continued to update Remsen & Traylor (1989) on a departmental level. Publication of range extensions for Bolivian birds is especially important not only because such work updates a relatively complete data base, but also because so many species of birds, from a diverse set of biomes including grasslands, chaco woodland, Amazonian rain forest, and the entire range of Andean habitats, reach a latitudinal or longitudinal range limit within Bolivia.

In this paper we present noteworthy distributional records of Bolivian birds observed primarily in February–March 1992 and March 1993, in addition to some earlier records not previously reported in the literature. Included are one new record for the country (a sighting of several Lesson's Seedeaters *Sporophila bouvronides*), 30 new departmental records, documentation of some species listed by Remsen & Traylor (1989) as sight records, and a few accounts discussing other aspects of the distribution of certain species. Photographs, video recordings and tape recordings documenting some of these records will be archived at VIREO (Visual Resources for Ornithology, The Academy of Natural Sciences, Philadelphia, Pennysylvania) and the Library of Natural Sounds (Cornell Laboratory of Ornithology, Ithaca, New York), respectively. Many of these records were corroborated, and in some cases documented, by participants on natural history tours led by the authors. In determining what records to include in this paper, we have referred heavily to Remsen & Traylor (1989), as well as all subsequently published information on the distribution of Bolivian birds. Some of our records may in fact be preceded by the unpublished records of others. We hope that any such records will find their way into the literature where they become available to all. Departments are abbreviated: Cochabamba (CO), La Paz (LP), Oruro (OR), and Santa Cruz (SC). Sight records are indicated by an asterisk. Authors' initials are used throughout.

GREAT EGRET *Casmerodius albus**

OR: RAR and JLR observed a single Great Egret at Lago Uru-uru, 3700 m, on 18 Oct 1987, and another was seen by RAR at the same locality on 30 Oct 1990. These appear to represent the first records for OR.

SNOWY EGRET *Egretta thula**

OR: The first record of Snowy Egret in OR was reported by Davis *et al.* (1994) as a sighting at Lago Uru-uru on 13 Nov 1991. On 25 Oct 1979, RAR and R. S. Ridgely saw two Snowy Egrets at this locality. Subsequently, singles have been seen at Lago Uru-uru on 5 occasions, 1985–1992. Apparently, there still is no documented record for *E. thula* in OR.

MAGUARI STORK *Ciconia maguari*

SC: The Maguari Stork is known from SC on the basis of a sight record of a single individual seen 5 km S of Concepción on 28 Nov 1986 (Davis 1993). RAR saw a single *C. maguari* in marshy fields east of Montero on 3 Oct 1982, five individuals in this area on 11 Oct 1986, and singles on 17 Oct 1987 and 18 Oct 1990. On 7 Mar 1993, JLR and BMW counted 28 individuals in wet, grassy fields between 10 km S of Montero and 20 km E of that town, along the road to Okinawa. On these same dates in 1992, when local conditions were much drier, no *C. maguari* were observed. The elevation at Montero is *c.* 450 m. One of the *C. maguari* observed in 1993 was photographed, providing the first documented record for SC.

OR: On 30 Oct 1990, RAR saw two Maguari Storks in the extensive marsh at Lago Uru-uru at *c.* 3700 m. Fjeldså & Krabbe (1990: 82) reported that *C. maguari* "wanders to 2500 m in Cochambamba," and gave no higher records for elsewhere. This sight record represents the first report for OR and the altiplano in general.

FULVOUS WHISTLING-DUCK *Dendrocygna bicolor**

OR: Two Fulvous Whistling-Ducks were observed by JLR and others on 19 Mar 1992 at Lago Uru-uru, at *c.* 3700 m. Having ascertained that the birds were whistling-ducks, all observers noted the generally light-brown plumage of the birds from the dark-capped head (which lacked any indication of white or rusty-white in the facial region) through the underparts, the darker back, the lengthened, white-edged flank feathers, and white band crossing the base of the tail. This is apparently the first report of this species in OR.

CO: On 16 Mar 1993, JLR and BMW saw a single *D. bicolor* at Lago Angosturas, *c.* 3000 m, approximately 20 km W of the city of Cochabamba. Fjeldså & Krabbe (1990) regarded a record from 2550 m in CO as "accidental".

BROAD-WINGED HAWK *Buteo platypterus**

The Broad-winged Hawk is known in Bolivia from only about three records (Remsen & Traylor 1989). We here report several sight records, mostly of single, soaring birds: 3 near Villa Tunari, **CO**, 780 m, 31 Oct 1985; one along the road between Tablas Monte and Villa Tunari, **CO**, 27 Oct 1990 (RAR; elev. not determined); one near Tablas Monte, **CO**, 2850 m, 15 Mar 1993; two above Coroico, **LP**, 27 Oct 1979 (RAR, R. S. Ridgely; elev. not determined); one in P. N. Amboró (NE Mairana, above La Yunga), **SC**, 2240 m, 16 Feb 1992; one 10 km E Montero, **SC**, 450 m, 7 Mar 1993; and one over the Serrania de Siberia, SC, 2850 m, 11 Mar 1993.

ZONE-TAILED HAWK *Buteo albonotatus**

CO: A single adult was seen briefly in flight over humid forest along the road between Tablas Monte and Villa Tunari at about 1525 m on 17 Mar 1993 (BMW, JLR). We thought at first that this dark raptor was going to be a Turkey Vulture *Cathartes aura* because of the general shape and dihedral flight profile, but we immediately noticed the bright-yellow cere and legs, barring on the underside of the primaries, and conspicuous white bands on the tail. This represents the first report of *B. albonotatus* for CO.

BAT FALCON *Falco rufigularis*

LP: On 24 Feb 1992, a single Bat Falcon was observed along the ridge (*c.* 3250 m) between Cotapata and Chuspipata (BMW, JLR). The highest published elevation we have been able to find for this wide-ranging raptor is 1600 m (Hilty & Brown 1986). Fjeldså & Krabbe (1990) report that the similar *F. deiroleucus* (Orange-breasted Falcon) "can possibly reach the lower fringe of the temperate zone" (which they define as 2500 m; p. 16) in some parts of its range. We noted that the bird near Chuspipata was too small to be a *F. deiroleucus*, had only a limited amount of orange feathering on the lower breast, and had the small feet typical of *F. rufigularis*. Upon our approach, the bird vocalized several times, and we were able to obtain tape-recordings. This high-elevation record probably represents a wandering individual, or perhaps a migrant from the south (the species occurs south to Tucuman and Santiago del Estero, Argentina), although to our knowledge, latitudinal migration has not been reported for *F. rufigularis*. The seasonal status of *F. rufigularis* in the southern terminus of its range should be documented as a first step in determining whether birds from this area are migratory.

ANDEAN GUAN *Penelope montagnii*

SC: BMW observed a single individual on 17 Feb 1992 in P. N. Amboró (about 22 km by road NE Mairana, above La Yunga), at about

2100 m. On 11 Mar 1992 and 11 Mar 1993 in the Serrania de Siberia, 2780 m, JLR and BMW observed a total of four *P. montagnii*. The 1992 sighting was documented with video recording of two individuals made by Howard Wilson. There are few reports of *P. montagnii* from SC. Remsen & Cardiff (1990; graph p. 975) showed only one specimen locality for SC.

AMERICAN GOLDEN PLOVER *Pluvialis dominica**

In the latter half of Mar 1992 (BMW, JLR) and the first half of Mar 1993 (BMW, O. Rocha), migrant groups of *P. dominica* were noted at several localities on the Bolivian altiplano in **OR** (about 40 individuals outside the town or Oruro; 3700 m) and **LP** (2 localities at approximately 4000 m near El Alto, above the town of La Paz, and 2 localities near Lago Titicaca, 3800 m and 4100 m). More than 250 individuals were noted in one of the groups near La Paz. An additional LP record is of four *P. dominica* seen by RAR and T. A. Parker III on 19 Oct 1983 at Caranavi, 650 m. RAR has observed one to four individuals near Lago Uru-uru, 3700 m, **OR**, in late Oct and early Nov several years since 1984. The only previous published record from La Paz is of an individual collected 12 April 1992 at Guaqui, 3600 m (Remsen *et al.* 1985). Remsen & Traylor (1989) cited Remsen *et al.* (1985) as the source for the occurrence of *P. dominica* in **OR**, but there is no mention of a record for that department in that paper (or in other papers in that series). Fjeldså & Krabbe (1990) reported that "large numbers can be seen around 4000 m on altiplanos of NW Argentina, Bolivia, and Peru in Mar–Apr", but cited no references or specific occurrences.

GREY PLOVER *Pluvialis squatarola*

OR: RAR observed a single bird on a mudflat at Lago Uru-uru, 3700 m, on 3 Nov 1985. It was watched as it foraged on the mudflat, and the black axillars and whitish upper tail-coverts and tail were seen clearly in flight. This represents the first report for OR, and apparently only the second record for Bolivia. The first record was of a single bird observed by B. D. Glick at the sewage ponds of the city of Santa Cruz de la Sierra, SC, on 6 Nov 1983 (Schmitt *et al.* 1986).

UPLAND SANDPIPER *Bartramia longicauda**

SC: BMW and JLR observed single individuals about 10 km NE and 15 km SE of Santa Cruz de la Sierra, *c.* 450 m, on 7 Mar 1993. Additionally, they heard the distinctive flight call of *Bartramia* several times in close succession on the early evening of 12 Mar 1992 near Tambo (about 15 km E Comarapa), at *c.* 1600 m. Although there are numerous records of southbound migrants (mostly observed by RAR *et al.* near Santa Cruz de la Sierra in Oct), these March records appear to be the first reports of *Bartramia* on northbound migration in Bolivia.

LEAST SANDPIPER *Calidris minutilla*

OR: A single individual was observed by BMW and JLR as it foraged along the edge of Lago Uru-uru, *c.* 3700 m, on 19 Mar 1992.

We noted the small size of this *Calidris* sandpiper, the general brownish, uniform tones of the plumage including fine, brownish breast streaks extending posteriorly to the lower breast, terminating in a fairly sharp demarcation with the whitish belly. The bill was thin, sharply pointed at the tip, and slightly decurved; the legs were distinctly yellow. The bird was photographed by William Maynard and video-recorded by Howard Wilson as it foraged and fed alongside a Baird's Sandpiper *C. bairdii*. There are four previous published records for Bolivia, all from east of the Andes (Schmitt *et al.* 1986), and one record mentioned in Fjeldså & Krabbe (1990) for "2550 m in Cochabamba." Our record represents the first for OR and apparently the first record from the Andean altiplano.

BUFF-BREASTED SANDPIPER *Tryngites subruficollis**

CO: A single Buff-breasted Sandpiper observed by RAR and S. L. Hilty on the grassy shores of Lago Alalay in the city of Cochabamba, 2550 m, on 24 Oct 1984, and two birds seen there on 1 Nov 1985, constitute the first reports from CO.

ANDEAN PARAKEET *Bolborhynchus orbygnesius*

SC: High-flying flocks of Andean Parakeets were observed in P. N. Amboró, 2250 m, on 16 and 17 Feb 1992 (BMW); at Tunal, 1850 m, on 2 and 10 Mar 1992 (BMW, JLR); and in the Serrania de Siberia, 2700 m, on 13 Mar 1992 and 11 Mar 1993 (BMW, JLR). Some of these flocks, especially at Tunal, numbered more than 300 individuals, and the 1992 sightings taken together represented well over 2000 birds. We identified these parakeets as *B. orbygnesius* by their small size, uniformly bright-green plumage, medium-length, pointed tails (no elongated tip), distinctive vocalizations, and characteristic flight patterns in high, tight, fast-flying flocks in which individuals fly with constant wing-beats without undulations (pers. obs.). The only similar-looking parakeet in Bolivia is *B. aurifrons* (Mountain Parakeet), which has an appreciably longer tail and different vocalizations, inhabits generally drier regions, and never travels in high, fast-flying flocks (rarely more than about 150 m above ground unless, perhaps, crossing a canyon; pers. obs.). Furthermore, individual *B. aurifrons* fly with several rapid wing-beats followed by a momentary appression of the wings against the body, producing an undulating flight pattern (pers. obs.). At least one flock of *B. orbygnesius* was tape-recorded for documentation, establishing the first records for SC and apparently the southernmost for the species. The Barred Parakeet *B. lineola*, which has a flight pattern and vocalizations similar to those of *B. orbygnesius*, is not known south of central Peru.

BLACK-WINGED PARROT *Hapalopsittaca melanotis*

SC: A single individual of this beautiful parrot was observed by BMW in P. N. Amboró (about 22 km by road NE of Mairana, above La Yunga) on 16 Feb 1992 at *c.* 2100 m. On 11 and 12 Mar 1992, between 2650 and 2800 m in the Serrania de Siberia, BMW and JLR observed one pair and a group of four, some of which were tape-recorded, and three of which were video-recorded by Howard Wilson as they perched in the crown of a tall tree along the road. These are the first reports of *H. melanotis* for SC, and the southernmost for the species.

ASH-COLOURED CUCKOO *Coccyzus cinereus**

CO: BMW observed a single Ash-coloured Cuckoo flying at eye-level across the parking lot of a gas station on the edge of Villa Tunari, 390 m, on 28 Feb 1992. The small size of this *Coccyzus* cuckoo, in combination with its pale, brownish-grey upperparts and wings, dark-breasted, whitish-bellied underparts, and rather short (for the genus) pale-tipped tail allowed positive identification. This was almost certainly a northbound migrant. This is the first report of *C. cinereus* from CO.

RUFOUS-BANDED OWL *Ciccaba albitarsus*

LP: RAR tape-recorded a Rufous-banded Owl at *c.* 2450 m along the road between Chuspipata and Coroico (above Sacramento Alto) on 17 Oct 1982, providing the first documented record for LP. Additionally, BMW and JLR flushed a pair of *C. albitarsus* from a day-roost at Sacramento Alto, 2400 m, approximately 8 km by road E of (below) Chuspipata along the road to Coroico, 22 Mar 1992. Although Remsen & Traylor (1989) cited no LP record for *C. albitarsus*, Fjeldså & Krabbe (1990) stated that it occurs "south to La Paz" without supporting evidence.

SC: On the early morning of 4 Mar 1992, in the Serrania de Siberia, BMW and JLR heard the unmistakable song of *C. albitarsus* coming from the steep slope of a heavily forested canyon at about 2780 m. The bird(s) was tape-recorded by JLR, establishing the first SC record and the southernmost for the species.

CHESTNUT-COLLARED SWIFT *Cypseloides rutilus**

SC: BMW observed a flock of eight *C. rutilus* at *c.* 2200 m, over P. N. Amboró (*c.* 22 km by road NE Mairana, above La Yunga), on 17 Feb 1992. The diagnostic buzzy calls of this swift were heard, and the chestnut throat was seen clearly on at least two of the birds. This is the first report of *C. rutilus* for SC, and apparently the southernmost in this species' wide distribution.

GREAT DUSKY SWIFT *Cypseloides senex**

SC: This swift is known in Bolivia from a sight record(s) by A. Kratter near Flor de Oro in northern P. N. Noel Kempff Mercado. On 28 Mar 1992, BMW saw 8–10 *C. senex c.* 10 km down the Rio Itenez/Guaporé from Flor de Oro, at *c.* 180 m near the base of the Serrania de Huanchaca. These medium-brown swifts are noticeably larger than congeners and the characteristic whitish frosting of the forehead, the anterior portion of the face, and the chin were seen well on several individuals. Seemingly ideal breeding habitat in the form of large waterfalls surrounded by forest and more open areas is present on the Serrania de Huanchaca, and it would not be surprising to discover that *C. senex* breeds in this region.

GREENISH PUFFLEG *Haplophaedia aureliae**

CO: On 27 Feb 1992, BMW and JLR observed a single Greenish Puffleg at *c.* 1890 m along the road between Tablas Monte and Villa Tunari. The bird was feeding at flowers along the roadside in moderately disturbed subtropical forest. We noted that it was an essentially all-dark, medium-sized hummingbird with a thin, medium-length, perfectly straight black bill. It had a small, white post-ocular spot, a fairly bronzy rump, and a dark, slightly rounded tail. Its whitish leg puffs were visible, but inconspicuous. There are few records of *H. aureliae* for Bolivia, where it was previously known only from LP (Remsen & Traylor 1989). This sight record indicates that *H. aureliae* occurs south at least to Prov. Chapare, CO. BMW and JLR also saw a single individual at 1940 m a few km below Sacramento Alto along the road to Coroico, **LP**, on 23 Mar 1993.

RED-NECKED WOODPECKER *Campephilus rubricollis*

This big woodpecker occupies a much greater elevational range in central Bolivia than in any other part of its wide distribution. It occurs from the wet forests of the Amazonian lowlands to humid montane forest, reaching an elevation of at least 2150 m in Prov. Chapare, **CO** (16 Mar 1992; tape-recorded) and at least 2650 m in the Serrania de Siberia, **SC** (11 Mar 1992). The highest published elevation that we have found for *C. rubricollis* anywhere is "rarely to 4000 ft on Roraima" (Short 1982). The expansion of the altitudinal distribution of *C. rubricollis* in central Bolivia appears to be an example of ecological release. Through most of the range of *C. rubricollis*, one or more congeners inhabit humid montane forest on the east slope of the Andes. *C. haematogaster* (Crimson-bellied Woodpecker) occupies the lower slopes between *c.* 1000 and 2100 m (pers. obs.) from northern Colombia (Hilty & Brown 1986) south to Cuzco, Peru (pers. obs.). The upper subtropical and temperate forests from NW Venezuela south to Amazonas, Peru, are occupied by *C. pollens* (Powerful Woodpecker; Meyer de Schauensee 1966). Thus, from Depto. Cuzco south, humid montane forest lacks other *Campephilus*, apparently allowing *C. rubricollis* to occupy a greater elevational range than possible elsewhere. We do not know if *C. rubricollis* displays this expanded elevational distribution in the area between Cuzco, Peru, and central Bolivia, where relatively little field work at pertinent elevations has been conducted, although four specimens in LSUMZ from the area between Depto. Pasco, Peru, and Prov. Chapare, **CO**, range in elevation from 1050 to 1350 m (J. V. Remsen *in litt.*).

PLAIN-MANTLED TIT-SPINETAIL *Leptasthenura aegithaloides**

CO: On 18 Mar 1992, BMW and JLR observed a single bird along the main highway W from Cochabamba toward Oruro, between the villages of Lampaya and Pongo at *c.* 4000 m. Habitat at this site was rocky slopes and cliffs with a sparse growth of *Festuca* sp. grass and widely scattered, low shrubs. The bird responded to tape playback of the song and calls from Salta, Argentina. The individual we saw had lost its tail, but we noted the tiny, thin bill; unstreaked, greyish-brown back; faintly streaked crown; narrow, whitish superciliary; and essentially unmarked, greyish underparts. This is the first report of *L. aegithaloides* from CO.

STREAK-THROATED CANASTERO *Asthenes humilis*

CO: On 24 and 25 Oct 1982, RAR and S. L. Hilty observed and RAR tape-recorded a Streak-throated Canastero at *c.* 4200 m on Cerro Tunari above Quillacollo. On 26 Feb, and on 14 Mar 1992, BMW and JLR observed a single bird at *c.* 4250 m on Cerro Tunari. These are the first records of *A. humilis* from CO.

SPOTTED-BREASTED THORNBIRD *Phacellodomus maculipectus*

CO: Remsen & Traylor (1989) cited Peters (1951) for documentation of the occurrence of this species in CO, but the correct citation is Chapman (1919) (J. V. Remsen *in litt.*). This appears to be the only report of *P. maculipectus* from CO. On 20 Oct 1984, RAR and S. L. Hilty observed six birds and several nests near El Choro, 2940 m. At least one bird was tape-recorded for documentation. Since then, *P. maculipectus* has been found at this site regularly. In Jujuy and Salta, Argentina, *P. maculipectus* apparently does not occur, or is certainly not common, above about 1800 m (pers. obs.). This is probably best explained by the rather marked lowering of the upper limit of humid forest over less than 2° of latitude as one moves south from central Bolivia through northwestern Argentina (pers. obs.), rather than by some form of competitive release in the Bolivian part of the species' range. We consider montane, forest-based *P. maculipectus* to be a species distinct from widely disjunct *P. striaticollis* of the marshes of southeastern Brazil south to Prov. Buenos Aires, Argentina, following Narosky & Yzurieta (1987).

BOLIVIAN RECURVEBILL *Simoxenops striatus*

BMW and JLR observed two individuals of this little-known furnariid *c.* 48 km by road SW Villa Tunari, **CO**, at *c.* 1080 m (28 Feb 1992) and 1090 m elevation (29 Feb 1992). In both instances the birds were foraging with mixed-species flocks of insectivores in the midstory and subcanopy of humid forest, as reported by Parker *et al.* (1992) for some *S. striatus* observed in SC. We presented both individuals with tape-recordings of the song and calls of the closely related and very similar sounding *S. ucayalae* (Parker *et al.* 1992), but this elicited no response. We noted the peculiar, upturned lower mandible on both *S. striatus* we observed, in addition to the bright, rufous-orange throat, conspicuously ochre-streaked crown (back not seen), and the blurry streaking on the underparts. Prior to our records, *S. striatus* was known in CO from one specimen collected by M. A. Carriker, at Palmar, 800 m, in July 1937 (Collar *et al.* 1992).

MONTANE FOLIAGE-GLEANER *Anabacerthia striaticollis**

SC: On 16 Feb 1992, in P. N. Amboró (*c.* 13 km by road NE of Mairana, above La Yunga; 1850–1950 m), BMW observed two individuals of this species foraging with mixed-species flocks of insectivores in the subcanopy of humid forest. These sight records represent the first report of *A. striaticollis* from SC, and the southernmost for the species.

SCALED ANTPITTA *Grallaria guatimalensis*

CO: Remsen & Traylor (1989) listed this antpitta for CO on the basis of a sight record reported by Parker & Rowlett (1984). On 2 Nov 1983, RAR tape-recorded and saw a Scaled Antpitta at *c.* 1480 m along the road between Tablas Monte and Villa Tunari, Prov. Chapare. This is the first documented record for *G. guatimalensis* in CO, and apparently the southernmost record in its wide distribution.

RUFOUS-FACED ANTPITTA *Grallaria erythrotis*

SC: Remsen & Traylor (1989) listed *G. erythrotis* for SC on the basis of a sight record by Parker & Rowlett (1984) in the Serrania de Siberia. Although it was not reported previously, RAR tape-recorded a *G. erythrotis* at this locality at 2515 m on 18 Oct 1979. Observations over the past several years have revealed that *G. erythrotis* is quite common in the Serrania de Siberia.

OLIVE-CROWNED CRESCENTCHEST *Melanopareia maximiliani*

CO: RAR and S. L. Hilty observed, and RAR tape-recorded, this species at a nest near El Choro, 2940 m, on 20 Oct 1984. The nest was "in fine yellow bunchgrass: a tunnel 4 inches long lined with thicker grass. The male sang repeatedly from near the nest" (description from RAR field notes). This is the first documented record of *M. maximiliani* from CO.

GREY ELAENIA *Myiopagis caniceps**

SC: BMW heard and saw a pair of *M. caniceps* with a small mixed-species flock of insectivores in semihumid forest at *c.* 1075 m in the valley of the Río Bermejo near the village or Bermejo on 9 Mar 1993. This sighting is one of only a few records for Bolivia, and is apparently only the second report for SC (Remsen & Traylor 1989).

HAZEL-FRONTED PYGMY-TYRANT *Pseudotriccus simplex**

SC: A single *P. simplex* was observed at *c.* 2515 m in the Serrania de Siberia, 18 Oct 1984, by RAR and S. L. Hilty. This individual responded to playback of a tape recording made at 1480 m in Prov. Chapare, CO, and was seen well. This is the first report of *P. simplex* from SC, and represents both an unusually high elevational record and the southernmost record for the species.

SLATY-BACKED CHAT-TYRANT *Ochthoeca cinnamomeiventris*

SC: *O. cinnamomeiventris* is listed for SC by Remsen & Traylor (1989) on the basis of a sight record by Parker & Rowlett (1984) from the Serrania de Siberia, 8 Oct 1983. This pair of birds was actually tape-recorded on 8 Oct 1983 by RAR, providing the first documented occurrence of *O. cinnamomeiventris* in SC, and the southernmost record for the species.

VARIEGATED FLYCATCHER *Empidonomus varius**

CO: A migrant individual observed by BMW and JLR at *c.* 2850 m on the slopes of Cerro Tunari above Quillacollo on 14 Mar 1992 was at an unusually high elevation for the species (pers. obs.). Fjeldså & Krabbe (1990) cited only one record (Oct in Ancash, Peru) for the "high Andes".

CROWNED SLATY FLYCATCHER *Empidonomus aurantioatrocristatus**

CO: A migrant individual observed by BMW and JLR near Puente Lopez Medoza on 13 Mar 1992, at *c.* 2830 m, was at an unusually high elevation for the species (pers. obs.). *E. aurantioatrocristatus* was not treated by Fjeldså & Krabbe (1990) as occurring in the "high Andes".

FORK-TAILED FLYCATCHER *Tyrannus savanna**

OR: on 20 Mar 1992, two individuals were seen migrating north a few km SW of Caracollo at *c.* 3760 m (JLR, BMW). This sight record represents the first for OR and an unusual occurrence on the Bolivian altiplano.

BARRED BECARD *Pachyramphus versicolor*

LP: J. V. Remsen, Jr. (*in litt.*) observed a pair of *P. versicolor c.* 1 km below Sacramento Alto in July 1979. At least two individuals were heard and seen along the road to Coroico at Sacramento Alto, *c.* 2500 m, on 22 Mar 1992 and 23 Mar 1993 (BMW). One individual was tape-recorded for documentation. These are the first records for LP.

SC: Several individuals were heard and seen in the Serrania de Siberia 3, 4, 11 and 12 Mar 1992 and 11 Mar 1993, at elevations ranging from *c.* 2500 to 2780 m (BMW, JLR). At least two individuals were tape-recorded for documentation. These are the first records for SC, and the southernmost for the species.

RED-CRESTED COTINGA *Ampelion rubrocristatus*

SC: Several individuals were heard and seen in the Serrania de Siberia on 4, 11 and 12 Mar 1992, and 11 and 13 Mar 1993 between *c.* 2500 and 2800 m (BMW, JLR). One or two individuals were tape-recorded on 4 Mar 1992, and a juvenile was video-recorded on 12 Mar 1992 by Howard Wilson. RAR has sight records from the Serrania de Siberia from Oct 1979 (with R. S. Ridgely), 1982, 1984, 1985, 1986 and 1987. *A. rubrocristatus* has not previously been reported from SC, although it is as generally common in the Serrania de Siberia as it is in many localities throughout its wide distribution (pers. obs.). The Serrania de Siberia marks the southernmost point of occurrence for the species.

CHESTNUT-CRESTED COTINGA *Ampelion rufaxilla*

SC: Several individuals were heard and seen in the Serrania de Siberia on 3, 11 and 12 Mar 1992, and 13 Mar 1993 between *c.* 2480 and 2800 m (BMW, JLR). An adult was extensively tape-recorded on 3 Mar. The birds were vocal, especially in 1992, and an independent juvenile, in close proximity to an adult, was observed. For much of the half hour that we observed this adult and juvenile, the latter perched quietly on a dead branch emerging from the crown of a tall tree along a ridge. Numerous mosquitoes were hovering around the bird, and appeared to be attempting to land on its head. As the mosquitoes approached closely, the juvenile cotinga deftly snapped several of them out of the air and swallowed them, one at a time. The adult and juvenile (including this behaviour) were video-recorded by Howard Wilson, and the adult was tape-recorded. Curiously, a juvenile *A. rubrocristatus* appeared to be associated with the adult and juvenile *A. rufaxilla*, following their general movements and staying close to them. No other *A. rubrocristatus* were seen in the vicinity. This appears to be one of very few localities at which these two species of *Ampelion* are both fairly common (pers. obs.), although neither had been reported from SC previously. These establish the first records of *A. rufaxilla* for SC, and the southernmost for the species.

CO: The first record for CO was recently reported as a specimen collected by S. Arias and J. Fjeldså from Prov. Chapare (Inca Chaca) near Tablas Monte, 2600 m, on 17 Oct 1991 (Davis *et al.* 1994). RAR and R. S. Ridgely saw, and RAR tape-recorded, one *A. rufaxilla* at this same locality on 21 Oct 1979. Subsequently, RAR has found *A. rufaxilla* to be regular in this area, with records in the latter half of Oct 1983, 1984, 1986, 1987 and 1990.

BAND-TAILED FRUITEATER *Pipreola intermedia*

SC: A single adult male was observed at *c.* 2780 m in the Serrania de Siberia on 12 Mar 1992. The bird was observed closely for several minutes as it perched low in a shrub at the edge of disturbed montane forest, and was photographed. This is the first record of *P. intermedia* from SC, and the southernmost for the species.

BARRED FRUITEATER *Pipreola arcuata*

SC: Several individuals and pairs of this distinctive fruiteater were heard and seen in the Serrania de Siberia on 3, 4, 11 and 12 Mar 1992, and 11 Mar 1993 between *c.* 2680 and 2800 m. Several of these were tape-recorded. These are the first reports from SC, and mark the southern terminus in this species' wide distribution.

BANK SWALLOW *Riparia riparia*

OR: The only previous report of this swallow from OR is a sight record by RAR and T. A. Parker III at Lago Uru-uru, 3700 m, on 16 Oct 1983 (Parker & Rowlett 1984). The earliest sighting for OR of which we are aware was 24 Oct 1979, when RAR and R. S. Ridgely saw three at Lago Uru-uru. Subsequently, RAR and colleagues have seen small numbers of Bank Swallows at Uru-uru in Oct over several years. On 19 Mar 1992, BMW and JLR observed four at Lago Uru-uru, at least one of which was video-recorded by Howard Wilson as it perched on a utility wire with several Barn Swallows *Hirundo rustica*. This is apparently the first documented record of *R. riparia* in OR.

BARN SWALLOW *Hirundo rustica*

OR: Remsen & Traylor (1989) list only a sight record for this swallow in OR. We noted at least 20 *H. rustica* at Lago Uru-uru on 19 Mar 1992, and Howard Wilson video-recorded several perched on a utility wire over the lake. Although there are many sight records, this apparently constitutes the first documented record for *H. rustica* in OR.

SLATY FINCH *Haplospiza rustica**

SC: Remsen *et al.* (1985) reported the only record of this enigmatic finch from SC as a specimen collected "30 km W Comarapa, 8200 ft", a locality that these authors place in the Serrania de Siberia. On 16 Feb 1992, BMW observed a pair on the ground along the edge of a trail through humid montane forest in P. N. Amboró, *c.* 22 km by road NE of Mariana, above La Yunga, at *c.* 2200 m. The male was uniformly dark slaty grey, very slightly paler ventrally. The female was much browner dorsally and had generally dirty whitish underparts, with conspicuous brownish streaks on the breast and upper belly. Both sexes had the rather thin, sharply pointed bill typical of *H. rustica*. This sight record represents a slight range extension to the south, and the southernmost point of occurrence for the species.

BOLIVIAN WARBLING-FINCH *Poospiza boliviana*

SC: The first record of which we are aware occurred on 7 Oct 1982, when RAR watched a single *P. boliviana* drinking and bathing in a small pool of water in an arid canyon at *c.* 1575 m near Tambo. At *c.* 07.00 hrs on 11 Mar 1993 BMW and JLR found at least three male *P. boliviana* singing from the twiggy tops of shrubs in disturbed roadside brush at *c.* 2640 m along the road from Comarapa to Torrecillas and the Serrania de Siberia. Two other *Poospiza, hypochondria* (Rufous-sided Warbling-finch) and *whitii* (Black-and-chestnut Warbling-finch), occur syntopically with *boliviana* at this site; we know of no other locality at which the latter has been found alongside *boliviana*. One individual *P. boliviana* was tape-recorded extensively. This represents the first documented report of this Bolivian endemic from SC.

LESSON'S SEEDEATER *Sporophila bouvronides**

SC: This seedeater breeds in northern South America (northeastern Colombia east through the Guianas) between about May and Nov, migrating south as far as Amazonian Brazil in Dec–Apr (Schwartz 1975). On 6 Mar 1992, BMW and JLR observed a group of four male *S. bouvronides* (possibly some females present as well) in tall grasses about 20 km E of Montero along the road to Okinawa. These birds were studied in detail for several minutes, and we noted the conspicuous, triangular, white malar patch surrounded by black, and that their crowns were completely black, lacking the broad white stripe that characterizes the closely related Lined Seedeater *S. lineola*. In addition, we noted that the *S. bouvronides* showed an admixture of black and white feathers on the sides of the breast, rather than the clean white of *lineola*. As there were several small flocks of *S. lineola* close to (but separate from) the four *S. bouvronides*, we were able to make immediate comparisons of plumage. Although *S. bouvronides* has not been reported from Bolivia previously, its occurrence in the grasslands of eastern Bolivia is not surprising. This area of Bolivia has received relatively much less attention from ornithologists during the wet season (approximately Dec–Apr) than during the dry months, owing to difficulty of access and hampered mobility during the wet season. That *S. bouvronides* should be found side-by-side with *S. lineola* in eastern Bolivia is mirrored by sympatry in these species in northern South America, after *S. lineola* has finished breeding and migrated north to pass the austral winter (Schwartz 1975). Our sighting of *S. bouvronides* near Montero is the first report from Bolivia, and the southernmost for the species.

GOLDEN-COLLARED TANAGER *Iridosornis jelskii**

CO: This beautiful tanager was noted with mixed-species flocks on 15 Mar 1992 (3200 m) and 15 Mar 1993 (3180 m) in humid temperate forest along the main highway between Cochabamba and Villa Tunari (BMW, JLR). These sight records represent the first reports for CO, and the southernmost for the species.

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A review of the northern *Pheucticus* grosbeaks

by Allan R. Phillips

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The essential unity and interdependence of biological data are well illustrated by migratory birds like the North American *Pheucticus* grosbeaks. Species limits depend not only on structure and colours, but also on life histories (including nests and eggs), ecology, habits, vocalizations and responses thereto, and the attendant frequency of crossing. In assessing geographic races, times of migration may mislead us.

Adult males of the black, red, and white eastern Rose-breasted Grosbeak *Pheucticus ludovicianus* cannot be confused with the mainly black, brown, and yellow western and southern Black-headed Grosbeak *P. "melanocephalus"*. Almost unanimously they have been called distinct species. Breeding in Temperate woodlands, their main summer ranges are widely separated by the mostly-herbaceous Great Plains. But along rivers, crosses or hybrids were known, and have proven common in at least one area: "Both members of the pair were hybrid in 64% of the cases" (Anderson & Daugherty 1974: 6, vs. p. 9). Similarity of voice and biology led us (Phillips *et al.* 1964) to unite the forms as "Common Grosbeak" *P. ludovicianus*, with each retaining its established English name. Though P. Unitt (*in litt.*) finds a vocal difference, I have not perceived it, and surely the resemblances are more striking.

But *melanocephalus* is still called a species or "semispecies". Some authors (Paynter 1970: 219; Anderson & Daugherty 1974: 9) consider that forms are conspecific only if interbreeding is completely random. Others (Cracraft 1983, etc.; Rising 1983; recommended for "serious consideration" by American Ornithologists' Union [A.O.U.] 1983: xix) call all populations with "separate evolutionary histories" species. (How many of these "phylogenetic species" of *Homo* ride any large city's metro or subway train?)

Seeing no valid evidence that these grosbeaks are good biological species, I now suggest the comprehensive species be called Black-hooded Grosbeak—a name appropriate to both forms and very similar to one's name. It is not in use elsewhere and should not cause confusion—especially if the classic "Abeillé's Grosbeak" is restored to *Coccothraustes (Hesperiphona) abeillei*, bringing its scientific and English names again into agreement. But I again urge continued use of Rose-breasted and Black-headed Grosbeak, Myrtle and Audubon's Warblers, Baltimore and Bullock's Orioles, Slate-colored and Oregon Juncos, etc. Even at the risk of mistaking an occasional individual, especially if aberrant (Paxton *et al.* 1976: 46), science should not retreat from clarity and precision.

Geographic variation: problems and needs

In migratory animals, accurate analysis of geographic variation requires distinguishing locally breeding individuals from non-breeding migrants. American birds were long thought to move gradually, so that by May northern breeders would have left Mexico, etc. (see for example van Rossem 1931). This simple idea is often wrong; see Phillips (1951, 1986, 1991), particularly on *Catharus* spp. It was well disproved, for numerous species, by the extensive researches of the University of Minnesota group in southeastern Veracruz, summarized by Ramos (1983).

We showed (Phillips *et al.* 1964) that *Pheucticus*'s migrations almost span the summer. Thus whether individuals are breeding locally must be determined by behaviour, ecology, state of gonads, amount of fat, and in other species moult. One cannot safely assume even mid-June to early July *Pheucticus* to be local breeders without biological data. Were such data on labels, van Rossem (1931: 292) might not have written that "The Saric series [=13 specimens from northernmost Mexico, 11 May to 13 Aug.] is, as a whole, certainly referable to the small-billed form. Only those from Saric are breeding birds." But there are no pine woods near Saric; if scattered grosbeaks do breed there, they would surely be of the larger-billed form that breeds nearby at higher altitudes in Arizona. Griscom (1934: 411) was evidently similarly confused: "Breeding specimens from Nuevo León, Tamaulipas and Guerrero" had bills intermediate between these two forms. (A similar case is that of the Western Flycatcher *Empidonax difficilis* [including *occidentalis*, etc.]; see Phillips *et al.* 1964 and Phillips 1991: xxxiii–xxxiv.)

It is thus incumbent on collectors and preparators to minimize later errors by conscientiously recording habitats and physiological and other details. Not only sex and age must be recorded as exactly as possible. See also Winker *et al.* (1991).

Sex and age variation

Correct determination of age/sex classes is often difficult in worn or badly shot birds. Many worn female Black-headed Grosbeaks cannot be sorted by age. Nor are they easily told from young males. These, in the first basic plumage, seem to differ most consistently by more extensive, visible whitish bases to the (outer) primaries and more tawny in the rump (less plain greyish fuscous). (Females average more streaked below, and nearly all have clear white superciliaries.)

Males with top and sides of head wholly black are not necessarily older than those with striped heads. Young males often approach full adult body colouration in their first year. A captive, apparently hatched in 1983, acquired these colours in the spring of 1984, but moulted back to a striped head late that summer (L. D. Yaeger *in litt.*).

Geographic variation in colour

This is slight or absent in adult male Black-headed Grosbeaks. There may be tendencies to reduced white in the tail in at least southeastern Mexico (Veracruz, Oaxaca) and in the middle wing-coverts in Nuevo León; but these would hardly identify migrants. (Some males with less white in the tail seem to be subadults.)

The scarcer useful material of other age/sex classes also shows little variation over most of the range. But the few breeding females from central Mexico (Morelos, probably west to Guanajuato) are more blackish above, with these markings more extensive; and the one from Nuevo León (DEL 23481) is decidedly the brightest yellow on the breast (medially) and upper belly. Similarly, immature males from northeastern Mexico show at least a tendency to deep, bright colouration below. Further collecting and careful study are needed; some yellow tones on the head seem to fade rapidly in the museum.

Size

General size (chord of wing, tail, and weight) averages larger in the Rocky Mountain region than in California, but with wide overlap (Table 1). Most authors see no taxonomic value here; it hardly warrants calling Rocky Mountain birds "larger, particularly of wing, tail, and bill" (Aldrich, in Jewett *et al.* 1953: 598, without measurements). Northeastern Mexican birds are no larger, and indeed may average shorter in extent (wing-span), but they are evidently somewhat heavier. This agrees with their swollen bills and presumably larger heads.

The smallest birds, in the southernmost populations (southern Oaxaca and Guerrero), may prove separable if further collecting of definitely breeding birds reinforces their distinctness and shows differences in weight and/or skeletal measurements.

Present recognition of subspecies rests entirely on bill size. But most of this variation is somewhat mosaic, not clinal. No sooner did Grinnell name a smaller-billed race from California than Ridgway (1901: 620) synonymized it. Miller (1957: 332) upheld it "in view of the prevailing large-billed characteristics of the breeding birds (K-d) [=RTM] of the Mexican mainland". But this was over-simplified. The Moore collection is especially rich in birds from Sinaloa, where the breeding grosbeaks are indeed rather large-billed; but even a hasty visit, in 1964, showed me that 5 breeding males from Cerro Teotepec, Guerrero, were

TABLE 1
Measurements (mm) of male Black-headed Grosbeaks[a]

Region, age	n	Wing chord	Tail	Bill: exposed culmen	Bill: depth[b]	Bill: from nostril	Bill: gonys	Bill: width[c]
Colorado, adults	16–27	97.5[d], 101.5–106, 106.5	(76?)[e], 78–83.5	16–18	13.5–14.5[f]	12.2, 12.6–14	11–12.3	11.6, 12–12.7
Colorado, immatures	10	97, 99.5–104, 104.5	76+, 77.5–81, 85.5	—	—	—	—	—
S. California, adults[g]	?	94, 94, 96–104	—	—	—	—	—	—
P. l. rostratus, adults[h]	4	101–104.5	78–82	18, 18.4–19.2	14.7, 15[i]	13.3, 14.8–14.9	12, 12.5–13	13–13.4[j]
P. l. rostratus, immatures[k]	3	98–100	78.5–79	17.5–18.7	14.3 ± –15.3	13.2–13.5	11.5, 12.1, 12.2	11.8, 12.4, 13
C. to S.E. Mexico, adults[l]	7	94.5, 98–102.5 [+?]	76–80.5	16.9–18+	12.8?, 13.5–?	12, 12.7–13.3, 14.3	11–12.3	10.9, 11.2–12.4, 12.7
S. Guerrero, adults	—	93.7[± ?]–99.2	74[± ?]–78.2+	17, 18–19[+?]	13.2–14	12.7–14	10.9[– ?]–12	11.2–11.7

Notes

a. Exceptional (?) measurements are set off by commas; +indicates wear, damage, or incomplete growth.
b. Depth from top of maxilla, basally, to malar apex.
c. Maximum width at base.
d. Found dead in Denver, 1 Aug; evidently migrant "*maculatus*".
e. The short-tailed ones probably subadult or "*maculatus*", somewhat worn.
f. Two males with depth 14.7 and 14.9 evidently have bills improperly closed.
g. Migrants?; *fide* J. R. Northern.
h. S. Coahuila to Jaumave, S. Tamaulipas.
i. Two males with depth 15.2 and 15.9 have bills improperly closed.
j. One with mandible 12.5 ± had it shot.
k. Nuevo León and adjacent Coahuila, Sep, Aug, Mar.
l. S. Hidalgo and State of México to Veracruz and C. Oaxaca; the short wing and narrow bill are from S. Hidalgo.

TABLE 2
Weights (g) of normal Black-headed Grosbeaks[a]

Region and source	Males (n)	Females (n)
Colorado (mostly M. K. Waddington)	41.9–48.2 (1=51?) (9)	45.6–50.1; to 51.4 [laying?] (5)
Southern California[b]	35–46 (18)	37–48.8 (15)
Arizona to Sonora (& Nayarit, 1♂), migrants (A. R. Phillips)	37.3–46.2 (5)	41.6–44.8 (very fat), 49.5 (moderately fat) (6)
Durango (R. S. Crossin, DEL; no fat)	39.5, 48 (2)	44, 46 (2)
Northern Morelos (A. R. Phillips; little fat)	——	45.6 (egg just laid) (1)
Nuevo León and adjacent Coahuila[c]	48.6, 49.3, 50.5[—] (3)	54 (1)

a. Weights considered reliable; birds with little or no fat, save as noted.
b. Probably includes fat birds; *ex* J. Sheppard & C. Collins, *fide* Western Bird-Banding Association 1971.
c. Males young, June, March, and August, A. R. Phillips; female May, ova to 2 mm, no fat, R. S. Crossin, DEL.

decidedly smaller. In 4 the gonys was at least 0.5 mm shorter than in 4 of 5 breeding males from northeastern Sinaloa (the fifth was a first-yearmale). Ridgway (1901) found Mexican females to be smallest, also, but whether these were breeding is uncertain.

Other central and southern Mexican populations are also small-billed. Birds of Michoacán seem particularly small, and should be compared to Tlaxcala specimens (MEXU). But Idaho males are not large-billed, whereas 3 females from Shasta County, California (US), are. Thus from southern and western Mexico north and west, small-billed populations are spaced too irregularly to recognize *maculatus*.

The above comparisons apply to adults. Heavy bills require some time to reach full size (see for example Parkes 1974: 458). It was thus surprising that even quite young males from northeastern Mexico had distinctly larger bills than any birds from elsewhere.

Bill *size* is not simply a matter of length and depth. Volume or swelling is apparent to careful, open-eyed inspection, whether or not it is easily and consistently measured by different persons with different calipers. Nature's truths are seen by close inspection—in this case direct comparisons—not by discarding perception in favour of statistics or other fads.

Subspecies

Through 1910 the Black-headed Grosbeak was generally considered monotypic. Then Oberholser (1919) separated Ridgway's largest birds (Arizona to Wyoming) as *Hedymeles m. papago*. A.O.U. (1931) accepted this, but gave it no winter range; while *H. m. melanocephalus* wintered to Chiapas (where in fact Black-headed Grosbeaks remain unrecorded; Alvarez del Toro 1980).

In 1932 and 1934 van Rossem transferred the name *melanocephalus* to the larger race; Kinnear informed him that the bill of Swainson's type was like the larger of two (unspecified) adult males that van Rossem had sent. Kinnear's bill measurements van Rossem called "intermediate"; but in fact the only one comparable to Ridgway's (exposed culmen) agreed exactly with Ridgway's average of the smaller (California) males. (Van Rossem's later measurement was of the "total culmen" of most ornithologists, not their "exposed culmen").

Later check-lists (A.O.U. 1957, Miller 1957, Paynter 1970) accordingly called the smaller Pacific birds *maculatus* (Audubon), named from western Oregon. (It supposedly wintered south to Mitla, central Oaxaca.) But as noted by Paynter, this was "a very weak race". The slightly larger-billed birds of the southern Rocky Mountains and northwestern Mexico merely approach somewhat.

Pheucticus ludovicianus rostratus subsp. nov.

Description. Bill largest; typically, both mandible and maxilla are more swollen than other races. Colours as in *melanocephalus*, but female and immature apparently brightest below, most richly coloured. Body larger (heavier)?

Distribution. Breeds (mainly resident?) in the oak-pine mountains of Nuevo León and adjacent states (Coahuila, Tamaulipas), northeastern Mexico. In winter to lower levels and to southeasternmost Tamaulipas (Tampico, AMNH; casually?) and probably south in mountains to western Veracruz and Guerrero (see below).

Type. First-year male, southeast of Monterrey, Nuevo León (near south foot of Cerro de la Silla at Rancho El Mezcal, *c*. 10 km east of El Canelo; thus east of Presa R. Gómez=Presa de la Boca); 6 March 1982.

Measurements of type. Length (extreme, in flesh) 212, extent 311, wings (chord) 99.5 & 100.5, tail 78.5, exposed culmen 18.7, bill from nostril 13.5, depth at anterior edge of nostril 13, depth to malar apex 15.3, gonys 12.1, maximum width of mandible (at base) 13 mm. Weight 49.3 g, very little fat. Skull apparently fully ossified.

Material examined. Nuevo León: adult males, Mesa de Chipinque, above Monterrey, 8 February and 28 March; "Boquillo", 3 & 4 June; "San Pedro Mines", 10 May. Immature males, mountains south of Monterrey, 15 September; southeast of Monterrey (type), 6 March. Female, westernmost Nuevo León, 8 May. Tamaulipas: adult male, Jaumave, 6 June. Male, "Victoria", 19 April. Female, Tampico, 18 December Coahuila: adult male, Sierra de Guadalupe, 27 April (not typical?). Immature males, easternmost and northernmost Coahuila, 9 August & 7 September. See also Remarks.

Remarks. Breeding birds of southwestern Texas (Davis Mts., especially AMNH) seem variable; the northern Coahuila (Sierra del Carmen; US) male would doubtless be *rostratus* when grown. (In the westernmost bird, from Sierra de Guadalupe, the base of the mandible was shot.)

A first-year male from La Joya de Salas, southern Tamaulipas, with a long but less swollen bill (DEL), may indicate the southern limit of *rostratus* influence. Otherwise all Nuevo León and Tamaulipas birds seen are *rostratus* except an apparent migrant male, March (Cerro de la Silla, near Monterrey; US).

The Guerrero female, moulting heavily on head and neck (southeast of Chilpancingo, April), is decidedly duller than the Nuevo León female, an adult; its bill is also smaller, but it seems to be a first-year bird. It will probably prove to be within the range of variation of *rostratus*, as its bill is near the size of Nuevo León (and Jaumave) males.

The Veracruz male (immature, south of Altogonga, 4 Jan.; DEL) resembles *melanocephalus* with a wide mandible (13.2 mm at base), but was very heavy (55 g; little fat). If the bill is full-grown, it is probably intermediate.

In collections from south of Tamaulipas, *rostratus* should naturally be scarce. Even if largely or wholly migratory, its total populations are far smaller than those of *melanocephalus* and "*maculatus*".

Migrations. Rocky Mountain region birds commonly migrate farther south than do their relatives on the Pacific slope or in Mexico. Logically, early grosbeak specimens (including various types) from central Mexico would have bills like Rocky Mountain birds (van Rossem 1934). I have seen such birds from south to beyond Chilpancingo, Guerrero (fat male adult, 6 May, San Roque, near Acahuizotla; wing 105 [some wear]; CANA). The southeastern limits of migrants are in Oaxaca, as a "Rare winter visitant in Atlantic Region, and doubtless elsewhere" (Binford 1989). I have not seen these specimens.

If Pacific *maculatus* were recognized, its migrations would be problematical, due to the small breeding birds of central and southern Mexico. But the small-billed Idaho birds, with long wings (adult males 106.2, 106.5; DEL), doubtless migrate far south.

In summary, knowledge of grosbeaks' biology, mating, vocalizations, ecology, and migrations is essential. Over-rigid species concepts, reliance on dates and general localities, and poorly labelled material have misled authors in general at both levels of species and subspecies. Rose-breasted and Black-headed Grosbeaks form a single biological species; an appropriate name would be Black-hooded Grosbeak, which would be appropriate for both rose-breasted and black-headed forms, as well as for individuals not typical of either.

Variation in colour and size, including bill size, is too slight or geographically irregular, in most of the range of the Black-headed Grosbeak, to form recognizable races, at least on presently available material. The only exception is the swollen-billed race of northeastern Mexico (possibly heaviest and, in females and immatures, brightest below), here named *rostratus*; it may or may not be largely resident. Birds breeding in southern Mexico may prove separable. Slight colour differences between females and young males are pointed out. Supposed migration from Pacific U.S.A. to Chiapas is erroneous, and to Oaxaca dubious.

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Besides the Denver Museum of Natural History, I have examined grosbeaks over the years in a number of collections, thanks to the cooperation of their authorities and owners. Most importantly, these include the American Museum of Natural History (AMNH); Delaware Museum of Natural History (DEL); Instituto de Biología, Universidad Nacional Autónoma de México (MEXU); Moore Laboratory of Zoology, Occidental College, Los Angeles (RTM); San Diego Natural History Museum, California; and U.S. National Museum of Natural History (US). Additional specimens were measured for me by K. A. Arnold and J. R. Northern. Northern, M.F. Carter, and M. K. Waddington supplied weight data. Weights taken by R. S. Crossin (DEL) were of special interest.

Specimens were lent by the late J. S. Rowley and Texas Tech University, and in my final studies at Denver (1991) by Delaware and U.S. National Museums. Mainly, however, I relied on my own series, now partially in the Canadian Museum of Nature (CANA); I was helped in assembling this by H. García F., R. Phillips F., S. Romero H., A. M. Sada, and J. S. Weske. To all of these I extend my thanks; also to L. D. Yaeger, who informed me of a quite unexpected moult, as above. For helpful comments on the manuscript I thank C. R. Preston, D. W. Snow and P. Unitt.

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Natal pterylosis of some neotropical thrushes (Muscicapidae: Turdinae)

by Mark C. Wimer & Charles T. Collins

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For many neotropical passerines, there are large gaps in our knowledge of natal pterylosis. In addition, descriptions of natal downs (neossoptiles) are often based on examination of small numbers of specimens (Collins 1990). One way to increase sample sizes is to make quantitative counts of neossoptiles on living nestlings in the field on an opportunistic basis, or as part of other studies when collection of specimens would be disruptive. As part of an ongoing study of natal pterylosis in neotropical passerines (Collins 1973, Collins & Bender 1977, Collins & McDaniel 1989) we present here data on six species of turdine thrushes, with a comparison of counts made from preserved specimens in the lab and living nestlings observed in the field.

Counts of natal downs were made from 13 specimens of four *Turdus* thrushes. In addition, field counts were made from two of these four species of *Turdus* and two other turdine species. All individuals were in early stage A of Wetherbee (1957) with no sign of pin feathers erupting.

Two specimens of Bare-eyed Thrush *Turdus nudigenis* from one nest were collected on 19 July 1964, and six specimens of Cocoa Thrush *T. fumigatus* from two nests were collected on 19 May and 18 July 1964, all in the Arima Valley, Trinidad. Two specimens from one nest of White-throated Thrush *T. albicollis* were collected on 2 July 1972, and three specimens of Pale-breasted Thrush *T. leucomelas* from one nest were collected near Rancho Grande, Estado Aragua, Venezuela. Specimens were examined under a binocular dissecting microscope and numbers and distribution of downs recorded (Table 1). Field counts for all species were made between April and June 1972 near Rancho Grande on newly hatched chicks as part of a study of growth rates (see Ricklefs 1976: 206–7). These field counts were made with a hand lens on 16 chicks of Pale-breasted Thrush, two of White-throated Thrush, two of Yellow-legged Thrush *Platycichla flavipes*, and one of Andean solitaire *Myadestes ralloides* (Table 3).

Total neossoptile counts from specimens ranged from 32 to 112 for individual *Turdus* nestlings (Table 1), with an average of 61 for

TABLE 1
Neossoptile counts from specimens of four *Turdus* thrushes

Tract (region)	*Turdus fumigatus* nest 1			*Turdus fumigatus* nest 2			*Turdus albicollis*		*Turdus leucomelas*			*Turdus nudigenis*	
Capital													
(Coronal)	4/4	5/3	4/5	1/2	4/5	1/1	8/11	7/6	5/7	5/5	4/4	4/4	6/6
(Occipital)	2/2	2/2	2/2	2/2	2/2	0/1	4/3	2/2	3/3	2/2	2/2	2/2	3/2
Spinal													
(Mid-dorsal)	9/8	9/8	5/6	0/2	10/10	9/11	8/9	9/9	9/9	10/10	10/10	4/4	3/4
(Interscapular)	0	0	0	0	0	0	1	0	0	0	0	0	0
(Pelvic)	3	3	2	3	3	2	5	4	5	4	4	3	4
Scapular	4/3	5/5	5/5	4/4	2/2	0/3	8/7	7/7	6/6	7/7	7/6	2/4	5/6
(Primary)	10/9	9/9	9/9	0/0	0/0	0/0	9/9	8/7	9/9	9/9	9/9	9/9	9/9
(Secondary)	8/8	3/3	8/8	0/0	0/0	0/0	9/9	1/1	8/9	8/8	9/9	3/6	8/6
Caudal	6/6	6/6	5/4	6/6	6/6	6/6	6/6	6/6	6/6	6/6	6/6	6/6	6/6
Total	86	78	79	32	52	40	112	82	100	98	97	68	83

Note. For tracts with paired rows, numbers are those on right/left sides. For the two unpaired rows, single figures are given.

TABLE 2
Total neossoptile counts in 15 thrushes

Species	Total number of neossoptiles	n	Source
	Tropical zone species		
Turdus albicollis	97	2	This study
T. fumigatus	61	6	This study
T. leucomelas	98	3	This study
T. nudigenis	76	2	This study
	Temperate zone species		
Turdus migratorius	134	9	Wetherbee 1957
T. libonyanus	196	1	Markus 1970
T. olivaceus	292	2	Markus 1970
Myadestes townsendi	110	1	Wetherbee 1957
Hylocichla mustelina	64	1	Wetherbee 1957
Catharus guttatus	77	4	Wetherbee 1957
C. ustulatus	64	3	Wetherbee 1957
C. minima	76	2	Wetherbee 1957
Monticola angolensis	76	1	Markus 1970

Note. The average is given where more than one specimen was examined.

TABLE 3
Neossoptile counts from thrush chicks examined in the field

Tract or region	*Turdus albicollis*		*Platycichla flavipes*		*Myadestes ralloides*	*Turdus leucomelas* (n=16)
Coronal	5/5	5/5	8/10	7/7	12/12	3(0–11)/3(0–10)
Occipital	3/3	2/2	3/3	2/2	4/5	2(1–3)/2(1–3)
Mid-dorsal	10/10	9/9	10/12	9/9	9/9	8(4–11)/8(4–11)
Pelvic	2	3	0	2	0	3(0–6)
Scapular	5/7	6/6	6/6	5/5	8/8	3(0–8)/3(0–8)
Total	50	47	58	48	67	34(10–68)

Note. Conventions for right/left sides as in Table 1. For *T. leucomelas*, the mean (to nearest whole number) and range are given.

T. fumigatus, 97 for *T. albicollis*, 98 for *T. leucomelas*, and 76 for *T. nudigenis*. The average total for *T. fumigatus* was depressed by inclusion of 3 specimens from nest no. 2 which lacked any alar tract neossoptiles. The nestlings from nest no. 1 had an average total of 81 neossoptiles, which is more similar to the total counts for the other three *Turdus* species. These counts are lower than those for three temperate latitude *Turdus* species, but similar to the totals reported for other temperate zone thrushes (Table 2). Lower total neossoptile counts in tropical congeners have previously been noted for some icterids (Collins & Minsky 1982).

Our counts showed reduced alar tract coverts and no remex coverts in any of the *Turdus* species, in contrast to *T. libonyanus* and *T. olivaceus* (Markus 1970) and *T. migratorius* (Wetherbee 1957). One specimen of *T. albicollis* had a single interscapular down, a region only recently described by Collins & Keane (1991) in *Sayornis*. Specimen counts of *T. fumigatus* chicks from the same nest showed greater similarity in the number of neossoptiles per tract, and total neossoptiles, than did chicks from different nests (Table 1). The greatest differences were in the presence or absence of alar tract neossoptiles.

Field counts of neossoptiles on *T. albicollis* and *T. leucomelas* resulted in distinctly lower total counts (Table 3); the average totals, 49 and 34 respectively, were approximately half the totals determined from specimens. These counts were, however, restricted to the longer, more obvious neossoptiles of the head and body. The field counts did not include any of the minute neossoptiles (<2 mm) on the primaries, secondaries and rectrices, if present, and this clearly contributed to the lower totals. Similarly, the total neossoptile counts for *Platycichla flavipes* and *Myadestes ralloides* should be considered low, by perhaps one half, and comparisons with other species must be limited to only those tracts in which downs were detected.

It is possible that more accurate counts could be made in the field if the observer were previously aware of the specific tracts which would be expected to have neossoptiles present, and their lengths. This, in turn, would have to be based on prior examination of specimens of the same or related species. Even so, an accurate field census of the shortest neossoptiles, often less than 1 mm, would be problematical. Accordingly, the most reliable data will continue to come from the examination of specimens, which can also be re-examined when new tracts are discovered.

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An undescribed plumage character of the Irish Coal Tit *Parus ater hibernicus*

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The Irish Coal Tit *Parus ater hibernicus* was separated from the British population *Parus ater britannicus* Sharpe and Dresser, 1871, by Ogilvie-Grant (1910) (as *Parus hibernicus*). The Irish form is distinct in being suffused with yellow on the parts of the plumage that are white in *britannicus* with the nape and cheek patches usually wholly rich yellow, while the scapulars are rather more olive than buff (Cramp & Perrins 1993). There is some degree of intergradation of plumage between the two subspecies, birds from northeastern Ireland (Co. Down) being more or less inseparable from *britannicus*, whilst populations of the latter in southern Wales are yellower than elsewhere in Britain and approach *hibernicus* (Ogilvie-Grant 1910, Snow 1955, Cramp & Perrins 1993). Yapp (1963) analysed the frequency and distribution of these intermediate morphs, concluding that the two subspecies were inseparable, although this view is not widely followed (e.g. Vaurie 1959, Peters 1967, Cramp & Perrins 1993).

An extensive analysis of the plumage and biometry of all European specimens of *Parus ater* in the British Museum (Natural History), Tring, was undertaken in 1990. As part of a study of sexually dimorphic characters in this species, particular detail was paid to the area of blackish feathering of the chin and throat (herein known as the "bib") (King & Griffiths 1994). The range of variation in bib size and colouration deduced from previous handlings of wild-caught *britannicus* was confirmed by initial study of the skins. Five representative individuals of the observed size classes were photographed and used as standards for all subsequent comparisons, whilst the three principal colour types were classed using Smithe (1975) (see figure 1 and table 1 of King & Griffiths 1994). The bib size and colour of 137 *britannicus* and 58 *hibernicus* specimens (from throughout their respective ranges), that had been sexed by dissection, were recorded prior to examination of their labels (unsexed birds or those whose preparation made scoring of bib characters inaccurate were rejected from this analysis). Only individuals that had completed the post-juvenile moult were examined, and all were aged where possible according to the presence or absence of retained juvenile greater secondary coverts (Svensson 1992). In subsequent analyses, however, data for first-years and adults are lumped, as there was no significant age difference in bib characters from museum data (King & Griffiths 1994) and the age ratios of both sexes were similar in the samples from the two subspecies (χ^2 tests).

As has been reported for *britannicus* (Gosler & King 1989, King & Griffiths 1994), there is significant sexual dimorphism in bib size in *hibernicus*, with males generally having larger bibs (Kruskall-Wallis test, $H_1=4.40$, $P=0.036$; Table 1). However, unlike *britannicus*, there is

TABLE 1

Mean bib size and colour scores (± 1 s.e.) for Coal Tits *Parus ater* of two subspecies. Scoring method follows King & Griffiths (1994)

		Bib size	Bib colour	n
P. a. hibernicus	female	2.58 ± 0.186	0.88 ± 0.153	20
	male	3.01 ± 0.111	1.13 ± 0.088	38
P. a. britannicus	female	2.42 ± 0.111	0.69 ± 0.071	54
	male	3.52 ± 0.106	1.36 ± 0.067	83

no significant sexual difference in bib colour (H_1=2.49, P=0.115; Table 1). Somewhat unexpectedly, it was readily apparent whilst handling specimens of *hibernicus* that their bibs tended to be smaller and paler than those of *britannicus*. These differences were only significant when comparing males of the two subspecies (bib size, H_1=12.67, P<0.001; bib colour, H_1=4.88, P=0.027), and indeed females of *hibernicus* actually tended to have larger, darker bibs than female *britannicus*, though not significantly so (Kruskall-Wallis tests; Table 1).

Thus, the blackish bib feathering is significantly less extensive and rather browner in colour in male *hibernicus* than in male *britannicus*, a subspecific character previously not reported. As no such difference exists between females, the degree of sexual dimorphism of these characters is reduced in *hibernicus*. One consequence of this is greater difficulty in sexing Irish Coal Tits on plumage (pers. obs., specimens; A. G. Gosler, wild-trapped birds). As the bib patch is frequently used for signalling in antagonistic 'head-up' posturing (Hinde 1952, pers. obs.), the biological significance of the differences in bib characters between these (and other) subspecies warrants further research.

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Notes on the nests and eggs of some birds at the Crater Mountain Research Station, Papua New Guinea

by Andrew L. Mack

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The avifauna of Papuasia is highly endemic, 54% of its species being confined to the region (Coates 1985, 1990). Many New Guinea species remain poorly known due to the rugged inaccessibility of many regions and relatively few ornithologists working there. The nest and/or eggs of roughly 50% of New Guinea's endemic bird species have not been described. Furthermore, 13% of the non-endemic species occurring in Papua New Guinea have their nests and eggs described from elsewhere, but not in Papua New Guinea (Coates 1985, 1990).

This paper provides data on the previously undescribed nests and/or eggs of ten Papuan species and observations at nests of an additional six species. Nests and eggs of another 22 species were found during the study (Appendix), but these are not described here as my observations closely matched previous accounts.

These observations were made in the proposed Crater Mountain Wildlife Management Area in the vicinity of the Crater Mountain Biological Research Station (06°43′S, 145°05′E) roughly 10 km east of Haia, Chimbu Province, Papua New Guinea. The study area is rugged hill forest spanning an altitudinal range of 850–1300 m a.s.l. in the headwaters of the Pio-Purari drainage. The vegetation is diverse with no markedly dominant species, ranging from mixed evergreen hill forest to sub-montane forest (Paijmans 1976). There are some abandoned gardens in the study area, from 10 to 50 years old, that form a mosaic of variously-aged second growth. These small plots are largely confined to level ground close to watercourses, and most forest away from the river shows little or no sign of recent human disturbance. Annual rainfall during the study period was 600–700 cm with no pronounced wet and dry season.

Fieldwork was conducted from May 1990 to March 1993 with the exceptions of November–December 1990, January–March 1993 and several 1–2 week absences. These are incidental observations made during the study of the Dwarf Cassowary *Casuarius bennetti*, observations of other birds and their nests being made as time allowed. Given the paucity of published field observation of Papuan birds, incidental observations such as these can make a significant addition to the ornithology of this unique region.

Species accounts

In all cases (save *Corvus tristis*) the attending adult birds were carefully observed. An asterisk before a species name indicates that the nest and/or egg have not been previously described (Coates 1985, 1990). The Appendix lists the additional species found nesting at the station. The nomenclature follows Beehler *et al.* (1986).

GREAT CUCKOO-DOVE *Reinwardtoena reinwardtii*

A nest was found 26 July 1990 in the whorl of a monopodial *Pandanus* sp. (Pandanaceae) tree *c.* 12 m above ground. The nest was more substantial than most columbid nests, being made of fine twigs and slightly raised at the edges to form a shallow bowl. The single egg was uniform white with slight brownish tinge.

ORNATE FRUIT-DOVE *Ptilinopus ornatus**

A nest found 8 October 1992 was in a dense vine tangle in an understory tree that was bent over so that its crown was nearly horizontal. The nest was a typical *Ptilinopus* scanty platform of a few twigs 3 m above ground. No egg was visible.

SULPHUR-CRESTED COCKATOO *Cacatua galerita*

A presumed nest cavity was found in a tall *Aglaia* sp. (Meliaceae) tree in mid-June 1992. Two birds were in attendance during several of my visits until early August, after which they were not seen. The opening was where a branch had snapped off the straight bole *c.* 18 m above ground. The birds apparently pruned hundreds of leaves, twigs, immature fruits, and branches up to 8 cm in diameter from the tree's canopy, making the crown markedly more open. Perhaps this might have made it more difficult for nest-robbers to approach the nest, or warmed the nest chamber by increasing the amount of sunlight reaching it.

VULTURINE PARROT *Psittrichas fulgidus**

A nest found 26 August 1991 was in a cavity 12 m above ground in a large (*c.* 70 cm DBH) dead tree. The cavity entrance was partially concealed by a climbing aroid (Araceae) and a *Freycinetia* sp. (Pandanaceae) climber. On 27 August the female remained in the nest hole, presumably incubating, for 4 hours, after which she came out and was fed by the male. On 9 November the female was observed visiting the hole repeatedly, presumably to feed the chick(s). Thus, the egg-laying to fledging time was at least 76 days. In 1992 the nest tree fell and I examined it. The cavity was excavated in the rotted heartwood to *c.* 1.2 m deep. The bottom of the cavity was deeply layered (*c*. 20 cm) with small bits of wood that appeared to have been shredded from the cavity interior.

STOUT-BILLED CUCKOO-SHRIKE *Coracina caeruleogrisea**

On 13 November 1991 a nest under construction was found; a bird was seen bringing spider webs to the nest and shaping the bowl with its chest. In 18 November a single egg was on the nest but seven days later the nest and egg were gone. The nest was 8 m up in an understory tree that leaned over a wooded precipice. The nest was a very shallow cup (almost a platform) made of fine, dry, plant fibres built atop a horizontal main stem, not enclosing it. Spiders' webs were loosely plastered on the outside of the nest and around the rim. The single egg was a lustrous pale grey with a strong olive cast, marked with dark rufous-brown splotches and flecks forming a ring toward the broad end of the egg with fewer flecks scattered toward the ends.

A second nest was found 9 December 1991, situated like the first in a small tree leaning over a very steep ridge-side, *c*. 20 m above ground. This nest was smaller and concealed by epiphytes. The male and female took turns incubating, essentially covering the small nest so it looked like a bird perched on a horizontal branch.

GREY-GREEN SCRUB-WREN *Sericornis arfakianus**

A nest under construction 17 May 1991 was a domed mass of mosses with a side entrance, roughly 15 cm tall, enclosing the base of a small sapling. The entrance hole was 12 cm above ground. Dry bamboo leaves lined the interior and a few poked out of the entrance. Two individuals were observed nest-building. The nest was empty and unattended on a return visit.

YELLOW-BREASTED BOATBILL *Machaerirhynchus flaviventer*

A nest was found on 18 September 1992, *c*. 9 m above ground in the fork of an understory tree (Rubiaceae). It was a sparse (external dimensions [cm] 6.3 length × 5.3 width) basket of dry plant fibres and stems bound together with spider webs. The bottom of the nest was thin, allowing light through. Eleven days later the nest was abandoned.

CRESTED PITOHUI *Pitohui cristatus**

On 27 November 1992 a nest was found, containing two eggs, 1.8 m above ground in the whorl of a monopodial *Pandanus* sp. tree. The nest was a cup 14 cm deep, the outside made of twigs and dead leaves and the inside of the cup of finer, more tightly interlaced tendrils, vines, and epiphyte rootlets. The rim of the nest was lightly dotted with live mosses. The two eggs were oblong, measuring 33.9 × 22.8 and 32.0 × 22.4 mm. The egg was bright white with irregularly spaced dark grey, black and a few pale grey flecks, somewhat denser toward the broad end; on the broad end was a small cap of grey and black splotches and a few fine, black squiggly lines.

DWARF HONEYEATER *Oedistoma iliolophus*

Although several nests have been described (Coates 1990), one found in October 1992 was unusually situated. It was enclosed in the semicircular base of a fallen *Pandanus* leaf hanging in understory vegetation 60 cm above ground. Eggs from two nests at Crater Mountain (20.4 × 14.3 and 20.5 × 14.1 mm) closely match the description and measurements given for *O. i. fergussonis* in Coates (1990).

SPOT-BREASTED MELIPHAGA *Meliphaga mimikae**

A nest was found on 13 March and another on 25 April 1991, both in the forks of horizontal branches in understory trees 1.7 and 2.0 m above ground. The nests were slightly oblong open cups (external dimensions [cm] 9.0 × 7.5 × 7.5 height; internal 5.0 × 4.5 × 4.5 depth) made of fine plant fibres, twigs and vines thickly covered on the outside by living mosses and ferns. The insides of the cups were thickly layered with loose, shredded, fluffy, light-brown plant down that partially concealed the eggs when not being incubated. Both nests contained two eggs when found. Eggs were light salmon with a sparse ring of rust-coloured flecks toward the broad end and lightly flecked with rust over the remainder of the eggs. One egg measured 23.7 × 16.4 mm.

MOUNTAIN MELIPHAGA *Meliphaga orientalis**

A nest was found on 11 May *c.* 2 m above ground in a horizontal fork. The nest was similar to that of *M. mimikae*, but somewhat smaller (external dimensions all 7.5 cm), and more tightly constructed. The internal dimensions were 5.5 × 4.5 × 4.5 depth, and it was lined with plant-down identical to that found in the *M. mimikae* nests. The outside of the nest was covered with live mosses and dead bamboo leaves. One egg was almost pure white with a few very small indistinct flecks of pale red-brown, while the other was more heavily flecked, particularly toward the broad end. By 13 May both eggs hatched and by 19 May the nest was empty.

OBSCURE HONEYEATER *Lichenostomus obscurus*

A nest with two eggs was found on 17 October 1992 that resembled previously described nests (Coates 1990). However, this nest was tilted to one side with the rim built-up on the higher side to form a partial dome covering almost one quarter of the cup. The eggs measured 22.5 × 16.5 and 23.1 × 16.5 mm.

STREAK-HEADED MANNIKIN *Lonchura tristissima*

A nest was observed under construction 9–11 April 1992 with at least two birds working on it. The nest, a globular mass of bamboo leaves and fine stems, was *c.* 5 m up in dense foliage of an understory tree at the edge of a clearing by a ravine.

MOUNTAIN DRONGO *Chaetorhynchus papuensis**

A nest found on 20 October 1992 was *c.* 4 m above ground in a branch fork of an understory tree. It was a tidy, round, shallow cup of tightly constructed light brown vines and plant fibres. The lower two-thirds of the cup exterior was thinly covered with live mosses; the upper one-third was unadorned. One egg measuring 26.2 × 17.6 mm was being incubated; base colour light brown, heavily flecked with dull rufous marks. Denser flecks formed a ring toward the broad end and a nearly solid cap on the broad end. On 24 October the nest and egg were gone.

TORRENT-LARK *Grallina bruijni**

On 21 November 1991 a cup nest was found with the male incubating a single egg. The nest was hanging from a fork in a *Ficus* sp. (Moraceae) branch 1.5 m over a river. External nest diameter was 9.5, depth 7.7 cm; cup diameter 6.8, depth 3.0 cm. The nest interior was made of fine black plant stems and epiphyte roots; the exterior was covered with a thick layer of mud. The egg measured 24.6 × 18.3 mm; it was white with pale rust flecks, a few toward the narrow end with more, longer and wider flecks toward the broad end. On 7 December a 1–2 day old chick was in the nest; thus incubation time was at least 16 days. Skin of the naked chick was black, matched by the colour of the nest lining.

GREY CROW *Corvus tristis**

Little is known of the nesting of this species (Goodwin 1986). A large nest (roughly 80 cm external diameter) that was an untidy mass of large sticks was found high in an emergent tree (*Aglaia* sp.) in late May 1992. My local assistants assured me it was the nest of this species and agitated Grey Crows were seen in the immediate vicinity, but none were seen actually going to the nest.

Concluding remarks

A variety of birds place their nests in the leaf whorls of *Pandanus* trees. I observed six species commonly nesting in pandans at the Crater Mountain Station (see Appendix). Pandans, with their thorny stems and sharply pointed serrated leaves, are probably difficult for some predators to climb and manoeuvre in. The nests I found were cryptic because they resembled the detritus that typically collects in the whorls at the leaf bases. However, these sites might have drawbacks; nest-robbing birds such as the Greater Black Coucal *Centropus menbeki* and Black Butcherbird *Cracticus quoyi* actively search *Pandanus* whorls for prey (pers. obs.). Because the seven species of *Pandanus* in the study area are quite numerous, many nests probably go undetected by predators that search pandans.

Papua New Guinea still has vast tracts of relatively undisturbed rainforest, offering the opportunity to study rainforest birds under normal (unmodified) conditions—an opportunity that is becoming rare in many regions of the tropics. However, few field studies have been made of most New Guinean birds. This paper describes many novelties observed only incidentally while undertaking other field studies. Hopefully it shows how much more could readily be learned through concentrated studies of the nesting biology of New Guinea's birds and will stimulate interest in this neglected region.

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APPENDIX

Species observed nesting at the Crater Mountain Biological Research Station. P indicates species found nesting in *Pandanus* trees (see text).

Common Scrubfowl *Megapodius freycinet*, Brown Cuckoo-Dove *Macropygia amboinensis* P, Great Cuckoo-Dove *Reinwardtoena reinwardtii* P, Pheasant Pigeon *Otidiphaps nobilis*, Ornate Fruit-Dove *Ptilinopus ornatus*, Superb Fruit-Dove *Ptilinopus superbus*, Beautiful Fruit-Dove *Ptilinopus pulchellus*, Red-flanked Lorikeet *Charmosyna placentis*, Sulphur-crested Cockatoo *Cacatua galerita*, Large Fig-Parrot *Psittaculirostris desmarestii*, Eclectus Parrot *Eclectus roratus*, Vulturine Parrot *Psittrichas fulgidus*, Hook-billed Kingfisher *Melidora macrorrhina*, Stout-billed Cuckoo-shrike *Coracina caeruleogrisea*, Grey-green Scrub-wren *Sericornis arfakianus*, Chestnut-bellied Fantail *Rhipidura hyperythra*, Black-winged Monarch *Monarcha frater*, Spot-winged Monarch *Monarcha guttula*, Yellow-breasted Boatbill *Machaerirhynchus flaviventer*, White-eyed Robin *Pachycephalopsis poliosoma*, Little Shrike-thrush *Colluricincla megarhyncha* P, Rusty Pitohui *Pitohui ferrugineus*, Crested Pitohui *Pitohui cristatus* P, Black Berrypecker *Melanocharis nigra*, Long-billed Honeyeater *Melilestes megarhynchus*, Slaty-chinned Longbill *Toxorhamphus poliopterus*, Dwarf Honeyeater *Oedistoma iliolophus*, Spot-breasted Meliphaga *Meliphaga mimikae*, Mountain Meliphaga *Meliphaga orientalis*, Obscure Honeyeater *Lichenostomus obscurus*, Streak-headed Mannikin *Lonchura tristissima*, Mountain Drongo *Chaetorhynchus papuensis*, Torrent-lark *Grallina bruijni*, Mountain Peltops *Peltops montanus*, White-eared Catbird *Ailuroedus buccoides* P, Magnificent Bird of Paradise *Cicinnurus magnificus* P, Grey Crow *Corvus tristis*.

Discovery of nests and an egg of Loria's Bird of Paradise *Cnemophilus (Loria) loriae* (Paradisaeidae)

by *Clifford B. Frith & Dawn W. Frith*

Received 3 August 1993

Introduction

Loria's Bird of Paradise *Cnemophilus (Loria) loriae* is a small (22 cm, 80–100 g) and stocky sexually dimorphic fruit-eating bird of paradise (Paradisaeidae) discovered in 1893. It lives in mid-montane wet forests of the central mountain ranges of New Guinea from the Weyland Mountains of Irian Jaya eastward to the southern Owen Stanley Range of Papua New Guinea, at 1200–3000, mostly 1800–2400, m asl (Cooper & Forshaw 1977, Beehler *et al.* 1986, Coates 1990).

Adult males are glossy velvety-black with iridescent blue-green lores and forehead, a slight purple gloss on upperparts and iridescent blue-green or violet-purple sheens on the inner secondaries. The bill is black, and the obvious fleshy gape and inside mouth are cream yellow, white or pale green. Adult females are uniform yellowish-olive or dull greenish-olive (Coates 1990). Immature males have the plumage of adult females, and a distinct grey juvenile plumage is known (Frith 1987).

Little else has been learnt about this taxonomically interesting bird of paradise, one of three species constituting the distinct subfamily Cnemophilinae. Bock (1963) showed Loria's Bird to be most closely related to the other monotypic cnemophilines, the Crested Bird of Paradise *Cnemophilus macgregorii* (hereafter Crested Bird), and the Yellow-breasted Bird of Paradise *Loboparadisea sericea*. Clench (1992) concluded that Macgregor's Bird of Paradise *Macgregoria pulchra*, presently placed in Paradisaeinae (Gilliard 1969, Cooper & Forshaw 1977), should be in the Cnemophilinae.

Diamond (1972) suggested that *Loria* be merged with *Cnemophilus* and Schodde (1976) suggested that *Loboparadisaea* might also be merged with *Cnemophilus*. Some subsequent authors have placed only *Loria* into *Cnemophilus* (Beehler & Finch 1985, Beehler *et al.* 1986), while Frith (1987) and Frith & Harrison (1989) considered this reasonable but preferred to retain *Loria* until kowledge of living birds was available. Frith (1987) stressed the need for knowledge of nidification in Loria's Bird of Paradise (hereafter Loria's Bird) to further understand relationships within the Cnemophilinae, and Paradisaeidae as a whole.

Loria's Bird is assumed to be polygynous, as solitary adult males are known to attend conspicuous forest canopy calling-perches and to advertise their location with regularly repeated, ventriloquial bell-like notes (Gilliard 1969, Coates 1990). Lone individuals and aggregations of up to ten female-plumaged birds have been recorded feeding upon fruits (thought to be the exclusive diet) of several plant species from the ground to the forest canopy, but mostly low in the forest (Cooper & Forshaw 1977, Coates 1990). Majnep (in Majnep & Bulmer 1977) suggested that both female and male attend a domed nest when nestlings are present, but no nest or egg has been formally described. The only indication of breeding in the species is Ripley's (1964) record of two "juveniles, one unsexed, not long out of the nest" in the Ilaga Valley in the Snow Mountains of Irian Jaya in September.

Discovery of the nests

Having discovered a number of nests and eggs of several bird of paradise species in the Tari Gap and Ambua Lodge areas of the Southern Highlands of Papua New Guinea (Frith & Frith 1990, 1992a, 1993b,c) we returned to Ambua Lodge for the period 15 December–27 January 1993 specifically to attempt to find a nest of Loria's Bird, which is not uncommon there (Frith & Frith 1992b, 1993a). Several domed nests of the congeneric Crested Bird found within several metres of the ground (Frith & Frith 1993c) led us to anticipate a domed nest built close to the ground by Loria's Bird. In the event we found six nests.

Nest 1

Joseph Thavo, naturalist at Ambua Lodge, told us of seeing a female-plumaged Loria's Bird carrying nest-material on a number of occasions over a period of a week or more some six to eight weeks previously. We visited the location with Thavo on 17 December and there flushed a female-plumaged Loria's Bird from near the ground, and subsequently found a used nest (nest 1) built upon a near-vertical exposed rock face (Plate 1). The nest site was in mature mossy forest *c.* 50 m from and 15 m above a 15 m wide boulder-strewn swift-flowing mountain torrent, on a 45° slope falling to the SSE. A small rock overhang directly above the nest protected the site and kept the nest dry. The face of exposed rock extended some 2 m vertically above the nest site.

Within this nest were numerous egg fragments, the largest measuring 13.8 × 12.0 mm, indicating an egg of pinkish-buff ground colour with numerous brown, russet and purplish-grey spots and blotches over most of the surface but conspicuously more dense on the larger end. The egg had only slight gloss and no broad longitudinal blotches or streakings as are typical of eggs of most members of the Paradisaeinae.

The nest was roughly globular, but vertically flattish and sparse at the back where hard against the rock, with a horizontally-ovate entrance hole in the front. The external structure was a substantial accumulation of green mosses heavily 'decorated' or 'camouflaged' on the front half of the top and around the sides, down to the mid-entrance-hole level, with 40 (now dried and shrivelled) filmy fern fronds (*Hymenophyllum* spp.) most numerous directly above, and overhanging, the entrance. Incorporated into the moss of the entrance perch and below it were *c.* 30 sticks up to 235 mm long and 4.5 (mostly

TABLE 1

Direction entrance faced (in compass degrees), height and measurements (mm), as indicated in Figure 1, of five Loria's Bird of Paradise nests; with means for five Crested Birds' nests

Nest no.	Nest entrance faced	Height above ground	a	b	c	d	e	f	g	h	i	j
1	140	600	275	250	130	110	90	110	155	130	100	30
2	210	2100	280	265	—	112	65	178	190	110	—	24
3	20	1650	230	200	126	95	76	98	212	122	110	41
4	40	2000	220	220	—	85	70	70	175	112	—	27
5	315	1500	193	—	—	105	85	94	160	122	—	23
Means												
Loria's	145	1580	240	234	128	101	77	110	178	119	105	29
Crested	—	2609	207	197	107	122	74	—	175	126	123	45

2–3) mm in diameter, a part of some being visible. Two live epiphytic orchid stems were incorporated into the moss beneath the entrance perch (Plates 1 and 2).

The inner nest-chamber lining consisted of a discrete frail 'basket' of pale, supple, fine (<1 mm diameter) epiphytic orchid stems, and a few fine vine tendrils up to 400 mm long (Plate 2). Many of the longer orchid stems of this inner 'basket' encircled the entire inside or outside of its globular shape. The base of the 'basket' was thicker and denser, many of the orchid stems lining the egg-cup being shorter in length than elsewhere. There was no egg-cup lining material different to the rest of the lining. No tree leaves or 'comb-tooth' fern fronds were used in this nest, measurements of which appear in Table 1 and are indicated in Figure 1.

Nest 2

Following the finding of nest 1 all saplings, trees and rock faces in an immediate area of 2 km^2 at altitudes of *c.* 2150 to 2200 m were searched for nests. On 18 December recently used nest 2, with a female-plumaged Loria's Bird scolding close by, was found in similar habitat and some 500 m downstream on the same torrent (Fig. 2). This nest was built upon the side of a moss-covered, 40 cm diameter, tree trunk and was extremely cryptic (Plate 2). The nest tree was 55 m from and 18 m above the torrent on a *c.* 40° slope falling to the W. To confirm the status of this nest a fresh leaf was placed within its egg cup, which remained there until 6 January when the nest was collected and measured (Table 1). Nest materials were similar to those of nest 1, but there was a much more substantial moss base and *c.* 110 sticks up to 280 mm long and 3 (a few to 4.5) mm in diameter beneath the entrance perch. This base could have included material from a previous nest, but it may have been required to provide purchase on the vertical tree

Plate 1. Nest of Loria's Bird of Paradise. Upper, nest 1 *in situ*, the arrow to the right of the nest pointing to the entrance perch level below the entrance aperture. Lower, nest 1 detail.

Plate 2 (overleaf). Nests of Loria's Bird of Paradise. Upper, the chamber lining 'basket' removed from nest 1. Lower, nest 2 *in situ* on tree trunk, the index finger-tip of M. Media's left hand being at the entrance aperture.

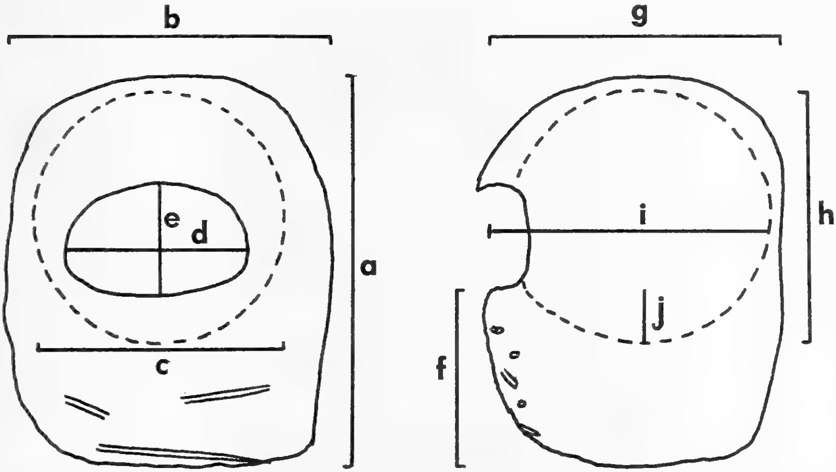

Figure 1. Schematic front (left) and side (right) profile of a Loria's Bird of Paradise domed nest to show parameters measured, and presented in Table 1: a=nest height; b=nest width; c=nest chamber width; d=entrance aperture width, and e=its depth; f=height to entrance perch; g=nest depth; h=nest chamber height, and i=its depth; j=egg-cup depth from entrance perch level.

trunk, there being no epiphytic plants or other structures to support it. Unlike nest 1, the nest base had a few tree leaves and leaf pieces incorporated into it. The entire inner nest-lining 'basket' consisted of the supple straw-coloured stems of epiphytic orchids up to 550 mm long and 1.5 mm in diameter, with a few black tendril-like rootlets or stems up to 760 mm long.

Nest 3

This nest was found on 21 December under construction, being built of moss and filmy fern fronds, but lacking a chamber lining of orchid stems. A silent female-plumaged Loria's Bird watched us at this nest. The nest was *c.* 200 m from nest 1 on a bearing of 130°, on the opposite side of the same stream (Fig. 2) in mature moss forest on a 45–50° slope falling to the NNE. This nest was extremely cryptic *in situ*, its materials perfectly matching living plants growing on immediately adjacent rock faces. When complete, nest materials were similar to nest 1 but the external appearance was dominated by fresh deep-green and blue-green filmy fern fronds (*Hymenophyllum* spp.) rather than by moss. Several fern fronds were placed below the entrance perch. Some 33 straight sticks, up to 305 mm long and 5.5 mm in diameter, were in part or entirely visible on and in the front of the nest below the entrance perch. The inner nest-lining was predominantly of supple straw-coloured orchid stems, with several other fine woody tendrils, up to 600 mm long and 1.8 mm in diameter. The base of the nest was a most substantial accumulation of filmy ferns laid atop one another to form a dense and

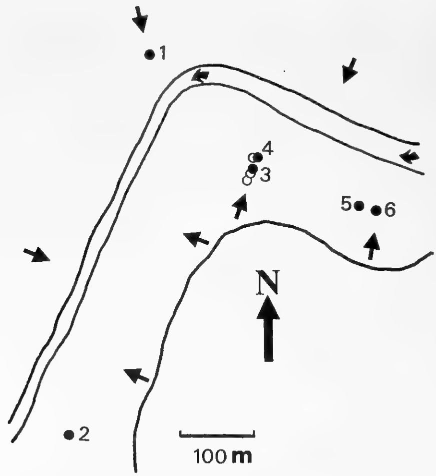

Figure 2. Schematic map of Loria's Bird of Paradise nest locations, to scale. Numbered solid circles are nests examined and open circles are older, disused, nests. Parallel lines indicate a mountain torrent, flowing from top to bottom as arrowed. Single contour line shows ridge top, and arrows indicate steep fall of forested terrain toward torrent.

compacted wad intersected by the sticks. No comb-tooth fern fronds were present.

On 22, 24, 28, 29, 30 December 1992 and at 1130 hrs on 1 January 1993 a female-plumaged Loria's Bird was seen adding materials to the nest, which was empty. At 1420 h on 2 January the bird was flushed from a fresh elliptical ovate egg measuring 36.8 × 24.5 mm and weighing 11.3 g. This slightly-glossed egg was pale pink-buff sparsely spotted and blotched all over with russet, rufous, tan-browns and purple-greys. These markings, and fine short scribblings, were more dense in a band close to and about the larger end (Fig. 3).

The nest was inspected once a day until 23 January and on each occasion a female-plumaged bird was flushed or was in the immediate nest area showing concern. It was heard to give only a soft, low rasping scold note repeated 4–5 times. At 1430 hrs on the 24th the egg showed no sign of pipping. At 0900 hrs on the 25th the bird flushed off the egg, now 10.5 g and with one small shell eruption at its larger end. At 1700 hrs on the 26th the bird again flushed off the pipping egg, and at 0730 on the 27th off a naked hatchling. Thus the egg hatched on the 26th day after laying, assuming it was laid sometime before 1430 hrs on 2 January. The hatchling was mid blue-grey dorsally and on its legs, eyes and forecrown; the ventral body, crown and nape were paler and a yellowish-fawn, the bill brownish-grey with a tiny white egg-tooth, the gape white, and claws conspicuously white. The nestling was found dead and cold with head wounds late the next day; it was preserved in alcohol and subsequently deposited in the Papua New Guinea National Museum collection in Port Moresby.

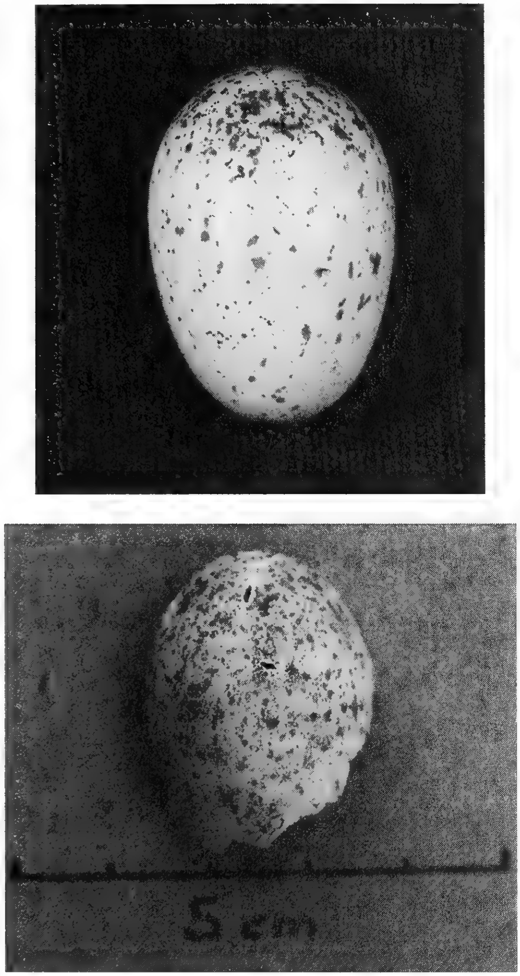

Figure 3. Egg and egg fragment of Loria's Bird of Paradise. Upper, freshly laid egg of nest 3; lower, egg fragment of nest 5.

When collected for examination, nest 3 was found to be built directly upon an older nest structure, with yet another old nest immediately behind and above it on the same rock (Fig. 2).

Nest 4

This nest was found on 21 December, 10 m directly downslope from nest 3. Clearly a nest of the previous season, it was extremely cryptic *in situ*. It was built atop a plant-covered rocky protuberance at the top of an exposed rock face lacking protective rock directly above. The nest was built of similar materials to the previous ones, having some 30 sticks incorporated into the base, including a couple of large orchid stems up to 450 mm long and 5 (mostly 3–4) mm in diameter. One 'stick' was a 290 mm length of heavily-hooked *Calamus* palm stem. Also within the basal stick and moss material were several dead, dry *Nastus* bamboo leaves. Filmy fern fronds used to 'decorate' or 'camouflage' the nest exterior consisted of at least four species. A tooth-comb-like fern frond, possibly *Doodia* or a related genus, was placed above the entrance hole and three more were incorporated into the upper nest material but were not visible externally. Only 30 cm from and above this nest on the same rock, were the remains of an older nest, too deteriorated to be measured.

Nest 5

On 22 December nest 5 was found, *c.* 150 m upstream from nest 3 on the same stream bank. This nest was built upon a rock face, with rock directly above protruding over the nest just far enough to protect it from rain. Rocks immediately about this nest were lushly vegetated with mosses and filmy ferns so similar to the external nest materials that the structure was almost impossible to discern, even with knowledge of its location. This nest was 45 m above the stream and *c.* 65 m from its bank, on a well moss-forested wet rocky north-facing 55° slope that fell from the ridge top some 40 m above the nest site all the way to the stream. The whole area, of this and all the other nests between the ridge-top and the torrent (Fig. 2), was so steep, wet and unstable that it would be rarely traversed by people.

The nest contained a holed egg fragment measuring 29 × 23 mm (Fig. 3) and seven smaller ones, up to 9 × 7 mm, of a pink-buff ground colour spotted and blotched with numerous markings of browns, tans and purplish-greys, most densely on the broad end. The fragments lacked gloss, possibly due to weathering as nest 5 was at least one year old.

The nest contained only a couple of sticks within and beneath its base, up to 142 mm long and 3 mm in diameter. It was generally of similar materials to the others. Numerous filmy fern fronds were atop the structure, hanging over the entrance hole, and a few also on the upper sides. Conspicuously placed atop the nest were several 'comb-tooth' fern fronds and more of these were found beneath the moss of the upper structure. There was a substantial number of filmy fern fronds above the base moss material, with a couple of 'comb-tooth' fern fronds (*Ctenopteris* sp.) directly beneath the egg-cup lining of supple epiphytic orchid stems. The latter were up to 450 mm long and 0.5–1.5 (mostly 1) mm in diameter, plus a few fine supple black root tendrils. The lining of the central egg cup was of orchid stem lengths of only 100–150 mm.

Nest 6

This, probably a recently used nest of the season, was *c.* 25 m from nest 5 on the same level of the same slope, in a similar site on a moss and filmy fern-covered rock face directly beneath a small projecting rock-ledge overhang. The nest was so well integrated into the rock face and vegetation that it could not be removed without its destruction. It was 1.2 m above ground and the entrance faced N.

Statistical summary of nests

The height above ground, direction the nest entrance faced, and measurements of nests 1–5 are summarised in Table 1, the measurements taken being indicated in Figure 1.

Discussion

Although Loria's Bird is approximately 10% smaller than the Crested Bird, the external dimensions of its nest (Fig. 1a,b,c,g) were larger; its nest entrance aperture and other internal dimensions were smaller or similar (Fig. 1d,e,h,i,j); see Table 1. Whilst the Crested Bird is known to build a nest on a tree stump, trunk or branches (Frith & Frith 1993c), it would appear that, in the area studied, Loria's Bird specializes in nesting on lushly-vegetated near-vertical rock faces on steep slopes of deeply dissected mountain torrent valleys, notwithstanding one nest on a tree trunk. Six Loria's Bird nests were at a mean of 1.5 m above ground, 1 m lower than five Crested Bird nests (Frith & Frith 1993c).

Loria's nest is almost identical in shape, construction and materials to that of the congeneric Crested Bird except that the egg-cup is not lined with distinctly finer orchid stems (Frith & Frith 1993c) but with shorter lengths of the same orchid stems that constitute the entire inner nest lining (Plate 2). Nine Loria's and five Crested Bird nests suggest that the former tends to use more filmy fern and the latter more 'comb-tooth' fronds, whilst both utilize much moss, orchid stems and sticks. Samples are, however, small and from a single area for each species.

The nest of Loria's Bird, and that of the Crested Bird, is unlike all other known bird of paradise nests in being a globular domed structure incorporating woody sticks as a foundation (Gilliard 1969, Cooper & Forshaw 1977, Coats 1990, Frith & Frith 1990a, 1992a, 1993b,c). Sticks in the Loria's Bird nests we studied were all within the moss and ferns beneath the entrance perch, none being fully exposed beneath this as in the Crested Bird's nest.

The use of nest 'foundation' sticks by both *Cnemophilus* species is particularly noteworthy. All other bird of paradise nests known (26 paradisaeine species) are open shallow cups of orchid and/or vine stems or tendrils with or without some moss, fern fronds or leaves (Gilliard 1969, Cooper & Forshaw 1977, Coates 1990, Frith 1991, Frith & Frith 1990a, 1992a, 1993b,c); twigs or sticks have not been convincingly documented as used by most species.

The Crested Bird egg fragments described by Frith & Frith (1993c) indicate an egg of similar colour and markings to that of Loria's Bird. The hatchling of Loria's Bird is naked and predominantly dark-skinned, as is characteristic of the Crested Bird and all other birds of paradise, in contrast to pale-skinned, conspicuously downy, bowerbird hatchlings (Ptilonorhynchidae), as discussed elsewhere (Frith & Frith 1990b, 1993b,c, 1994). Studies of successfully nesting Loria's Birds are required to clarify if its grey plumage (Frith 1987) is in fact a briefly-worn juvenile plumage common to all populations of the species, notwithstanding Ripley's (1964) report of two "juveniles" in typical adult female plumage. We take this opportunity to document that the bird photographed by Peckover (1990: 6, plate 5) and claimed to be a Loria's Bird in immature male plumage is in fact a female-plumaged Yellow-breasted Bird of Paradise.

Our numerous nest visits during the entire incubation period at nest 3 always involved disturbing a female-plumaged Loria's Bird, which we assume to have been a single female. We doubt that male Loria's Birds visit the nest (Majnep, in Majnep & Bulmer 1977), and consider it probable that females are uniparental at the nest and feed young exclusively fruit, as in the Crested Bird (Frith & Frith 1993c).

The incubation period at nest 3 was 25 days ($\pm$ 1 day), longer than the 16–22 days recorded for other, lowland nesting, birds of paradise (Coates 1990, Worth *et al.* 1991, Frith 1985, 1991) and most passerines (Skutch 1976). This long incubation is probably largely due to its nesting in the cold wet climate of a relatively high altitude (Skutch 1976), as found in other passerines of the area (Frith & Frith 1990b, 1994). The fresh egg weight of 11.3 g represents 12.1% of mean adult female weight (93.3, $n=3$; Diamond 1972) or 12.2% of mean adult weight (92.4, $n=6$; Frith & Frith 1993a).

Figure 2 shows that nest 3 had two old nests immediately adjacent and two more (including nest 4) 10 m away. Nest 5 was 25 m from nest 6. We consider it probable that these represent examples of 'traditional' nesting by female Loria's Birds using the same nest site or immediate area over subsequent seasons, one bird building all nests associated with nest 3 and another both 5 and 6. Such 'traditional' nesting by polygynous birds of paradise and other passerines has been reported and discussed elsewhere (Frith & Frith 1992a, 1993b, 1994).

The finding of a grey juvenile plumage in both Loria's and Crested Birds, together with new information presented here, strongly supports the incorporation of *Loria loriae* into *Cnemophilus* (Diamond 1972, Beehler & Finch 1985, Beehler *et al.* 1986) and the resultant synonomy of *Loria*. Knowledge of living, or the genetics of, monotypic cnemophiline *Loboparadisea sericea* is now eagerly awaited in order to properly assess the validity of *Loboparadisea*.

Diamond (1972) found no altitudinal overlap between Loria's Bird and the Crested Bird. Cooper (in Cooper & Forshaw 1977) found both sympatric, however, and we have recorded both species in forests of the Ambua Lodge to Tari Gap road at altitudes of 2200 to 2650 m (Frith & Frith 1992b, 1993a) but saw no nesting by Loria's Bird at the higher elevations. Diamond (1986) pointed out that numerous inter- and intrageneric hybrids are produced by bird of paradise species in which males are known or suspected to be promiscuous. That none are known to involve the cnemophilines led him to ask if they are monogamous birds. Our observations strongly suggest that female Loria's and the Crested Birds are uniparental nesters, and that males are probably promiscuous. This raises the previously unconsidered possibility of these two birds hybridizing with other birds of paradise or with each other. If, however, the male parent were a paradisaeine species that fed a significant proportion of animal food to its young (Frith & Frith 1992a, 1993b) it is possible that the resultant young might be fed exclusively on fruit and would not survive.

Majnep (in Majep & Bulmer 1977) was correct in stating that Loria's Bird builds a domed nest as does the Lesser Melampitta *Melampitta lugubris* (Frith & Frith 1990b). The nest of the latter differs, however, in lacking sticks in the base and in having a discrete egg-cup lining of horsehair-like plant rootlets. The egg of *M. lugubris* differs from that of both Loria's Bird and the Crested Bird in being chalky-white, in lacking any gloss, in being near-spherical and in having sparser and larger markings (Frith & Frith 1990b, 1993c).

Notwithstanding the suggestion, based on DNA-DNA hybridization studies, that *M. lugubris* is a bird of paradise (Sibley & Ahlquist 1987) and the fact that its pterylosis is similar to some birds of paradise (Clench 1992), significant differences in life history between *M. lugubris* and the Paradisaeidae indicate a need for further studies (Frith & Frith 1990b). Sibley & Ahlquist (1987) considered *M. lugubris* to represent a sister group to, and equidistant from, all paradisaeine birds of paradise (not closest to *Manucodia* as we [Frith & Frith 1990b] erroneously interpreted their results). Whilst *M. lugubris* may be closer to the Paradisaeidae than anyone prior to Sibley & Ahlquist (1987) considered, aspects of its morphology and biology appear too different to justify its inclusion within that family unless conclusive supporting evidence be available. Given that Sibley & Ahlquists' results (1987) indicated to them that *Melampitta* diverged from other birds of paradise earlier (*c.* 20–21 million years ago) than did any other genus of that family, and the gross life history differences we have observed (Frith & Frith 1990b, 1993c), we think it more appropriate to exclude *Melampitta* from the Paradisaeidae at this time.

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Numbers of Red-backed Shrikes *Lanius collurio* in different habitats of South Africa

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Red-backed Shrikes are declining in central Europe, particularly in areas of intensified agriculture. As a first step towards describing the situation of the species in its non-breeding range Bruderer & Bruderer (1993) presented an up-dated distribution map of the species in southern Africa. It was shown that the distribution of Red-backed Shrikes coincides with the Savanna Biome according to Rutherford & Westfall (1986). Within the Savanna Biome the arid savannas (Huntley 1982) are preferred to the moist savannas. A more detailed association of the species' distribution with vegetation units based on Acocks' (1988) *Veld Types of South Africa* showed that Kalahari Thornveld and Arid Lowveld were most preferred. Due to the lack of quantitative information on the species' distribution, the present study aims at rough estimates of densities in order to complement the atlas information for part of the non-breeding range and to compare habitat preferences in different areas as a basis for more detailed studies on the ecology of the species.

Methods

Terminology and general rules. The terms "count, survey, census, strip transect" are used as proposed by Ralph (1981). Specific adaptations are described below. The counts were restricted to the shrikes' main activity periods which were determined by observations on their behaviour (unpubl. data). Red-backed Shrikes in the non-breeding area tend to expose themselves to the sun at sunrise; territorial behaviour and calling are most pronounced at that time. During the following two to three hours foraging has priority. When it becomes warmer after about 10 o'clock, the birds gradually tend to seek shade and are less conspicuous; during the hottest period of the day most are completely hidden. A second phase of activity occurs during the last two hours before sunset, with intense calling at sunset. In cool and overcast weather, the active period may be slightly extended. Birds were mapped on transparent sheets fixed to orthophotos or 1:10 000 maps of the main study areas. Where no such documents were available, distances along the transect line were read from the automatic counter of the car and distances off the line were estimated.

Strip transects by car. To cover large distances, or where leaving the car was not possible (e.g. in the Kruger National Park), counts were done by driving at a speed of about 7 km/h, one observer surveying the left and another one the right side of the road. In open areas or where the bushes were low and well separated, a strip of 50 m on both sides of the road could be surveyed (VW-Combi providing a relatively high observation platform). The car was slowed down or even stopped when the bushes could not be checked adequately at the basic speed. In areas with denser bush (and no possibility of leaving the car) the census strip was reduced to 25 m off the transect line.

Strip transects on foot. In areas with orthophotos or comparable maps, off-road strips could be covered. In areas with dense bush, where leaving the car was possible, car transects were supplemented by two persons walking for a known distance about 25 m off the road in order to achieve a strip width of 50 m to both sides of the road.

Area surveys. 1 km^2 plots at "Deelkraal" and "The Ridge" were covered by a series of strip transects of two observers walking 50-75 m apart. At "Verene" daily driving along the road and frequent walking parallel to the road resulted in a complete census of 15 ha and provided data for detectability estimates.

Detectability of Red-backed Shrikes and density estimates. Good knowledge of the numbers of birds in the census area at "Verene" and of some individuals in other areas allowed tests of the detectability of these individuals when driving past at normal counting speed. Provided that the main parts of these birds' territories were inside the counting strip, the detection rate was about 60% for males in single one-visit counts during the main activity periods. The corresponding detection rate for the more cryptically coloured, and often less conspicuously perching females was about 40%. In the case of our area surveys with two observers, we assumed that the detection rate was slightly higher than in the tests. In unknown areas, such as in the one-visit strip transects by car, where the preferred perches are not familiar to the observer, the detection rate is probably lower, and also depends on habitat structure. In spite of comparability problems (mentioned in text and tables), we transformed the counts of Red-backed Shrikes into densities for rough comparisons between regions and habitats.

Association of vegetation types with Red-backed Shrike distribution. Acocks (1988) has provided South Africa with an excellent set of vegetation maps and with a classification of vegetation types, described by climate, soil characteristics, and plant associations; most of them illustrated by photos. Seventy veld types are included; those relevant for the Red-backed Shrike are listed in Bruderer & Bruderer (1993). The allocation of an area to a certain veld type was based on Acock's (1988) maps. In the main study area, the Transvaal Province, nine veld types were relevant for the Red-backed Shrike (Table 1).

Study areas

Names of sites always refer to the 1:250 000 topographical maps of South Africa. The main study areas (site 1 in Fig. 1), situated 25 km E of Nylstroom around the Nyl Floodplain, were surveyed mainly during December 1989 and February 1990. The area as a whole belongs to the Mixed Bushveld (Acocks 1988, Frost 1987). In fact it is a mosaic of several veld types which can be divided into two main communities: (a) those on the higher parts of the landscape, mainly on well-drained (acidic) sandy soils derived from weathering sandstone and conglomerate, with mainly broad-leaved bushes and trees (e.g. *Ochna pulchra, Terminalia sericea*); (b) the microphyllous thornbush savannas on alluvial clay soils of the bottomlands, which are dominated by *Acacia* spp. The woodlands are interrupted by open areas, such as valleys or old man-made clearings. In spite of having the same climate, the microphyllous woodland shows affinities to the arid savannas, the broad-leaved woodland to the moist savannas (Tarboton 1980). Four plots were selected in order to get an idea of the distribution of shrikes in the different habitats of this area (Table 2): (1) 16 km of strip transects along the vley in the Nylsvley Provincial Nature Reserve (a former farm), with three parts offering a mixture of open grassland, Acacia savanna and broad-leaved savanna; (2) 1 km^2 of partly cleared, cattle-grazed grassland covered with 5 up to 50% of (mainly *Acacia*) bush on the farm "Deelkraal"; (3) 1 km^2 of recolonized grassland on old lands, partly cleared Acacia bush and mixed Bushveld in the farm area "The Ridge"; (4) a 15 ha plot of mixed (mainly broad-leaved) Bushveld on the farm "Verene", where we lived. The sites outside the Nyl area were visited only once, mainly in January 1990 (Table 1). Those within Transvaal Province are indicated in Figure 1.

Densities in different areas

Table 1 is mainly based on one-visit strip transects (two exceptions marked out by a footnote are explained below). Detection rates may be slightly higher in multiple strip transects and considerably higher in the area surveys (Table 2, see below). In spite of these limitations, the two tables show the same general features as the atlas distributions for Transvaal (Bruderer & Bruderer 1993): highest densities occur in the semi-arid savannas of the Lowveld and the Limpopo basin, lower densities in the central parts of northern Transvaal, where on the slightly higher relief broad-leaved savannas prevail. Within the Bushveld there is a decrease from N to S, the low densities at Vaalbosch being recorded in an optimal Red-backed Shrike habitat with open mixed scrub of mainly 1.5 m height. In spite of intensive search and apparently suitable habitats, no Red-backed Shrikes could be found in the well developed bush along the slopes of the Willem Pretorius Game Reserve (Highveld, between Kronstad and Bloemfontein) and in the bush associated with dry riverbeds in the Karoo National Park (Nama-Karoo, near Beaufort West); these are not included in Table 1. In addition to the general trends, Tables 1 and 2 indicate wide variation of densities within the same veld type and within short distances.

TABLE 1

Density estimates of Red-backed Shrikes (to nearest 0.5 birds) and proportion of males in different areas and habitats of Transvaal, based on single one-visit strip transects; arranged according to increasing densities. Veld Types according to Acocks (1988)

Site no. (Fig. 1)	Geographic name of site (Veld Type, Acocks 1988)	Surface and habitat in counting area	Density birds/10 ha	% males[2] Jan	% males[2] Feb/Mar
2	Percy Fife (Sour Bushv.+Sourish Mixed Bushv.)	250 ha mixed bush & woodland, hill	<0.5	50	
9	Phalaborwa-Letaba (Mopani Veld)	200 ha dense, rather low Mopane bush	1	50	
13	Vaalbosch (Turf Thornveld)	80 ha low mixed scrub with many Acacia	1.5		65
8	Punda Maria (Lowveld Sour Bushv.)	200 ha broad-leaved woodland	1.5	55	
11	Klaserie (Arid Lowveld)	80 ha open broad-leaved woodl. Mixed Red-bushwillow/Mopane	2	50	
4	Kranspoort (Sourish Mixed Bushv.)	50 ha broad-leaved woodland & bush	2	60	
3c	Ruigedraai (Mixed Bushveld)	35 ha low, mainly broad-leaved scrub, hill	2		50
5	Venda/Dzanani2 (Sourish Mixed Bushv.)	20 ha overgrazed, secondary Acacia bush	3	65	
3b	Ruigedraai (Mixed Bushveld)	55 ha low mixed scrub, hillfoot	3.5		85
6	Langjaan (Arid Sweet Bv.+Mopani Veld)	90 ha low mixed scrub Acacia/Terminalia prunoides	5	60	
7	Malongavlakte (Mopani Veld)	30 ha overgrazed, secondary Acacia bush	6.5	60	
3a	Ruigedraai (Mixed Bushveld)	70 ha low mixed scrub, plain	6.5		75
8	Punda Maria (Lowveld Sour Bushv.)	15 ha several clearings with Acacia in broadl. woodland	8 [1]	65	
11	Klaserie (Arid Lowveld)	6 ha clearing in broad-leaved woodland	8 [1]	50	
11	Klaserie (Arid Lowveld)	10 km of (low surface) grass strips along roads	(10)	60	
10	Satara (Arid Lowveld)	100 ha open Acacia scrub Knobthorn-Maroela Veld	12	65	
12	Olifants (Arid Lowveld)	100 ha open Acacia scrub Knobthorn-Maroela Veld	15	55	

[1]For censuses on small patches with low bush, detection rates were assumed to be close to 100%. The original figures were reduced by 50% to render them comparable to the one-visit strip transects with an estimated detectability of 50% (see text).

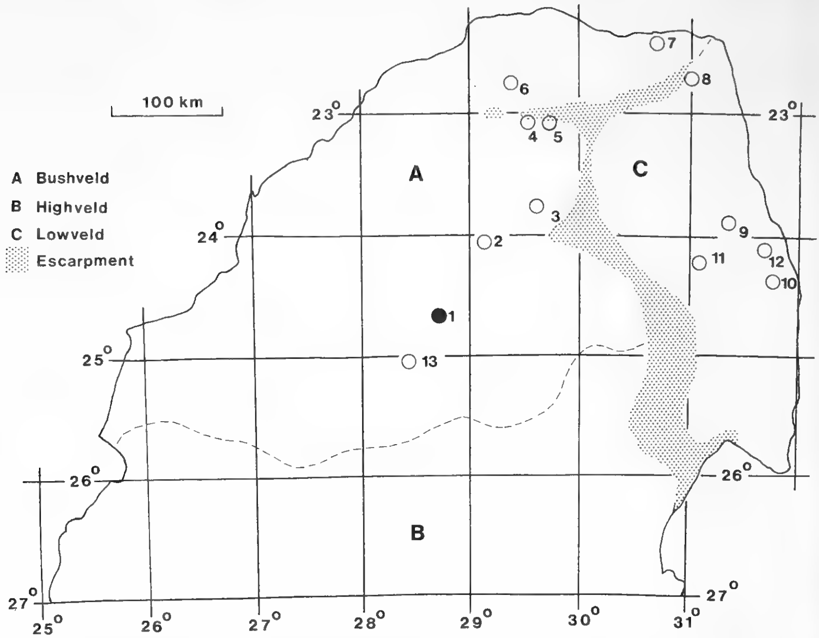

Figure 1. Study areas in Northern Transvaal: 1, Nyl area (main study area; dark point); 2, Transvaal Provincial Nature Reserve Percy Fife; 3, Air force Reserve Corbadraai (former farm Ruigedraai); 4, Kranspoort (road at southern edge of the Soutpansberg); 5, Venda/Dzanani 2 (road at southern edge of the Soutpansberg); 6, Transvaal Provincial Nature Reserve Langjaan; 7, Malongavlakte; 8, Punda Maria; 9, Phalaborwa-Letaba; 10, Satara; 11, private Nature Reserve Klaserie; 12, South of Olifants; 13, farm Vaalbosch. Boundaries between the geographical regions Bushveld, Highveld, and Lowveld dashed. Escarpment shaded.

Variation of densities with habitats

In the geographical area of the Lowland (Fig. 1), densities varied from 1 to 15 birds/10 ha due to important differences in local habitat structure which is far below the resolution of Acocks' (1988) maps. The distribution was particularly patchy in the Klaserie and Punda Maria area (Table 1). Low densities (1–2 birds/10 ha near Punda Maria, about 2 birds/10 ha at Klaserie) were recorded in strip transects in broad-leaved woodland with high trees. High densities occurred on clearings with Acacia. Such small areas with low bush were easily surveyed completely in a relatively short time. The resulting densities (e.g. 10 birds on 6 ha at Klaserie corresponding to 16.6 birds/10 ha, or 2–3 birds on several clearings of 1–3 ha around Punda Maria, corresponding to 7–30 birds/10 ha) are not directly comparable with the normal strip transects. Taking into account that the usual detectability of the birds in one-visit strip transects is about 50%, the densities for these patches (with probably close to 100%

TABLE 2

Density estimates of Red-backed Shrikes and proportion of males in the Nylsvley area (Mixed Bushveld), based on mean values of multiple strip transects (b, c, d) and area surveys (a, e, f). The higher detection rates in the area surveys are accounted for by reducing the census data (provided in brackets) in order to be comparable to strip transects (see text for explanation)

Ref. no.	Site (no. and veld type of Acocks 1988)	Surface and habitat in counting area	Density birds/10 ha	% males Nov/Dec	% males Feb/Mar
1a	The Ridge	100 ha mixed bush & secondary grassland	0.7(1.1)	25	50
1b	Nylsvley Reserve S	65 ha Acacia woodland+Mixed Bv. along vley	1.5	50	55
1c	Nylsvley Reserve centre	75 ha open broad-leaved bush+Acacia along vley	1.8	50	65
1d	Nylsvley Reserve N	50 ha open broad-leaved bush+Acacia along vley	2.5	45	75
1e	Verene	15 ha open mixed & broad-leaved bush	2.5(4)	30	35(55)[1]
1f	Deelkraal	100 ha Acacia bush & grassland	2.5(3.8)	45	(80)[1]

[1]See discussion for variation in the percentage of males.

detectability) were reduced to 50% for inclusion in Table 1. High densities were also recorded in one-visit strip transects along the roads towards the entrance of Klaserie (5–15/10 ha on narrow grass strips bordering the road; included in Table 1 by an average value of 10 birds/10 ha). Very low densities occurred in the dense Mopane bush with nearly complete absence of herbaceous layer between Letaba and Phalaborwa. In the open Acacia scrub (dry Knobthorn Veld) around Satara, Red-backed Shrikes occurred at a nearly uniform high density. The fact that the proportion of males is higher than expected is discussed below.

In the geographical area of the Bushveld (Fig. 1) variation was less pronounced. Nevertheless, in the Ruigedraai area, the densities varied from 6.5 in the plain to 2 birds/10 ha on the dry stony hills within a distance of 5 km. In the Nyl area (Table 2) densities were lower in areas with a large proportion of open grassland (The Ridge), increasing in open bush areas, and decreasing again where bush and/or tree cover was too dense (Nylsvley South). The densities in the Nylsvley Reserve are based on multiple strip transects, the others on area surveys. In order to render the results of the surveys comparable with the transects, reduced figures are given in addition to the survey data (in brackets). In the case of "The Ridge" we were able to detect 60–70% of the known birds by strip transects; thus, the comparable value is 0.7 birds/10 ha, while the total density was at least 1.1 birds/10 ha. At "Verene" the total density comprised at least 2 males and 4 female-plumaged birds on a surface of 15 ha in November/December (corresponding to 4 birds/10 ha); normal strip transects covering 12 ha of the same area resulted in a mean of three birds detected, corresponding to the 2.5 birds/10 ha which are given as the "comparable" figure. The "comparable" value for "Deelkraal" is the mean derived from three area surveys with two observers. On 11 November and 1 December an improved coverage with 4 observers revealed a density (closer to the real density) of 3.5 birds/10 ha which is given in brackets. An interpretation of the variability in sex-ratios is given in the discussion.

Discussion

Methods

The limitations of the present study are mainly attributable to the restricted time available (only one season) and the different methods used. Densities may differ between years and vary as the season progresses. The detectability is lower in strip transects than in area surveys by two persons and is generally reduced in higher and denser vegetation. Behavioural differences between males and females may cause further bias. Atlas reporting rates (Bruderer & Bruderer 1993) tend to level out variation in time and space, but provide no direct information on densities. Sporadic occurrence in time and space may already provide reporting rates of 1–5% in a conspicuous species, while densities ranging from 5 to 15 birds/10 ha or even up to 80 birds/ha (Herremans 1993) are all included in reporting rates of 50–100% (Bruderer & Bruderer 1993), which may indicate some sort of logarithmic relationship between reporting rates and densities in a conspicuous species.

The detectability seemed to vary around 50% (60% and 40% for known males and females, respectively); it was assumed to be slightly lower in one-visit strip transects and slightly higher in area surveys done by two persons. The assumed detectabilities seem to be realistic in a one-species survey of a conspicuous species. Hildén (1981) estimated the mean efficiency of the Finnish line-transect method for a mixture of species to be in the order of 45–50% in one visit, while Järvinen & Väisänen (1981) suggested 60–65%. Diehl (1981) emphasizes the variation in detectability at different phases of the breeding cycle of Red-backed Shrikes, but deals with detectabilities similar to ours. With a detectability of 50% one would have to double the densities recorded in one-visit counts to obtain rough estimates of real densities, or one has to reduce complete censuses accordingly to render them comparable to strip transects (Tables 1 and 2).

Densities in different areas and habitats

Tarboton (1980) provides the only comparable data on densities in South Africa. In the Nylsvley area he found 19 birds/100 ha in Acacia Savanna and 2.7 birds/100 ha in Burkea Savanna. Our Deelkraal data (25 birds/100 ha) closely match Tarboton's Acacia census. Our counts did not cover the sparsely populated Burkea Savanna. Like our counts, Tarboton's censuses emphasize the fact that within a few kilometers there may be a mosaic of veld types. This local variation in the veld types and habitat structure is reflected in the density of shrikes (Tables 1 and 2). As Red-backed Shrikes are very opportunistic in their habitat selection in the non-breeding area, the densities in a certain area change with season; local concentrations may build up within a matter of days or even hours when large amounts of food become available (e.g. after cattle grazing, or when termites are swarming).

Counts by Herremans (1993) in the core area of the Red-backed Shrike's non-breeding area (i.e. different subkalahari habitats in Botswana) provide another basis for comparison. His density estimates range from 1–3 birds/10 ha in dense broad-leaved vegetation and in open grassland to 3–39 (exceptionally 80) birds/10 ha in Acacia and open broad-leaved vegetation. The lower densities match our Bushveld counts, while our Lowveld counts come into the lower half of the densities recorded in good subkalahari habitats. If we accept the assumption of Herremans (pers. comm.) that, by using the call of a Pearl-spotted Owl *Glaucidium perlatum* to provoke alarm-calls of all shrikes present in the immediate neighbourhood, his recorded numbers correspond to 100%, our Lowveld counts of 2–15 birds/10 ha (Table 1), which are assumed to represent about 50% of the birds present, may come close to the subkalahari numbers when extrapolated to 100% (=4–30 birds/10 ha).

A preliminary analysis of the habitats of Red-backed Shrikes in the northern part of Transvaal (unpubl.) shows that, in general, low scrub (1–3 m high) is preferred to higher bush and trees; open bush (10 to 50% coverage) is preferred to dense coverage or open grassland. This corresponds to the distribution of Red-backed Shrikes in eastern Botswana, where Herremans (1993) also observed reduced densities in open grassland and in dense broad-leaved vegetation compared to vegetation of medium density (see above). Similarly, in the herbaceous layer, medium cover and restricted height is favoured: low grass (less than 50 cm) seems to be preferred to high grass, and medium grass-cover (50 to 80%) to bare sand or dense grass. These preferences, which are also reflected in the preference for certain veld types, are related to the hunting behaviour of the Red-backed Shrike and to the availability of large, mainly ground-dwelling insects. Red-backed Shrikes prefer perches 1.5–2 m high with open space around, and a herbaceous layer which supports many insects but leaves sufficient open patches to detect and catch them on the ground.

A discrepancy exists between the high preference of Red-backed Shrikes for the veld type "Mopani Veld" (Bruderer & Bruderer 1993) and the very low densities found in the dense Mopane bush with very sparse undergrowth between Phalaborwa and Letaba (Table 1). The explanation may be, that the veld type defined by Acocks (1988) is usually not a 'monoculture' of *Colophospermum mopane*. It ranges from grassland with more or less scattered trees and/or bushes dominated by *C. mopane* to dense monospecific Mopane woodland.

Sex-ratio

The percentage of males in all the one-visit samples (Table 1) is higher than expected according to the sex-ratio in breeding populations (see below). Over-representation of males is also known from other comparable counts. Becker (1974) found only one female among 30 birds sitting (in early April) on wires along the Kalkfeld–Okaputa railway (Namibia). D. Ludwig (*in litt.*) counted (in February) 6 *L. collurio* on a line transect of 2 km near Windhoek, 5 of which were males. P. J. Mundy (*in litt.*) states that the Red-backed Shrike was the most widespread and probably the commonest shrike in the southwest corner of Zimbabwe (end of March 1990) and that males outnumbered females by at least ten to one. From the difference between one-visit strip transects (Table 1) and area surveys (part of Table 2) in our study, we assume different behaviour which may result in a local segregation, with males perching conspicuously along open patches or strips (such as roads), while females behave more secretively and may be less prone to use exposed perches. This would be similar to the behaviour of the sexes in the breeding area.

As moult (which allows sexing of immatures increasingly from January onwards) progresses, the percentage of sexable males changes with season. If there is no geographical segregation of the sexes one would expect a sex ratio close to 50:50. A balanced sex-ratio was observed in the Jura mountains (U. Leugger pers. comm.) and in the best shrike areas in the Swiss Alps (Engadin) where M. Müller (pers. comm.) noted usually 1 or 2 surplus males among 150 to 200 birds in the years 1988–1991. He also reports that usually between 45% and 50% of the birds present are yearlings. Thus, we have good reason to assume a sex-ratio of 50:50 and a ratio of young to adult birds of 50:50 in the non-breeding range. When all males have reached a moult stage which allows sexing in the field in February (own unpubl. data, based on skins) we would expect 25% sexable males in December and between 25 and 50% from the beginning of January to mid-February. Thus, in Table 1 the expected percentage of males during January is of the order of 40%, and in February/March 50%, which is lower than observed in both cases. In Table 2 the expected value for November/December is 25%, a value which is closely matched by the censuses in the mixed Bushveld at "Verene" and "The Ridge". The Acacia bush at "Deelkraal" shows a higher percentage of males although the censusing methods were the same. This raises again the question of habitat segregation between males and females which was put forward as a hypothesis by Bruderer & Bruderer (1990), for which there are also indications from Botswana, where Herremans (pers. comm.) found that females preferred denser vegetation than males.

Comparison with densities in Europe

In Europe the species occurs mainly in areas where agriculture is still traditional, allowing a mosaic of hedges, cultivated fields, fallows, and pasture land. In Germany, Jakober & Stauber (1987) found 1–6 pairs/10 ha in small areas with optimal habitats. Such high densities occur over fairly large areas along open slopes of the Jura mountains and in the dry inner Alpine valleys of Switzerland (Wallis/Lower Engadin) where 5–38 pairs/100 ha were recorded (Dell'Oca 1987, Schifferli 1989, Rudin 1990). Highest densities are reached in the Lower Engadin, where 30 of about 100 test areas of 50–200 ha showed more than 10 pairs/100 ha; 9 of these held more than 30 pairs/100 ha, 5 more than 40 and one 105 pairs/100 ha (Müller 1990). Recorded densities (about 50% of real densities) in Tables 1 and 2 can be directly compared with the number of pairs (2 birds) in the breeding-season censuses. Most of them compare well with those in optimal habitats in Switzerland. The high densities in the Lowveld and the Limpopo basin are of the same order as the Engadin values. The highest values (Satara, Olifants) are clearly higher than the highest breeding densities and are valid for large areas. If we bear in mind the fact that breeding pairs have to feed 3–5 young and enlarge their territories soon after the fledging of the young, we may conclude that the best breeding areas in Europe support a similar number of full-grown birds per unit surface as the arid savannas of southern Africa.

Summary

Strip transects and area surveys in the South African parts of the Red-backed Shrike's non-breeding range provided density figures for different areas and habitats. Based on an estimated average detection rate of 50%, these recorded densities have to be doubled for estimates of real densities. In Transvaal Province, the highest densities of 10–15 birds/10 ha were recorded in semi-arid parts of the Lowveld. In the Bushveld 5–6 birds/10 ha were counted in the north, decreasing to less than 2 birds/10 ha further south. Comparing densities with reporting rates from the southern African bird atlas projects suggests some sort of a logarithmic relationship between reporting rates and densities in this conspicuous species. Wide variation of densities occurs due to patchy habitat. Highest densities were recorded in arid savanna types of medium coverage and height. The observed sex ratios, which are usually distorted in favour of males, may be explained by different behaviour and local habitat segregation of the sexes. An attempt to compare the even more patchy breeding densities in Europe with the non-breeding densities indicates that the best breeding areas in central Europe support similar numbers of full-grown birds as the arid savannas in southern Africa.

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The present state of pelican populations (*Pelecanus onocrotalus* and *P. crispus*) in Kazakhstan

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Only the White Pelican *Pelecanus onocrotalus* and Dalmatian Pelican *P. crispus* are found, in small numbers, in Kazakhstan. They inhabit large reservoirs, lake systems and the deltas of several large rivers. Due to anthropogenic influences, especially land reclamation, the

TABLE 1
The number of nesting pairs of White Pelicans in Kazakhstan

Years	Location	No. of colonies	No. of pairs	Reference
1985	Lakes of lower reaches of Irghiz and Turgai	2	20–30	Auezov 1986
1987	Sarikopa lake system	1	350	E. M. Auezov pers. comm.
1984–87	Naurzum Reserve	1	4–200	Gordienko 1989
1984–85	Ily River delta	1	1700	Zhatkanbayev 1986
1986–88	Ily River delta	1	1500–2500	Zhatkanbayev & Gavrilov 1990
1986	Lake Balkhash	1	250–300	E. M. Auezov pers. comm.
1982	Tentek River delta	1	150	B. P. Annenkov pers. comm.
1987	Tentek River delta	1	400	B. P. Annenkov pers. comm.
1985	Kara Ertis River delta	1	300	N. N. Beresovikov & B. V. Sherbakov pers. comm.

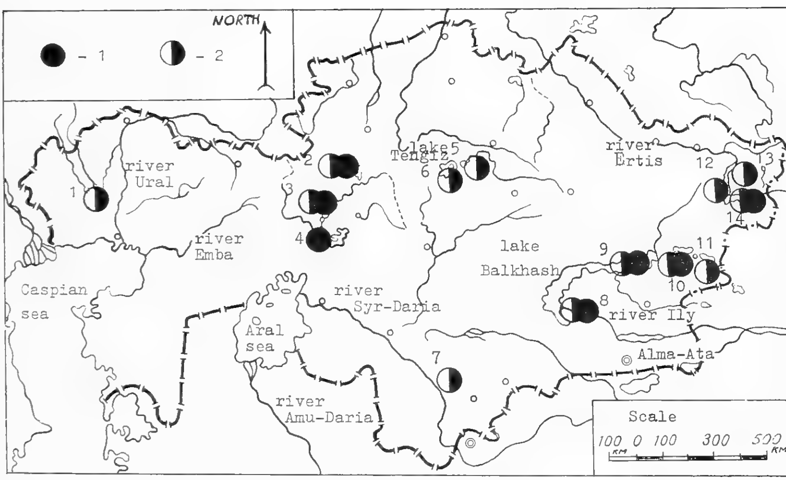

Figure 1. Distribution of pelican colonies in Kazakhstan. Key (inset): 1, White Pelican; 2, Dalmatian Pelican. Localities: 1, Kamysh-Samar lake system, lower reaches of Kushum River, Dongelek storage lake; 2, Naurzum Reserve; 3, Sarikopa lake system; 4, lakes of lower reaches of Irghiz and Turgai rivers; 5, Lake Korgalzhin; 6, Lake Tenghiz; 7, Shoshkakol lake system; 8, Ily River delta; 9, Lake Balkhash; 10, Tentek River delta; 11, Lake Alakol; 12, Bukhtarma storage lake; 13 small lake east of Kurchum settlement; 14, Kara Ertis River delta.

deterioration of hydrological conditions, and fires, areas suitable for their nesting have diminished, and many colonies have disappeared in the last half-century. Both species are included in the *Red Data Book* for Kazakhstan (1978), and the Dalmatian Pelican also in the ICBP *Red Data Book* (1981).

TABLE 2
The number of nesting pairs of Dalmatian Pelicans in Kazakhstan

Years	Location	No. of colonies	No. of pairs	Reference
1970s	Kamysh-Samar lake system, lower reaches of Kushum River, Dongelek storage lake	Separate nests	10	V. L. Shevchenko & P. V. Debelo pers. comm.
1987	Sarikopa lake system	1	50	E. M. Auezov pers. comm.
1982–87	Naurzum Reserve	1	3–20	Gordienko 1989
1972–74	Lake Tenghiz	1	7–12	Volkov 1985
1975–82	Lake Korgalzhin	1	10–88	Volkov 1985 and pers. comm.
1982–87	Lake Korgalzhin	1	70–315	Andrusenko & Minakov 1986; N. N. Andrusenko pers. comm.
1988	Shoshkakol lake system (Shimkent region)	1	6	V. V. Lopatin, R. R. Sibgatullin & M. E. Buketov pers. comm.
1984, 1986	Lake Balkhash	2	55–90	Auezov 1986 and pers. comm.
1984–85	Ily River delta	5	650–820	Zhatkanbayev 1986
1986–88	Ily River delta	4	780–920	Zhatkanbayev & Gavrilov 1990
1979, 1986	Lake Alakol	1	8	B. P. Annenkov and E. M. Auezov pers. comm.
1980	Tentek River delta	1	6	B. P. Annenkov pers. comm.
1981	Tentek River delta	1	4	
1982	Tentek River delta	1	7	
1987	Tentek River delta	1	253–262	
1979–82	Kara Ertis River delta	1–7	40–350	N. N. Beresovikov & B. V. Sherbakov pers. comm.
1983	Bukhtarma storage lake	1	5	
1985	Small lake east of Kurchum settlement (East Kazakhstan region)	1	6	

White Pelican

In the 1940s and 1950s the White Pelican nested along the northeastern coast of the Caspian Sea, in the deltas of the Volga, Ural and Emba rivers, and in the Syr-Daria delta, Aral Sea (Shnitnikov 1949, Dolgushin 1960). In the 1980s nesting occurred at the lakes of the Turgai Depression, the Naurzum Reserve, Lake Balkhash, and in the deltas of the Ily, Tentek and Kara Ertis. Details are given in Table 1. The present breeding population of White Pelicans in Kazakhstan is *c.* 4000 pairs.

Dalmatian Pelican

In the 1940s and 1950s Dalmatian Pelicans nested at many reservoirs and deltas of large rivers in the steppe and desert areas of Kazakhstan

(Shnitnikov 1949, Dolgushin 1960). In the 1970s and 1980s this species was found only at the lakes of the Ural region, Turgai Depression, Naurzum Reserve and Tenghiz-Korgalzhin Depression, the Shoshkakol lake system in the Shimkent region, the Ily River delta, Lakes Balkhash, Alakol, Zaisan and Bukhtarma storage lake, and the Kara Ertis River delta. Details are given in Table 2. The present breeding population in Kazakhstan is *c.* 1500–1800 pairs.

Problems of pelican conservation

The main factors responsible for the decrease of pelicans in Kazakhstan are poaching, disturbance of nesting pairs, fires, poisoning by pesticides, sudden changes of water level in reservoirs, cutting of reeds, and decrease of fish. The Cormorant *Phalacrocorax carbo* may be a competitor for food and space in breeding colonies. Primary predators are the Carrion Crow *Corcus corone* and Herring Gull *Larus argentatus*, both of which eat eggs and downy chicks. Also small chicks leaving nests may be eaten by the sheat-fish (*Silurus glanis* L.).

Pelicans are not protected in Kazakhstan. They have not been reared in zoological gardens. In order to preserve pelican populations in the republic it is necessary to create a reserve in the Ily River delta, the size of which should be no less than 65,000 ha. It is there that the largest pelican population of Eurasia is found. Additional reserves should be created in the deltas of the Tentek and Kara Ertis. It would also be advisable to give serious consideration to any hydrotechnical installations which would influence hydrological conditions in pelican habitats. Policies involving fishing, hunting, poaching, harvesting reeds, fires, and pasturing animals close to pelican colonies should be written and approved by government agencies. It is necessary to monitor pelican numbers and study biological and ecological factors, especially toxic chemicals, that are affecting pelican colonies.

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IN BRIEF

LAUGHING GULL *LARUS ATRICILLA* AND FRANKLIN'S GULL *L. PIPIXCAN* IN THE ECUADORIAN ANDES

On the morning of 20 November 1991 I was watching a flock of Andean Gulls *Larus serranus* circling at the northern end of Lago de Colta, near Santiago de Quito, Prov. Chimborazo, Ecuador (elev. *c.* 3250 m). At 08.00 I noticed a roughly similar-sized but much darker gull in the area, which was identified as a Laughing Gull *L. atricilla* and appeared to be in second-winter plumage. The bird was observed in flight for about 2 minutes and came as close as 30 m, where I could photograph it (Fig. 1). Again on the same day, at 16.00, I watched an adult winter and five first-winter Franklin's Gulls *L. pipixcan* with 27 Andean Gulls in the highlands (*c.* 3100 m) 10 km south of Cañar, Prov. Cañar, Ecuador. These birds were initially feeding and resting in a freshly ploughed field. After 10 minutes they flew to a small reservoir, where I could photograph some of them (photographs in Editor's files).

These are the first records of Laughing Gull and Franklin's Gull for the Ecuadorian Andes (cf. Fjeldså & Krabbe 1990, *Birds of the High Andes*, Ortiz Crespo *et al.* 1990, *Aves del Ecuador*, Fernando I. Ortiz Crespo *in litt.*, Robert S. Ridgely *in litt.*). The Laughing Gull is a common migrant along the Ecuadorian coast (Ben Haase *in litt.*), being a non-breeding visitor along the northern half of the Pacific coast of South America, in very small numbers down to southwestern Peru (Hughes 1988, *Bull. Brit. Orn. Cl.* 108: 29–43). The first Laughing Gull record for Chile was also established in November 1991 (Hoogendoorn 1993, *Amer. Birds* 47: 156–158).

The species is irregular to rare far inland beyond its regular coastal range in the Americas, and indeed every interior record is noteworthy (for South America e.g. Tallman & Tallman 1977, *Rev. Univ. Católica, Quito* 5: 217–224; Pearson 1980, in A. Keast and E. S. Morton (eds), *Migrant Birds in the Neotropics:* 273–283). Anywhere else where it has occurred as a vagrant, e.g. in Europe, North and West Africa, and Australia, it is almost exclusively coastal (Hoogendoorn & Steinhaus 1990, *Dutch Birding* 12: 109–164).

Probably the highest-in-elevation Laughing Gull ever recorded in North America is a bird observed at Aurora, Colorado, at 1680 m elevation, on 2–15 February 1986 (Prather 1986, *Colorado Field Orn. J.* 20: 27–33, Hugh E. Kingery *in litt.*). In South America, a Laughing Gull in the eastern Andes of Colombia at 3020 m elevation appears to be the highest recorded (Hilty & Brown 1986, *A Guide to the Birds of Colombia*, Fjeldså & Krabbe 1990, J. Fjeldså and S. L. Hilty *in litt.*). The original source of this record could not be traced. Apparently, the Lago de Colta bird marks a new record for elevation for the species, and the southernmost far inland occurrence in South America.

Franklin's Gull is an abundant migrant along the Ecuadorian coast of Prov. Guayas (Ben Haase pers. comm.; pers. obs.), and is a non-breeding visitor along the Pacific coast of South America, down to southern Chile (Araya Mödinger *et al.* 1986, *Guia de campo de las aves de Chile*). As an inland and high-altitude record the Cañar observation cannot be considered as exceptional, as the species occurs occasionally at considerable distances inland and at high elevations elsewhere in South America; but it appears to be the northernmost Andean record. It has been recorded from the Andes of Peru and Bolivia (Plenge 1974, *Condor* 76: 326–330; Hughes 1977, *Biotropica* 9: 52; Remsen & Ridgely 1980, *Condor* 82: 69–75; Harris 1980, *Publ. Mus. Hist. Nat. "Javier Prado", Zool., Ser. A* 27: 1–14, Fjeldså 1983, *Steenstrupia* 8: 285–298; Fjeldså 1988, *Bol. Lima* 58: 61–68; Hughes 1988), in trans-Andean Peru (Schulenberg 1980, *Gerfaut* 70: 403–404), in the Central Valley of Chile near Santiago (Carlos G. Guerra Correa pers. comm.), and in Prov. Córdoba in central Argentina (Nores & Yzurieta 1979, *Hornero* 12: 45–52; Olrog 1979, *Opera Lilloana* 27: 1–324; Nores *et al.* 1983, *Bol. Acad. Nac. Cienc., Córdoba* 56: I–IX, 1–114), sometimes in flocks of hundreds or thousands. Elsewhere, Franklin's Gull has often shown its capacity as an inland wanderer, which is not surprising for an exclusively inland breeder. Thus in Europe there are inland records of vagrant individuals from Spain, France, Britain, Belgium, The Netherlands, Germany and Sweden (Hoogendoorn & Steinhaus 1990).

Figure 1. Laughing Gull *Larus atricilla* in second-winter plumage, Lago de Colta (Santiago de Quito), Prov. Chimborazo, Ecuador, elev. *c.* 3250 m, 20 November 1991.

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WHERE ARE THE LIMITS OF THE WESTERN PALEARCTIC?

The Palearctic is a natural continuum. Nonetheless, the term 'Western Palearctic' is in common usage (e.g. in popular ornithological journals) and it is therefore helpful to consider the most appropriate definition of this sub-region. The editorial statement in *Birds of the Western Palearctic* (Vol. 1), that the definition of the eastern limits of the western part of the Palearctic is "largely arbitrary", has received little subsequent attention. In the southeast, renewed examination of the most appropriate 'limits' in Iran and the Arabian peninsula is, therefore, worthwhile.

While the need for greater recognition of the distinctiveness of the Saharo-Sindian zone avifauna (Harrison 1986, *Atlas of the Birds of the*

Western Palaearctic) needs repeating, treatment of the Arabian as well as the Saharan deserts as essentially western offers a less confusing approach to the subdivision of the Palearctic on a grand scale than the more restrictive area treated in *BWP*. Given the essentially Saharo-Sindian composition and lack of eastern elements within the breeding landbird avifauna of arid central Arabia, there are apparently no reasons for its exclusion from a 'western' ambit.

An extremely small proportion of the Arabian peninsula which supports an avifauna dominated by Afrotropical (previously termed Ethiopian) elements is a conspicuous exception. This is restricted to two areas: the western scarps and fringe of the montane southwest, and the slopes immediately adjacent to the central south coast, in Dhofar. Plant communities in these areas are monsoon-sustained ecological islands surrounded by radically different environments. They support bird communities which apparently represent relics of an ancient, more extensive Afrotropical/Paleotropical avifauna. The extent and limits of these areas may be clarified in order to define what areas of Arabia *cannot* properly be treated as western Palearctic. The significance of the smaller number of Oriental/eastern breeding species in (mainly coastal) southeastern Arabia is not considered here.

In Yemen, the Afrotropical element is dominant within the breeding avifauna as far as the upper limits of the western slopes, extends more weakly across the central plateau and to a much diminished extent beyond, through the eastern flanks of the highlands. It is too weakly expressed along the eastern fringe to justify the frequent presentation of the entire southwestern tip of Arabia as wholly Afrotropical. Equally, treating such an extensive area as 'transitional', another past approach, does not properly reflect local differences in bird distributions. If a transition zone has to be defined, then this would be best restricted to the highland plateau only. Thus, the poorly demarcated eastern and more clearly defined western fringes of the plateau represent restrictively and expansively defined limits to Saharo-Sindian/western Palearctic influence respectively. In Dhofar, Afrotropical species are almost exclusively confined to the thin strip of drought deciduous woodland on (mainly) coastal or high slopes.

In Iran, the most appropriate limits to strong western influence are defined by a line from the northern Gulf coast, slightly west of the Straits of Hormuz, through a gap between the southwesternmost flanks of the Zagros and the uplands of the Makran coast/Iranian Baluchnistan, northwestward along the eastern flank of the Zagros range, turning eastward along the southern flank of the Elburz range, at the lowest altitude at which temperate taxa predominate, as far east as the Kuh-e Hazar Masjed and thence, westward, along the lower northern flanks of the Elburz range (west of Ashkabad in Turkmenistan) to the Caspian coast.

More detailed discussion of these conclusions is in preparation.

6 Connaught Road,
Norwich,
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R. P. MARTINS
E. HIRSCHFELD
2 November 1993

NOTICE TO CONTRIBUTORS

Papers, from Club Members or non-members, should be sent to the Editor, Dr D. W. Snow, The Old Forge, Wingrave, Aylesbury, Bucks HP22 4PD, U.K., and must be offered solely to the *Bulletin*. They should be typed on one side of the paper, with **treble**-spacing and a wide margin, and submitted in duplicate. The style and lay-out should conform with usage in this or recent issues of the *Bulletin*.

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Correspondence about Club Meetings and on all other matters should go to the Hon. Secretary, Mrs A. M. Moore, 1 Uppingham Road, Oakham, Rutland LE15 6JB, U.K.

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Bulletin of the

British Ornithologists' Club

Edited by
Dr D. W. SNOW

Volume 114 No. 4 December 1994

FORTHCOMING MEETINGS

Tuesday, 17 January 1995. We welcome back **Dr David T. Parkin,** Reader in the Department of Genetics of the Queens Medical Centre, Nottingham. Dr Parkin's subject on this occasion will be **"Recent Developments in the Forensic Investigation of Birds of Prey".**

Those wishing to attend are asked to notify the Hon. Secretary by Tuesday, 3 January 1995.*

Tuesday, 21 March 1995. Dr Ian Newton F.R.S. of the Institute of Terrestrial Ecology at Monks Wood will speak on **"The Year of the Sparrowhawk".** Dr Newton's work on finches and sparrowhawks is of international renown.

Those wishing to attend are asked to notify the Hon. Secretary by Tuesday, 7 March 1995.*

Tuesday, 25 April 1995. Mr D. A. Turner, who is well known to visitors to East Africa, will speak on **"Ornithology in East Africa, looking back over the last thirty years and into the 21st century".**

Those wishing to attend are asked to notify the Hon. Secretary by Tuesday, 11 April 1995.*

Tuesday, 23 May 1995. ANNUAL GENERAL MEETING at 6 p.m. This will be followed by the evening meeting at which **Dr D. H. Thomas** of the University of Wales will speak on **"Cool Birds in Hot Deserts".**

Those wishing to attend the evening meeting are asked to notify the Hon. Secretary by Tuesday, 9 May 1995.*

Meetings are held in the Sherfield Building of Imperial College, South Kensington, London at 6.15 p.m. for 7 p.m. A map showing Imperial College will be sent to members on request.

Overseas Members visiting Britain are particularly welcome at meetings—details of which can be obtained from the Hon. Secretary, 1 Uppingham Road, Oakham, Rutland LE15 6JB. Telephone (0572) 722788.

*Late acceptances and cancellations can usually be taken up to the weekend preceding a meeting, although members are asked to accept by 14 days beforehand as arrangements for meetings have to be confirmed with Imperial College well in advance.

Bulletin of the BRITISH ORNITHOLOGISTS' CLUB

Vol. 114 No. 4 Published 21 December 1994

The eight hundred and forty-first meeting of the Club was held on Tuesday, 19 July 1994, at 6.15 p.m. in the Senior Common Room of the Sherfield Building at Imperial College. 24 Members and 12 Guests attended.

Members attending were: D. GRIFFIN (*Chairman*), Miss H. BAKER, P. J. BELMAN, Mrs D. M. BRADLEY, D. R. CALDER, Professor R. CHANDLER, Dr. R. A. CHEKE, S. J. FARNSWORTH, D. J. FISHER, A. GIBBS, C. A. R. HELM, R. KETTLE, Dr C. F. MANN, D. J. MONTIER, Mrs A. M. MOORE, R. G. MORGAN, Mrs M. MULLER, R. E. F. PEAL, Dr R. SELF, P. J. SELLAR, Dr D. W. SNOW, N. F. S. STONE, Dr C. VIOLANI, Professor W. E. WATERS.

Guests attending were: Mr RICHARD FFRENCH (*Speaker*), Mrs J. CALDER, I. DAWSON, Mrs F. FARNSWORTH, G. GIBBS, Ms K. HOFF, Mrs M. MONTIER, P. J. MOORE, C. A. MULLER, Miss M. POTTER, R. RANFT, Mrs B. SNOW.

After supper the Editor read a short note from Mr J. G. Parker on a recent sighting of Finsch's Wheatear *Oenanthe finschii* on the Black Sea coast of Bulgaria, in an area where it had also been seen in 1993 and breeding was suspected. The habitat is untypical of the species, limestone cliffs falling sharply down to the sea. Breeding, if proved, would mean a very substantial range extension from the nearest known breeding area in inland Turkey. Mr Parker urged anyone visiting coastal Bulgaria to be on the look-out for this species.

The principal speaker of the evening was Mr Richard ffrench, who spoke on "Bird Sounds from the Neotropics". Sounds from about 50 neotropical species were presented. The first group comprised mainly common species of forests or semi-open woodland, including gregarious birds like oropendolas, caciques and chachalacas, and undergrowth species, some of them in duet, such as wrens and antbirds. Certain cotingas and manakins were illustrated in more detail, with descriptions of their often complex and ritualistic displays; the fascinating communal displays of *Chiroxiphia* manakins were described, showing some differences in calls from different regions. Finally, a group of interesting calls were presented, many from heterogeneous species inhabiting gallery forest or wetlands, followed by songs from seven species, including four different wrens, with particularly beautiful command of tone, pitch, variation of mood and rhythmic inventiveness.

The eight hundred and forty-second meeting of the Club was held on Tuesday, 9 August 1994, at 6.15 p.m. in the Ante-room of the Sherfield Building at Imperial College. 15 Members and 10 Guests attended.

Members attending were: D. GRIFFIN (*Chairman*), M. A. ADCOCK, Miss H. BAKER, P. J. BELMAN, D. J. CALDER, Professor R. CHANDLER, S. J. FARNSWORTH, A. GIBBS, The Revd T. W. GLADWIN, R. H. KETTLE, Mrs A. M. MOORE, Mrs M. MULLER, Dr T. J. ROBERTS, P. J. SELLAR, N. H. F. STONE.

Guests attending were: Professor JACQUES VIELLIARD (*Speaker*), P. DELALOYE, Mrs F. FARNSWORTH, Mrs J. GLADWIN, A. GREENSMITH, Mrs S. GRIFFIN, P. J. MOORE, R. RANFT, C. SNOOKS, Miss R. WARREN.

After supper the speaker was Professor Vielliard and his title was "Hummingbirds also sing: a survey of Brazilian bird vocalisations". Professor Vielliard has sent the following summary of his talk.

Although renowned for the unique brilliance of their plumage, hummingbirds are also expert singers. Surprisingly, they utter very complex vocalisations in spite of relying on sophisticated visual displays and of being equipped with a relatively simple syrinx. These sounds remain poorly known because they are high-pitched and unimpressive. The vocal repertoire of hummingbirds is made up mostly of aggressive calls, but a species-specific stereotyped song exists in all well studied species, emitted singly or in lek, persistently or sometimes very sporadically. The physical structure of hummingbird voices is extremely varied and attains the greatest complexity known among birds. This was illustrated by sonagrams and tapes, which also included some other Brazilian species noteworthy for their voice (in particular the remarkable mimicry of the Lawrence's Thrush *Turdus lawrencii*), and some recently described species.

The eight hundred and forty-third meeting of the Club was held on Tuesday, 20 September 1994, at 6.15 p.m. in the Senior Common Room of the Sherfield Building at Imperial College. 35 Members and 12 Guests attended.

Members attending were: D. Griffin (*Chairman*), Dr Storrs Olson (*Speaker*), M. A. Adcock, Dr J. S. Ash, Miss H. Baker, P. J. Belman, I. R. Bishop, P. J. Bull, M. Bruce, D. R. Calder, Cdr M. B. Casement, Dr R. A. Cheke, S.J. Farnsworth, Dr C. J. Harrison, C. A. R. Helm, R. Kettle, Dr R. Liversidge, Dr C. Mann, Dr J. F. Monk, D. J. Montier, Mrs A. M. Moore, R. G. Morgan, Mrs M. Muller, P. J. Oliver, R. E. F. Peal, Dr R. Prŷs-Jones, N. J. Redman, R. E. Scott, P. J. Sellar, P. William Smith, Dr D. W. Snow, S. A. H. Statham, N. H. F. Stone, Dr C. Violani, M. P. Walters.

Guests attending were: Mrs J. Ash, Mrs G. Bonham, Mrs J. Bull, Dr Avis James, Dr H. Liversidge, Mrs R. Liversidge, Mrs M. Montier, P. J. Moore, Mrs A. Scott, Mrs S. Smith, J. Stewart, G. Wragg.

After supper Dr Storrs Olson spoke on "Seabirds of the North Atlantic through 20 million years". He has sent the following account of his talk.

A very good fossil record of marine birds is now available from the North Atlantic, founded mainly on some hundreds of bones of Middle Miocene age (14 million years ago) from cliffs along the Chesapeake Bay in Maryland and Virginia, and from tens of thousands of bones from a phosphate mine at Lee Creek, North Carolina, some of which are contemporaneous but most of which are early Pliocene (4 million years) in age. The little known from the eastern North Atlantic indicates equivalent or identical faunas at these times. The middle Miocene was a time of low species diversity, many of the species being substantially different from modern ones. In the early Pliocene, species diversity was much greater than previously or at present, although structurally, most of the seabirds were either identical to modern species or essentially modern in aspect. Birds that swarmed in the tremendously productive upwellings off North Carolina included a multitude of shearwaters, 5 species of albatrosses, a dozen species of auks and puffins, several species of gannets, perhaps three species of gigantic pseudotoothed Pelecaniformes, two cormorants, the three modern species lineages of divers, as well as various ducks and geese (the commonest being Harlequin Duck), etc. Closing of the Panamanian seaway at the end of the Pliocene and the resulting disruptions of currents and upwelling, along with the climatic rigours of the Pleistocene, caused numerous global or local extinctions. Pseudodontorns disappeared worldwide, albatrosses vanished from the North Atlantic, along with various shearwaters, several species of auks related to *Alca*, a puffin, and others. In partial compensation, guillemots (*Cepphus* and *Uria*) colonised the Atlantic from the Pacific during the Pleistocene.

On the biology and voice of the Javan Scops Owl *Otus angelinae*

by J. H. Becking

Received 23 August 1993

The Javan Scops Owl *Otus angelinae* described by O. Finsch in 1912 is an endemic of Java. It is apparently rare as there are only ten specimens in museum collections, i.e. eight specimens in the Leiden Museum (NNM), including the type collected by M. E. G. Bartels Sr. on Mt Pangrango, and two in the Bogor Museum (ZMB); one from Cibodas, the other from Ijen, eastern Java. It is so far known only from two localities (Mt Pangrango/Gede and Mt Tangkubanperahu) in western Java, and one locality in eastern Java. About its biology very little is known. Andrew & Milton (1988) reported an observation of two fledglings of this species encountered on the NNE slope of Mt Pangrango in February 1985, but the adults were not seen.

There have been widely divergent opinions on the taxonomic status and relationships of *O. angelinae*, especially as its voice is unknown. G. P. Hekstra (in Burton 1973) regarded it as conspecific with *O. spilocephalus*, which ranges from the Himalayas to Taiwan and Sumatra; Sibley & Monroe (1990) also mention that as a possibility. Its relationship with *O. brookii* (Sharpe 1892) has been confused by the belief that *brookii*, a montane species occurring in Borneo and Sumatra, also occurs on Java. However, a re-examination of the unique specimen (collected in March 1916 in the Ijen Highlands, eastern Java; MZB 11752) on which its supposed occurrence in Java has been based, shows that it was misidentified and is in fact a specimen of *O. angelinae*. *Otus angelinae* is therefore almost certainly the only montane scops owl in Java, and a Javan endemic. A full discussion of its taxonomy will be given in a separate paper. In view of its very restricted distribution and its unknown status, it is listed as threatened in the recent ICBP *World Checklist of Threatened Birds* (Collar & Andrew 1988).

In July 1990, returning in the early evening from the summit of Mt Gede/Pangrango (3019 m), being at about 1500–1600 m and heading towards the Cibodas Mountain Garden, my attention was drawn to a hissing sound. This proved to be the contact call of two fledglings of the Javan Scops Owl. Taking advantage of the opportunity to study this uncommon species, I camped nearby and studied the owls for about $2\frac{1}{2}$ weeks with a short interruption of a few days. The observations made during this period and some additional records of this owl at other localities are the subject of this paper.

(Frontispiece) Javan Scops Owl *Otus angelinae* in daytime roost in dense, entangled vegetation of stems of *Cyrtandra picta* (Gesneriaceae) at low level (1.20 m). Cibeureum waterfalls, Mt Gede/Pangrango, 1900 m, 14 July 1991.
Photo: Manuel Ruedi (Univ. Lausanne).

Methods

The owls were studied for 17 consecutive nights (2–18 July 1990) with a short absence on four nights. The number of hours spent for observation varied per evening, in the beginning short, and later longer. When the birds allowed it, I usually observed a maximum of 4–5 hrs per night. On some nights, however, hardly any observations could be made due to heavy rain. Because of these adverse conditions, care was taken not to disturb the feedings of the young. At first the adult owls were very shy and much frightened by torchlight, and refused to approach the young when I was in the neighbourhood. For these reasons some adaptation time was necessary and I only gradually increased the period of observation till the maximum of 4–5 hrs was reached. Moonlit nights (in which torchlight was not needed) were especially favourable for observations. Considerable time was spent in obtaining voice recordings and some photographic documentation. Especially the latter was hard to achieve, because of the steep, broken terrain and luxuriant undergrowth.

Vocalizations were recorded with an Uher 4000 Report IC tape-recorder fitted with a Sennheiser directional microphone (Electrocondensator microphone type ME 88) at a tape speed of 19.5 cm/sec. The sounds were analysed with a Digital Sona-Graph 7800 (Dual Channel Spectrograph) connected with a Sona-Graph Printer 7900, both of Kay Elemetrics Co., Pine Brook, New Jersey, U.S.A.

Geographic names are according to *Atlas Indonesia* by I. Made Sandy (P. T. Dhasawarna & Jurusan Geografie FMIPA, Univ. Indonesia, ed. 6th, 1986). The coordinates given were calculated from survey-maps (1:50,000) of the Dutch East Indies Topographic Service.

The study area

The study site (06°45′S, 106°59′E) was virgin montane rain-forest of the Mt Gede/Pangrango National Park on the NNE slope of this twin volcano at an elevation of *c.* 1500–1600 m. The owls were encountered en route by using an alternative trail (to the east of the main trail) towards the Cibodas Mountain Garden. The site was about halfway between the Cibeureum Falls and the Cibodas Mountain Garden. The virgin forest here had in the upper storey very large trees of *Altingia excelsa* (native name Rasamala, usually up to 40–55 m high and sometimes with a base diameter of 2.5 m), a number of oak species (e.g. *Quercus elegans, Q. pseudo-molucca*), chestnut trees (*Castanopsis argentea, C. tungurrut*), and figs (e.g. *Ficus involucrata*). During the observations the owls and owlets kept mainly to the middle and lower storeys of the forest. The vegetation at this level contained a wide diversity of trees, too many to list; among the commonest were *Villebrunnea rubescens*, two species of *Turpinia (T. pomiflora, T. sphaerocarpa)*, *Saurauia pendula*, numerous *Eugenia* and *Litsea* species, *Euonymus javanicus, Ilex spicata, Olea javanica*, and *Pithecellobium montanum*. At ground level were numerous shrubs and herbs, certainly comprising many hundreds of species. Very conspicuous in this forest

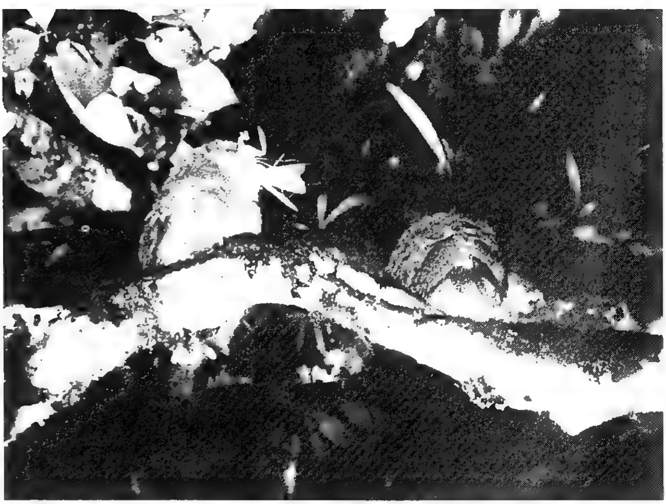

Plate 1. Upper. Active *Otus angelinae* photographed at night shows a round, rather puffed appearance and no ear tufts. It holds a praying mantid (*Hierodula flava*) diagonally between its mandibles.
Lower. *Otus angelinae* adult about to feed a praying mantid (*Hierodula flava*) to its offspring.
Mt Gede/Pangrango, 1600 m, July 1990. Photo: J. H. Becking.

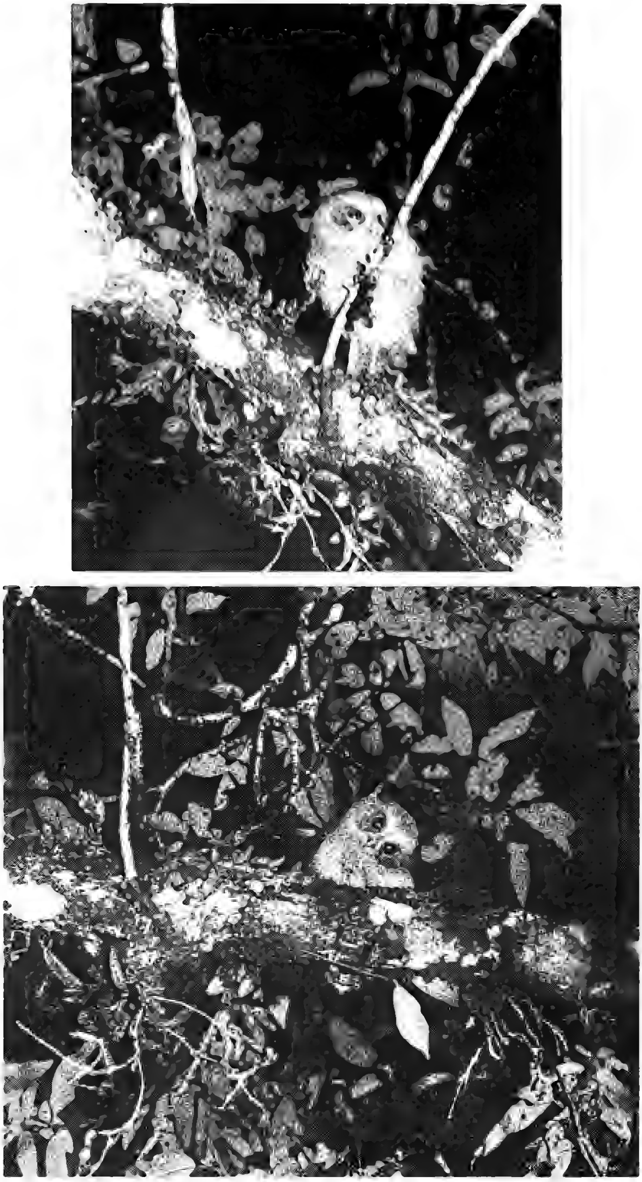

Plate 2. Young of *Otus angelinae*. The larger (upper) and the smaller young (lower) of the same brood.
Mt Gede/Pangrango, 1600 m, July 1990. Photo: J. H. Becking.

type is the occurrence of numerous lianes, especially Vitaceae, and climbing rattan palms (*Calamus* and *Plectocomia* spp.) with long extended leaf rhachides armed with vicious recurved thorns. Climbing pandans (*Pandanus lais*) and a small palm, *Pinanga kuhlii*, are abundant. The branches of trees are usually heavily overgrown with a wide variety of lichens and epiphytes such as orchids, ferns and mosses; epiphytic bird's nest ferns (*Asplenium nidus*) are especially common. The ground layer is thickly covered with dead, partly decomposed, leaves forming an excellent substrate for a wide variety of ferns and ginger species (*Amomum coccineum, Nicolaia solaris*). Plant lists and inventories of this montane rain-forest can be found in Koorders (1914, 1918–23), Seifriz (1923), Meijer (1959) and Yamada (1990).

The climate is cool with an average day temperature of 17°C. In the study period the temperature gradually dropped at night, reaching a minimum of 9–11°C in the early morning (*c.* 5–6 a.m.). The average annual rainfall in this area is 3400 mm and the relative humidity inside the forest is always nearly 90%.

Field observations

Observations on 2–5 July 1990

On 2 July 1990 at 18.30 hrs, at the site detailed above, a hard *tsischschsch-tsischschsch* sound was heard. The hissing sound, repeated every 2–6 seconds, was audible at a distance of at least 40–50 m. When I approached the sound, the beam of my torch revealed two fledgling owlets perching close together (with body contact) on a thick bare bough about 4 m from the ground and 25 m from the trail. The owlets became restless and tried to escape from the light by fluttering to other branches with unhandy clambering movements using their claws and uneasy flapping of their wings. During these movements the yellowish markings on the outer vanes of the primaries and the yellow transverse bands on the underside of the spread tail were very conspicuous. Because of their awkward movements and fluffy appearance, it was obvious that they were fledglings. Their medium size, prominent whitish eyebrow streaks, a russet-brown face mask, and the yellowish markings on primaries and tail, indicated that they were *Otus angelinae*. No ear tufts could be detected. The underparts of the owlets appeared whitish, sparsely transversely barred or vermiculated over the breast with rufous bands of downy feathers. The breast feathers hardly showed the dark vertical blackish-brown shaft pattern known for the adults. The lower abdomen seemed to be nearly immaculate. The tail was very short and did not extend beyond the wings. The tarsi were closely feathered down to the toe-joint, and the toes appeared to be pale yellowish-flesh like the bills. In torchlight their eyes showed up as vivid reddish-brown (the wide open pupil) surrounded by an orange ring (the iris).

One fledgling was considerably larger than the other (Plate 2). It was noteworthy that whenever the fledglings were separated from each other by disturbance, as soon as this was over they tried to come together and often remained together in body contact with one another.

This behaviour continued during the whole fledgling period till they were nearly full-grown. Allopreening was, however, never seen.

The first night of observation (2/3 July) was a rather clear night with only some temporary fog and short periods of fine rain. Because the owls were rather shy and frightened by torchlight, I stationed myself at some distance in order to avoid disturbance or any interruption of the feedings. In complete darkness it was, however, easy to register the frequency of the feedings by the intensive begging and screaming calls of the young.

The owls were completely nocturnal as activity only started after dusk (18 hrs). At the beginning of the evening (*c.* 18.30–19.30 hrs) prey was brought to the two young about 2–4 times in 30 minutes. Between 19.30 and 21.00 hrs the feeding intervals were considerably longer and the young called less frequently and less intensively. After 21.00 hrs there were also periods in which the young were completely silent, and after 23.30 hrs no more calling was heard, although the owlets could still be spotted. As already mentioned, the adults were shy and frightened by the torchlight, and came to the young very reluctantly; in consequence, initially only a brief view of one of the adults could be obtained. This was only accidentally, as the adults were extremely active and alert and continuously changed their position. The short view was, however, sufficient to confirm their identity as *Otus angelinae*, as evident from the vivid golden-yellow iris, conspicuous white-frosted eyebrows, buffy collar on the hindneck, and rufous transversely vermiculated pattern with discrete vertical blotching of the central shafts of feathers on the ventral side. The head showed a prominent round rufous facial disc and the absence of eartufts. Later observations of the adults showed a spherical, rather puffed appearance, a widely spread tail, and no trace of ear tufts (Plate 1). Because of the rather great distance at which these initial observations were made, no information could be obtained on the identity of the prey items.

The weather on the second night (3/4 July) was unfavourable with continuous rain, and I only succeeded in making some sound recordings of the contact call given by the young (Fig. 3), which was accompanied with a continuous rattle of splashing rain-drops on leaves, branches and microphone. However, the following night was exceptionally clear and fine. There was a nearly full moon and the owls could be spotted and regularly followed without the aid of torchlight. From these observations it became evident that the prey brought to the young were mainly large insects, such as beetles (seen as round objects), locusts, crickets, and large stick insects (only seen as long objects). Closer examination was not possible, because of the shyness of the adults and my fear for interrupting the feedings.

When one of the adults arrived with food the normal advertising call of the young, the continuously repeated *tsischschsch-tsischschsch* . . ., increased in pitch and turned into a sort of drawn-out wailing and screaming. Usually only one adult arrived at a perch near the young. However, in view of the sometimes extremely short intervals between successive feedings and the occasional observation of two adults arriving at the same time, of which one waited while the other delivered the food, it was clear that both adults were involved in the feeding process. During this clear night, moreover, two new observations were made. First, when I approached the young in the dark, the adult on a perch gave an explosive and startling disyllabic hoot, *pooo-poo* (Fig. 2A). This call was uttered initially in a rapidly repeated series of 5–6 hoots in half a minute. It seemed to act as an alarm call, produced when the adult was very excited and concerned for the safety of its young. On later occasions this call was again provoked under similar conditions, but was only repeated two or three times. Later on, the call was only very rarely heard, apparently because the owls had become used to my presence.

The second important observation made on this night was that the adults, in trying to lure the owlets away from me by offering the food at some distance, also produced the *tsischschsch-tsischschsch* hissing contact call. Previously I had been uncertain of this, because adults and young were mostly too close to each other to distinguish their voices. As will be discussed later, the sound produced by the adults is somewhat higher in pitch and sounds purer and less scratchy than that produced by the young.

During their attendance by the parents the young regularly moved around, probably following one of the parents, in a radius of 100–400 m from the original spot. As already indicated, after 21.30 hrs the hissing contact calls of the young were produced at longer intervals (once in 4–6 sec), and later in the night they finally gradually faded away. In the early morning (4–5 a.m.), however, there was always some revival in calling and of feeding sessions. With the approach of daylight the hissing calls of the young completely stopped, and without the calls to guide me, I was unable to trace the daytime roost of this pair and their young. I presume that they roosted on a thick limb or bird's-nest fern high up in a tree and were therefore invisible from below.

Later observations

This part of the study was conducted between 9 and 17 July, after an absence of four days. I was able to find the owlets again relatively easily by their hissing sounds during the night; they had moved 300–400 m from the original spot. At this age the size difference between the young was still apparent, but not so great as earlier. At the end of the observation period, nine days later, they appeared to be approximately equal in size; they were then apparently nearly full-grown. About at this age (and some days before), when disturbed by an intruder, the owlets made swaying body movements, sometimes also a curious bending of the body and a swaying of the lowered head.

Since the owlets as well as the adults had become more used to my presence, closer and more detailed observations could be made of the food offered to the young. The young usually beg in a prone posture with quivering wings, calling loudly. The adults generally dismember large prey items such as beetles and the larger winged insects before presenting parts of them to the young. This they do by transferring the prey from the bill to the feet, holding it in the claws, and pulling it to pieces. I could hear the elytra of beetles and wings and other parts of these dismembered insects fall to the ground, but I could never recover them later, even after intensive search, owing to the luxuriance of the ground vegetation. Moreover, I never found ejected pellets, but this might have been expected because the owlets did not stay in one place very long and I did not find their daytime roost. When waiting on a thick limb for food the owlets tended to adopt a somewhat cryptic attitude by assuming a flattened posture along the main axis of the limb or branch.

Prey items

I could finally approach close enough to the owlets to be able to identify the prey items delivered by the adults by sight. Of 21 food deliveries which I could see at close quarters, 4 were large beetles (probably Cerambycidae and Lucanidae, see later), 8 were praying mantids (Mantidae), 1 a stick insect or walking stick (Pseudophasmatidae or Phasmidae), 5 large green long-horned grasshoppers or leaf grasshoppers (Tettigoniidae:Pseudophyllinae and Phaneropterinae), 3 crickets (Gryllidae) or mole crickets (Gryllotalpidae, *Gryllotalpa* sp.). The large percentage (38% of the food) of praying mantids was noteworthy; they are rather inconspicuous by day in such a forest, but are very active at night, making short flights from stem to stem. In doing so they may attract the attention of the owls. The main mantid species involved could be identified to species level; it was *Hierodula flava* (Mantidae:Mantinae) (Plate 1), a green species, rather common in Java. It was also collected near the site of observation as it was attracted by lamp light. At least six of the mantids were this species; one other was a grey-black spotted praying mantid, probably *Theopompa* or *Liturgusa* sp. (Mantidae:Liturgusinae), and one pure white species with a pointed head, a so-called flower mantid, very probably *Hymenopus coronatus* (Mantidae:Hymenopodinae). The Tettigoniid prey were probably *Holochlora* and *Mecopoda* spp. (Phaneropterinae); an apparently identical leaf- or sickle-grasshopper collected at the site was identified as *Holochlora venosa*. The beetles brought were about 2.0–3.5 cm in diameter. Even from a relatively short distance they were impossible to identify to species level as they did not protrude far enough from the beak. Probably they were species of Lucanidae (stag-beetles) and Scarabaeidae (scarab-beetles) as representatives of these groups were regularly seen flying and were trapped by lamp light near the site. A reddish stag-beetle, *Metopodontus cinnamomeus*, and a scarab-beetle, *Xylotrupes* sp., were swarming at that time. *Serrognathus gypaetus*, *Neolucanus laticollis* and *Dichodontus croesus* also occurred very regularly at the site.

With regard to the hunting technique, a few observations indicate that the prey is seized with the claws from a branch, stem, leaf, or even from the ground after the owl's attention is drawn to it by its movements. There was no indication that insects are caught in flight, because when beetles or other apparently suitable insects flew close to the owls, they were ignored. Tettigoniids, a regular prey, are rather sluggish insects, but at night the males tend to produce strident notes with a stridulating organ, which may attract the owls.

The food of the adults is evidently about the same as that offered to the young. Occasionally prey brought to the young was finally eaten by the adults themselves. Mr M. E. G. Bartels Sr. examined the stomach contents of 4 adult specimens of *Otus angelinae* collected by him on the SW side of Mt Pangrango/Gede. He found 3 × (in 3 of the 4 birds) remains of Coleoptera, including once a large long-horned woodboring beetle (Cerambycidae); 2 × earwigs (Dermaptera), especially conspicuous in the stomach contents by their hard, indigestible anal forceps (probably *Cranopygia marmoricrura*, a common species in montane forest); 1 × parts of a large grasshopper (Orthoptera); and 1 × remains of a small reptile or lizard. A young specimen of *O. angelinae* kept by him for 3 months in an aviary took very readily crickets (Gryllidae), when these were offered (M. E. G. Bartels, unpublished diary notes in NNM, Leiden).

Voice

Otus angelinae is generally a very silent owl. I never heard a male's advertising call. In several other encounters with it (see later), I only once at night heard its cat-like hissing call, but never the main call, which seems to be reserved for situations of great stress or alarm (see below). During my study of this pair with their young, four different calls were recorded from the adult owls, and three from the young.

Vocalizations of the adults

Contact call. A cat-like hissing *tch-tschschsch* (or *tsischschsch*), less scratchy, more tonal and usually of higher frequency (6.0–7.5 kHz) and longer duration (0.40–0.51 sec) than the contact call produced by the young (see Fig. 1 and compare with Fig. 3). It was given by the adults when approaching the young or trying to lure them away (see above). Several times both the contact calls of the young and those of the answering adults were recorded at the same time on tape showing clearly the difference in pitch.

Main call of the female. A very explosive and startling disyllabic *pooo-poo* (Fig. 2A). The first note has a duration of 0.25 sec and shows a frequency modulation between 0.5–1.25 kHz; the second note is 0.23 sec with a modulation between 0.5–1.10 kHz. As shown in the sonagram the second note is always lower in pitch than the first note. The interval between the two notes is 0.32 sec. The call is so powerful that the sonagraph produces three overtones reaching a level of 4 kHz with intermediate frequency intervals at about 2 and 3 kHz. This call was produced by the female as a kind of alarm call for defending and warning the young. It was sometimes given in a series of 5–6 two-note calls with intervals of a few seconds; on other occasions it was only repeated 3 or 4 times.

Main call of the male. A much lower and softer *hoo-hoo* (Fig. 2B). I assume that this was the male's call since in other owl species it is usual for the male's call to be lower-pitched than the female's (Cramp 1985, J. T. Marshall pers. comm.). This call was sometimes given during or after feeding the young, apparently as a warning or when danger

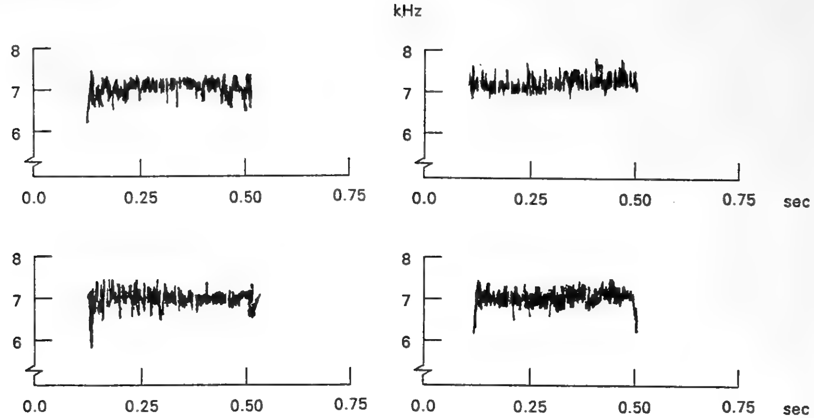

Figure 1. Sonagrams of the contact call of the adults.

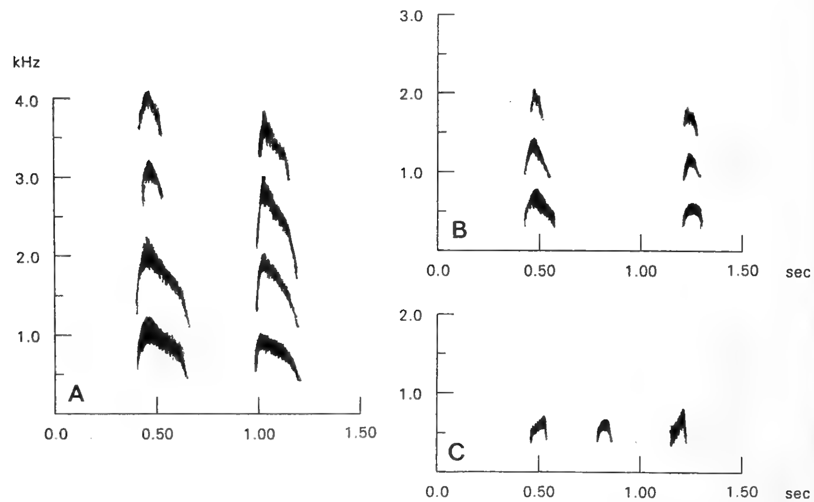

Figure 2. Sonagrams of vocalizations of the adults. A, main call of female; B, main call of male; C, 'comfort call' of the male, when he comes to the young.

threatened. The male and female calls were never heard in association, i.e. as a duet. They were always uttered independently of each other on various occasions on different days, but in rather similar situations. The frequency range is between 0.25–0.75 kHz, the first and the second note have a duration of 0.18 and 0.10 sec, respectively; their interval is 0.60 sec. As evident from the sonagram it has the same structure as the main call of the female. The second note is usually lower in pitch than

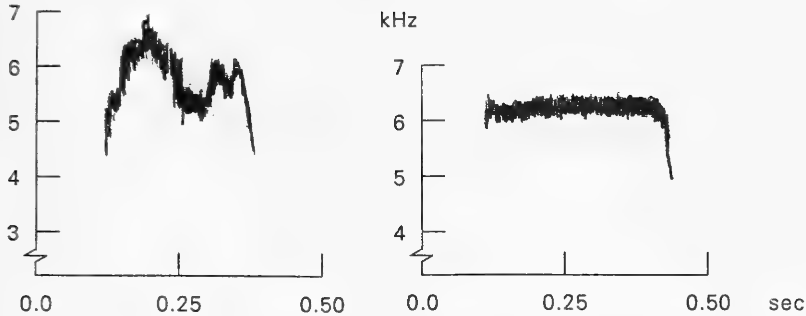

Figure 3. Sonagrams of the contact call of the young of *Otus angelinae*. Left, 'scratchy'; right, more 'smooth'.

the first, but rarely may be of about the same pitch. The male call is, however, far less powerful and explosive than that of the female. Consequently, only two overtones are produced reaching to about 2.0 kHz.

Peace or comfort call. A low, soft *wook-wook-wook* (Fig. 2C). This call was sometimes uttered by the male during pauses in the feeding of the young or after feeding. Its frequency spectrum is between 0.3–0.75 kHz. The call lasts only 0.77 sec, and each note has a duration of 0.08–0.15 sec, with intervals of 0.3 sec.

Vocalizations of the young

Contact call. A hissing *tch-tschschsch* (or *tsischschsch*), of surprisingly constant duration (0.31 sec, very seldom a fraction longer). Its pitch and timbre, however, may vary. It is usually more or less scratchy, as apparent from the rather great frequency modulations in the sonagram (Fig. 3, left), but sometimes it can also be more tonal and therefore smooth (Fig. 3, right). Time measurements obtained from tape recordings made in the early evening (18.30 hrs) indicate that the contact call was repeated 16 times in 30 seconds giving an average interval of 1.9 sec between each phrase. The intervals between the calls were, however, irregular, ranging from 1 to 4 sec. As two fledglings were involved in this recording, the average interval between the calls of one bird is *c.* 4 sec. At about 21.00 hrs 10 calls were recorded for two fledglings in 30 seconds (average interval 6 sec per bird), and later in the evening the frequency of calling still further decreased, as already described. On one occasion when the fledglings were separated from each other, one of them called 14 times in one minute (at 20.15 hrs).

Food calls. When the young are approached by the parents to be fed, the contact call changes, usually gradually, into a screaming begging call, usually somewhat higher in pitch and of longer duration (usually 0.47–0.66 sec; Fig. 4). Sometimes, however, the begging calls are more prolonged (1.1–1.4 sec; Fig. 5), probably because the food is first dissected before it is offered to the young. During the feeding process

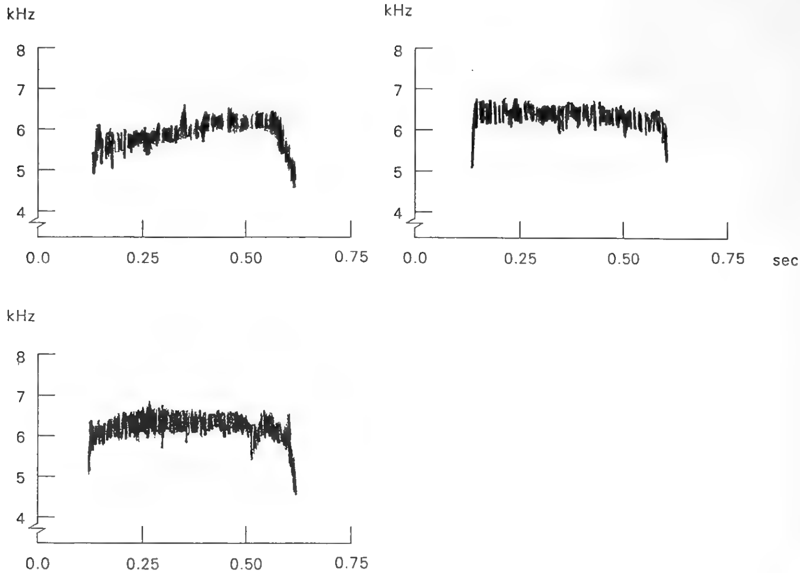

Figure 4. Sonagrams of food calls of the young owlets.

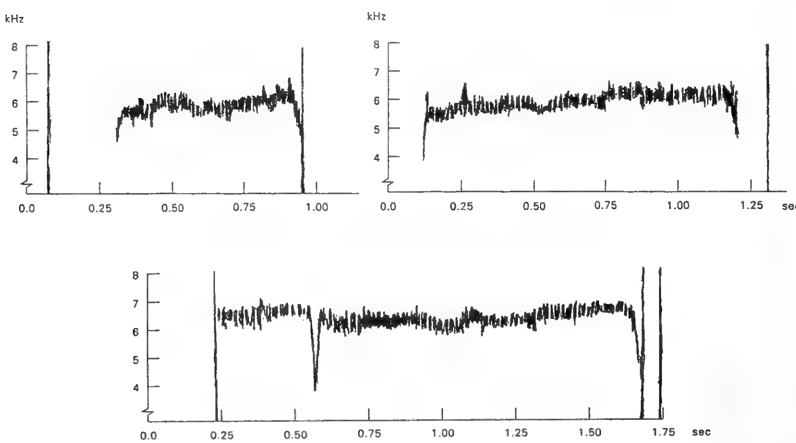

Figure 5. Sonagrams of extended begging calls of the young, showing in addition bill-snapping (vertical lines) of the young.

and just before and after it, bill-snapping can often be heard. The bill-snaps are audible to the human ear as dry clicks and appear in the sonagrams as vertical lines extending to *c.* 8 kHz (Fig. 5). Very probably the bill-snaps were produced only by the young, as bill-snapping occurred only during feeding and more frequently when the young were very hungry, i.e. at the beginning of the evening. Under these conditions it may occur in rather rapid succession at intervals of 0.1–0.3 sec.

Twittering. A fast twittering or chittering *gick-gick-gick* is often produced by the young before and during feeding. It sounds rather similar to the twittering sound of young Barn Owls *Tyto alba* and some other owl species, also some swifts (e.g. *Hydrochous gigas*), when being fed.

Other records

Table 1 lists the localities, in order from west to east, from which *Otus angelinae* is known. Apart from the observation of Andrew & Milton (1988) and my observations discussed in this paper, all field records refer to single birds at daytime roosts or in places where they have perched after being disturbed. According to my experience the Javan Scops Owl usually perches with little concealment on a bare branch of a tree *c.* 3–5 m high, but occasionally much lower at *c.* 1–2 m above the ground (see Frontispiece). They apparently rely completely on their camouflage. Active birds at night never showed signs of ear tufts, but roosting birds by day exhibit very pronounced long ear-tufts, which they are able to raise vertically if they are aware of being watched or approached by man. In this concealing attitude, the so-called sleeked-upright posture, the body is stretched upward with feathers sleeked and half-closed eyes. In this tense posture their camouflage is very effective, and one may very easily pass these owls at close range without noticing them.

Breeding

There are three records of the breeding of *Otus angelinae*, all of recently fledged young; one on 4 February 1985 (Andrew & Milton 1988); one on 2 July 1990 (this paper); and a record of a recently fledged young brought to M. E. G. Bartels (Pasir Datar, SW slope Mt Pangrango) at the beginning July 1921, which was kept by him for 3 months in an aviary, before it died (25.9.1921, NNM 45836). Based on the incubation period (24–25 days) and the fledging period (average *c.* 25 days) of the Palaearctic *Otus scops* of about the same weight and size (Koenig 1973, Cramp 1985), the approximate laying dates of the eggs of *O. angelinae* can be calculated. For the two July records the estimated laying date of the eggs is the 2nd week of May (*c.* 10–12 May) and for the February record the 2nd week of December (*c.* 12–14 Dec). These three records, however, do not justify a conclusion about a breeding season. There may be two peaks, one long season, or irregular breeding all year round. The size differences of the two young studied in this paper indicate asynchronous hatching, which is also known for other scops owls, including *Otus scops*, and for some other owl species. In the two *Otus angelinae* fledglings observed, I estimate that the egg-laying interval must be at least 3–4 days. The nest site of the owls

TABLE 1
Records of *Otus angelinae*

Locality	Altitude (m)	Dates	Collector/observer
Mt Salak (NNE slope, Ciapus valley, 6°41′S, 106°44′E)	*c.* 1200	Jul 1977 Oct 1987	J. H. Becking (sight records, single birds)
Mt Pangrango, SW slope (type-locality, 6°46′S, 106°56′E)	*c.* 1830	25.08.1911	M. E. G. Bartels (collected specimen)
Mt Pangrango, SW slope (type-locality, 6°46′S, 106°56′E)	*c.* 1830	20.09.1920	M. E. G. Bartels (collected specimen)
Mt Pangrango, SW slope (Pasir Datar, 6°50′S, 106°53′E)	1000–1500	24.04.1916 25.09.1921 24.07.1922 19.09.1926	M. E. G. Bartels (collected specimen) M. E. G. Bartels (collected specimen) M. E. G. Bartels (collected specimen) M. E. G. Bartels (collected specimen)
Mt Gede-Pangrango, NNE slope (Cibodas, 6°44′S, 106°59′E)	1450	1969–70	M. Toha (25–26 Nov 1969, 15–18 Dec 1970; 4 birds netted, 2 each year; one collected)
Mt. Gede-Pangrango, (Mt Gede-Pangrango National Park, 6°45′S, 107°00′E)	1500–1900	Oct 1971 Oct 1977 Jul 1983 4.02.1985 Jul 1990 Jul 1991	J. H. Becking (sight record, single bird) J. H. Becking (sight record, single bird) J. H. Becking (sight record, single bird) P. Andrew & G. R. Milton 1988 (sight record, 2 juveniles) J. H. Becking (sight record, present paper) J. H. Becking & M. Ruedi (sight record, single bird, see Frontispiece)
Mt Tangkubanperahu (NE slope, Ciater, 6°45′S, 107°37′E)	1800	1.11.1953	M. van Balgooy (collected specimen)
Mt Ceremay (W slope, Apuy, 6°45′S, 108°21′E)	1100	28.1.1930	J. J. Menden (collected specimen, ex collection H. C. Siebers)
Ijen Highlands (SE side, Sodong Jerok, 8°07′S, 114°14′E)	1170	28.3.1916	H. C. Robinson & C. B. Kloss (collected specimen—formerly identified as *O. brookii*)

Note: Except Toha's specimen and the Ijen Highlands specimen which are in MZB (Bogor), all other collected specimens are in NNM (Leiden).

was not found. One may speculate that it may be a tree hole or on the top of a bird's nest fern (*Asplenium nidus*). The latter cannot be excluded as E. Bartels (pers. comm.) twice flushed a female bird from such a site on the SW slope of Mt Pangrango (Bartels collection, NNM 45837 & 45838). The full clutch of *Otus angelinae* probably consists of two eggs, like *Otus bakkamoena* and most other small owls of this region.

Summary

Otus angelinae is an elusive and a rather silent denizen of the submontane and montane forest on Java; it is a Javan endemic, and its biology and voice were unknown. The present paper describes for the first time the voice and the behaviour of the adults and the young during their post-fledging period. Several types of vocalization of adults and young were recorded. The most prominent call is that of the female, an explosive double-hoot *pooo-poo*. This call is much louder and at a higher pitch than that of the male. Both adults and fledged young produced a hissing cat-like contact call. The food calls of the young and those during feeding were also recorded. The owls were studied for 17 successive nights, near the end of which they probably became independent. The behaviour of the adults and the food offered to the young are described. Prey items were insects, mainly Orthoptera:Mantidae (praying mantids) and Tettigoniidae (long-horned or leaf grasshoppers), and some Coleoptera, probably Lucanidae (stag-beetles), Scarabaeidae (scarab-beetles) and Cerambycidae (long-horned wood-boring beetles). The first photographic records of the adults and young of this species are presented.

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Subspeciation in *Erythropygia coryphoeus* (Vieillot) of the Southwest Arid Zone of Africa

by P. A. Clancey

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The Karoo Scrub-Robin *Erythropygia coryphoeus*, which has recently had the authorship of its scientific binomen adjusted from *Sylvia coryphaeus* Lesson, 1831, to the earlier *Sylvia coryphoeus* of Vieillot, 1817, following the findings of Rookmaaker (1989)—see also Brooke & Clancey (1990)—is a small sombrely coloured endemic robin of karoo scrub and acacia thickets of the southern parts of the Southwest Arid Zone of the Afrotropics. It is distributed from south-central Namibia from the Naukluft National Park and the northern Cape, south to the entire Cape south of the Orange R., extending east to the western limits of the Transkei at Cofimvaba (Quickelberge 1989), the western lowlands of Lesotho and the drier west of the Orange Free State to about 28° E. There is little evidence that it is other than mainly sedentary. It is closely allied to another scrub-robin, *Erythropygia paena* (Smith), with which it is sympatric from the basin of the mid-Orange R. northwards. The two species are in the main allopatric, but their ranges overlap widely in association with the transition of plant community facies from karroid type to the *Acacia*/grass country complex of the Kalahari ecosystem. There is no evidence that the species hybridize in their zone of sympatry where they are often to be encountered on the same ground. Their joint distribution pattern suggests that *coryphoeus* resulted from a primal colonising event and *paena* from a later one, the staggered radiation also involving the Rufous Scrub-Robin *E. galactotes* of the Palaearctic and the arid parts of the northern Afrotropics.

Many workers now merge the genus *Erythropygia* Smith, 1836, spp., with *Cercotrichas* Boie, 1831, the sole species of which is *Cercotrichas podobe* Boie, 1831; but Ripley (1964), Wolters (1980) and Dowsett & Dowsett-Lemaire (1993) recognise the two genera, with *Cercotrichas* monotypic and *Erythropygia* polytypic. It was decided to follow likewise and view *coryphoeus* as a constituent species of the genus *Erythropygia*, with *E. paena* as unquestionably congeneric, as is *E. galactotes*.

As shown by Macdonald (1952), variation in the present scrub-robin, initially believed to be sexually based, was first detected by Levaillant (1801–04), but it was not until the publication of Macdonald's findings that the true nature of such variation was shown to be ecologically and geographically rather than sexually linked. Macdonald also concluded that at that stage it was desirable to recognise only a relatively grey race of the desertic coastlands of the western and southwestern Cape, induced climatically by the influence of the cold water inshore upwelling of the Benguela Current, and a browner interior complex of populations. He treated the first as *E. c. cinerea*, a new subspecies, and the rest as comprising the nominate race, but recent study based on the ample fresh material now available in southern African museum collections has shown the desirability of recognising it as a form confined to the Karoo biome, the populations occurring both to the north and northeast of it attributable to two other subspecies. These are *E. c. abbotti* in the Kalahari/Karoo ecosystem transition in the west, and *E. c. eurina* Clancey, 1969: Glen, Modder R., Orange Free State, of the eastern plateau grasslands of the South African Subregion.

Prior to the publication of Macdonald's findings, *E. coryphoeus* had already been shown as probably polytypic by Friedmann's naming of *E. c. abbotti* from the Great Fish R., Great Namaqualand, Namibia, in 1932, which sometime later was shown to have been proposed on individual rather than geographic variation in the size of the white tips to the rectrices. While treated as synonymous with the nominate race (see Clancey 1959 and 1980), a re-examination of virtually all the material in south-African collections (some 328 specimens in all) shows that the xeric populations present in southern Namibia and the lower basin of the Orange R. should be kept separate from those of both the Karoo and the eastern grasslands of the species' range. On the basis of revised plumage characters and determination of a precise range, *E. c. abbotti* can be justifiably resuscitated as indicated above.

Of the brownish populations of the Karoo Scrub-Robin, the darkest are those of the Karoo biome, these being replaced to the north and north-east by lighter birds with the breast markedly paler. Of these differentiates, the southern Namibian and lower Orange R. birds are distinguishable from the ones occurring in the eastern Grassy Karoo, *E. c. eurina*, by the more extensively white throat, the still paler breast and less reddish flanks, but with the tertials, secondaries and wing-coverts markedly edged with tawny. It is significant that the combined ranges of *abbotti* and *eurina* encompass much of the zone of *E. coryphoeus* and *E. paena* overlap, which extends west to east from Namibia and the northern Cape to 28° E. in the Orange Free State.

TABLE 1

Wing-, tail- and culmen-lengths (mm) of the four subspecies of the Karoo Scrub-Robin *Erythropygia coryphoeus*

			n	Range	Mean	s.d.
E. c. cinerea	♂	Wing	10	68–77.5	73.5	3.40
		Tail	10	62–72	67.0	3.73
		Culmen	10	16–18	17.1	0.74
	♀	Wing	10	65–71.5	68.9	1.86
		Tail	10	62.5–72	66.9	3.74
		Culmen	10	15.5–17.5	16.6	0.66
E. c. coryphoeus	♂	Wing	10	68–77.5	74.3	2.85
		Tail	10	63.5–75	71.5	3.34
		Culmen	10	16–18	17.3	0.75
	♀	Wing	10	70–81	74.7	3.45
		Tail	10	65–73.5	70.5	3.46
		Culmen	10	15.5–18	16.8	0.78
E. c. abbotti	♂	Wing	10	74–81	76.3	2.12
		Tail	10	70–76.5	72.9	2.31
		Culmen	10	16–17.5	17.0	0.57
	♀	Wing	10	70–80	73.9	3.84
		Tail	10	67–76	70.5	2.76
		Culmen	10	16–18	17.2	0.63
E. c. eurina	♂	Wing	10	73.5–78	76.1	1.66
		Tail	10	68.5–76	72.1	2.08
		Culmen	10	16–17.5	16.8	0.48
	♀	Wing	10	70–75	72.2	1.53
		Tail	10	68–76	70.4	2.29
		Culmen	10	16–18.5	17.4	0.73

Note. E. coryphoeus exhibits little in the nature of clear-cut geographically related size-variation, the largest birds occurring in the populations of *E. c. abbotti* in Namibia and adjacent areas in which males and females have wings to 80 mm and above. The smallest birds crop up in the maritime populations of *E. c. cinerea* and *E. c. coryphoeus* in the western and southern Cape. In all four races males average larger than females, but with much overlap in both wing and tail measurements.

Four subspecies of the Karoo Scrub-Robin can be recognised, as follows; see also Table 1 and Figure 1.

Erythropygia coryphoeus cinerea Macdonald, 1952: 26 km N. of Port Nolloth, northwestern Cape.

Dorsal head and hind-neck greyer than in *E. c. coryphoeus* (greyish Mummy Brown; Ridgway 1912), the mantle and scapulars still duller and greyer. On under-parts with the fore-throat more broadly white; entire breast and side light neutral grey, the caudad feathers narrowly fringed white. Wings in adults with light brown edging to tertials, secondaries and coverts. Tail browner black than in nominate *E. coryphoeus*. Material examined: 74, including *E. c. cinerea*$\gtrsim$*E. c. coryphoeus* intergrades.

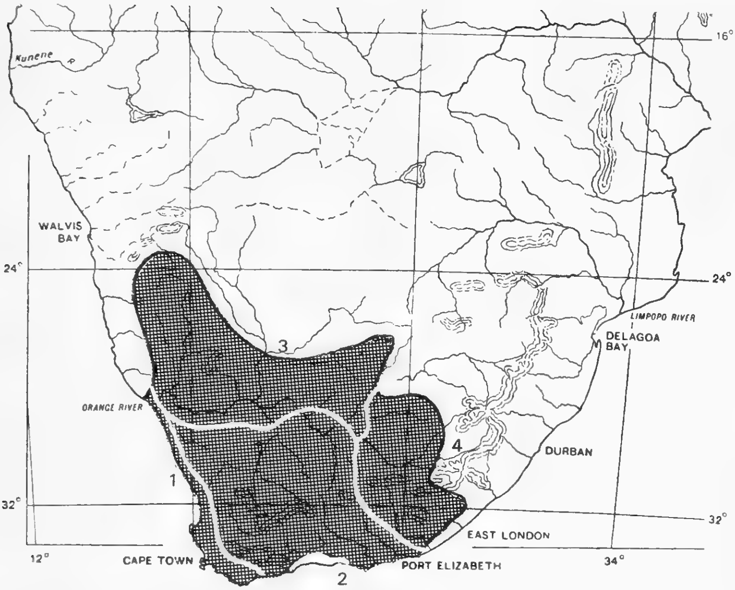

Figure 1. Sketch-map of the Southern African Subregion showing the distribution of the Karoo Scrub-Robin and the disposition of its four subspecies: 1, *Erythropygia coryphoeus cinerea*; 2, *E. c. coryphoeus*; 3, *E. c. abotti*; 4, *E. c. eurina*.

Range. Extends narrowly along the coast from southwestern Namibia and the mouth of the Orange R. to the coastlands of Little Namaqualand, Cape Province, south to the Cape of Good Hope, thence southeast to Cape Agulhas and the Bredasdorp district. Intergrades irregularly with nominate *coryphoeus* to the east of the given range. Habitat: dry scrub of desertic coast on whitish sands; rainfall <120 mm.

Remarks. Racial intergrades were examined from Klipfontein, Springbok, Kamieskroon, Kliprand, Vanrhynsdorp, near Bredasdorp and elsewhere. Coastal dune-scrub material of *cinerea* tends to be often badly bleached and eroded through direct contact with wind-borne salt spray. Wings may be bleached white.

Erythropygia coryphoeus coryphoeus (Vieillot), 1817: Uitenhage district, southeastern Cape.

In fresh dress (April–July) with pileum and hind-neck dark greyish Olive-Brown; mantle and scapulars near Saccardo's Umber with grey patina; malar-streaks and sides of lower throat darkish medium grey, this diffused caudad over most of the breast; flanks buffy and ventral streak to under tail-coverts pale buff. White fore-throat laterally constricted. Tail black and wings dark brown, with light brown edging to flight-feathers and coverts. Material examined: 145.

Range. Cape immediately east of *E. c. cinerea* from Little Namaqualand and the Succulent Karoo, south to the southern Cape, extending eastwards through the Karoo biome to West Griqualand in the north-east and adjacent southwestern Orange Free State (at Luckhoff and near Smithfield), Colesberg in the north-eastern Cape, and south reaching the Sundays R. drainage and about Uitenhage in the southeast. Habitat: Karoo; Rainfall 120–500 mm.

Remarks. The occurrence of the present subspecies in the southwestern parts of the Orange Free State and adjacent northeastern Cape on the Orange R. may be a result of localized eastwards spread of the Karoo biome stemming from poor farming practices in that part of South Africa in recent times. A variable subspecies, and like *cinerea* much affected by solar bleaching and plant erosion, but not whitening as in the case of the aforesaid race. The strong wash of grey to the lower sides of the neck and upper breast and very dark upperside in fresh condition readily distinguish it from the adjacent *E. c. eurina*.

While generally conceded as sedentary, some individuals of the present race may extend north of the breeding grounds in winter, as suggested by a characteristic adult of the present race taken at Maltahöhe, Namibia, on 2 June 1971 (South African Museum collection), but alterations made to the label indicate the possibility of an error in its data.

Erythropygia coryphoeus abbotti Friedmann, 1932: 16.1 km from Berseba, Great Namaqualand, Namibia.

Lighter and buffier brown than *E. c. eurina* (see below), the pileum and hind-neck lighter, and back, rump and wings more ochraceous-brown. Below, with a broader white fore-throat streak, and sides of neck and entire breast virtually plain buffish, without the grey present in *eurina*, and mid-venter, crissum and under tail-coverts buffish rather than white. In wings, tertials, secondaries and coverts often edged Tawny-Olive. Material examined: 44. *Namibia*: Oranjemund, Ai-Ais, Seeheim, Keetmanshoop, Maltahöhe, Helmeringhausen, Berseba, Bethanien, Assab, Groot Nabbas; *Cape*: Holgat R., Kuboes, "Hell's Kloof" (Richtersveld), Blomhoek (Bushmanland), Pofadder, W. of Upington, Buchuberg, Kenhardt, Kuruman, Vryburg.

Range. Central and southern Great Namaqualand from the Naukluft National Park to the lower Orange, and north-western Cape in the Richtersveld and Bushmanland, east north of the river as far as Kuruman and Vryburg. Intergrades to the south of its range with *E. c. coryphoeus* and *E. c. cinerea*. Habitat: Semidesert/dry Kalahari savanna. Rainfall 0–250 mm.

Remarks. The characters given for this taxon by its describer were simply those of individual variation in a limited sample.

Erythropygia coryphoeus eurina Clancey, 1969: Glen Lyon Farm, Glen, Orange Free State.

Compared with *E. c. abbotti*, the pileum and hind-neck are much darker (about Sepia), the rest of dorsum and wings less markedly ochraceous, but not as dark and earthen brown as in nominate *coryphoeus*. On underside, with a narrow white fore-throat streak, much as in *coryphoeus* from which it differs in having the breast, sides and flanks light vinaceous-cinnamon without a greyish patina, the ventral grey light and restricted to the malar streaks. Mid-ventral surface to the under tail-coverts white. Material examined: 65.

Range. Northeast and east of nominate *coryphoeus* of the Karoo biome, extending from the headwaters and immediate east of the Great Fish R. in the east of the Cape to the Orange Free State, except for the southwestern corner, to 28°E, the lowlands of northern and western Lesotho and to western Transkei (at Cofimvaba). Habitat: mainly grassveld/karoo transition (=Grassy Karoo); rainfall >250–1000 mm.

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For the loan of material to augment that already available in the collection of the Durban Natural Science Museum I am grateful to the responsible officials of the South African Museum, Cape Town; the East London Museum; the National Museum, Bloemfontein; the Transvaal Museum, Pretoria; and the State Museum of Namibia, Windhoek. To all concerned I express my thanks.

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First records of *Tangara cyanicollis melanogaster* from Bolivia

by *Curtis A. Marantz & J. V. Remsen, Jr.*

Received 24 August 1993

Our examination of specimens of the Blue-necked Tanager *Tangara cyanicollis* collected recently from the Serranía de Huanchaca region in northeastern Dpto. Santa Cruz, Bolivia (Bates *et al.* 1992), indicates that they are referable to *T. c. melanogaster*, previously known only from northern Mato Grosso and southern Pará, Brazil (Isler & Isler 1987). Nine specimens were collected at five localities, all Prov. Velasco, Dpto. Santa Cruz: Serranía de Huanchaca, 21 km SE Catarata Arco Iris, 670 m (2); Serranía de Huanchaca, 46 km E Florida, 725 m (1); 13 km SW Piso Firme, 230 m (3); 10 km SSW Piso Firme, 230 m (1); and Parque Nacional Noel Kempff Mercado, 86 km ESE Florida (2).

These Bolivian specimens show the combination of points noted by Cherrie & Reichenberger (1923) to be diagnostic of *T. c. melanogaster*. Like specimens examined of *T. c. melanogaster* collected near the type locality in Mato Grosso (Tapirapoan, AMNH 127201 and 128219; Doze Octobre, AMNH 128224), the Bolivian individuals have entirely black underparts (although LSUMZ 15189, a female, shows a slight purplish-blue cast on a few flank feathers), a "strong indigo blue tinge on the middle of the throat", and a decidedly golden wing-covert panel. The birds additionally have a variable amount of blue on the rump and a purplish cast to the forehead, both characters that Cherrie & Reichenberger (1923) suggested can be used to distinguish *T. c. melanogaster* from *T. c. hannahiae* of northern Colombia and Venezuela.

Specimens (LSUMZ 67791–67793) collected in the vicinity of Serra do Cachimbo, Pará, Brazil, over 500 km northeast of either the Mato Grosso or the Bolivian localities, differ slightly from the other specimens that we examined of *T. c. melanogaster* in having a clearer blue throat and forehead, with a reduction in the purple tinge. Because two of these specimens are females with prominent black centres to the crown feathers, potentially indicating immaturity, the significance, if any, of these differences cannot be assessed without additional material.

The Bolivian specimens of *T. c. melanogaster* represent a westward range extension of about 90 km from the nearest locality in Mato Grosso, and were collected approximately 275 km from the type locality of *T. c. melanogaster* at Utiarity, Mato Grosso. The range of lowland *T. c. melanogaster* is still separated from populations of *T. cyanicollis* in the Bolivian Andes by 450 km. The intervening region remains poorly sampled, except for the region around Concepción, Prov. Ñuflo de Chavez, Dpto. Santa Cruz, where Davis (1993) did not find this or any other species of *Tangara*; more tropical areas to the north where *Tangara* would be more likely have yet to be sampled.

Tangara cyanicollis has a unique geographic distribution. Although at first glance it might be categorized as Circum-Amazonian (Remsen *et al.* 1991), its lowland distribution is north of that of Circum-Amazonian species and does not include southeastern Brazil, and its montane distribution is really more in the tropical zone foothills of the Andes than in true montane cloud-forest. Elevations for specimens taken near the Andes in Peru and Bolivia are mainly 300–1300 m (LSUMZ specimens), generally below those of humid montane cloud-forest.

Tangara cyanicollis melanogaster joins a growing list of bird taxa formerly endemic to southwestern Brazil that have now been found in extreme northeastern Bolivia (Bates *et al.* 1989, 1992; Kratter *et al.* 1992).

Acknowledgements

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Additional information on the birds of Guerrero, Mexico

by Steve N. G. Howell & Sophie Webb

Received 24 August 1993

The avifauna of the state of Guerrero, like that of many areas in Mexico, is relatively little-studied. Griscom (1934) discussed an extensive collection of specimens from the state, obtained by the veteran collector W. W. Brown between 1930 and 1932, and also gave a summary of earlier ornithological work in Guerrero. Further information on the state's avifauna has been provided by Griscom (1937), Davis (1944), Blake (1950), Dixon & Davis (1958), Navarro (1986), Howell & Wilson (1990), Howell (1992), Navarro (1992), Navarro *et al.* (1992a), Webb & Howell (1993), and Howell & Engel (1993). Friedmann *et al.* (1950) and Miller *et al.* (1957) provided a simple listing of species recorded from Guerrero.

We visited Guerrero to observe birds for a total of 26 days as follows: 18–19 December 1984 (SNGH and P. Pyle), 14 December 1985 (SNGH and R. G. Wilson), 2–3 June 1986 (SNGH and R. G. Wilson), 4 January 1987 (SNGH and SW), 11–18 April 1988 (SNGH and SW), 22–24 March 1990 (SNGH and R. G. Wilson), 20–25 May 1990 (SNGH and SW), 7–9 October 1993 (SNGH).

We here summarize observations of 44 species that supplement the information available on the avifauna of Guerrero, including 20 species previously unreported from the state. We also provide supporting evidence for one species whose occurrence in Guerrero has been questioned, and question the occurrence of two species traditionally attributed to the state's avifauna. Our observations refer largely to the humid, coastal-facing slopes of the Sierra Madre del Sur (or Sierra de Atoyac), although we report some records from the coastal lowlands and interior of Guerrero.

Most of the information on Guerrero has been based on collections centred on the capital Chilpancingo, on the famous locality of Omiltemi high in the Sierra Madre del Sur, and in the vicinity of Acapulco on the coast. The coastal-facing slopes of the Sierra Madre del Sur have remained largely unstudied, although visited briefly by collectors, e.g. Chester C. Lamb who, in 1947, discovered the distinctive and still little-known Short-crested Coquette *Lophornis brachylopha* (Moore 1949, Howell 1992). Navarro (1986, 1992) analysed the altitudinal distribution and ecological characteristics of bird species on the coastal slope of the Sierra Madre del Sur in Guerrero, based on 90 days of field work between March 1983 and May 1985. While he made a significant contribution, many species not detected simply by mist-netting were overlooked. For example, in a total of 11 days in April 1988 and March and May 1992 we visited areas corresponding to three of Navarro's (1986, 1992) eleven study sites and recorded 48 species not found by him. Navarro (1986, 1992)

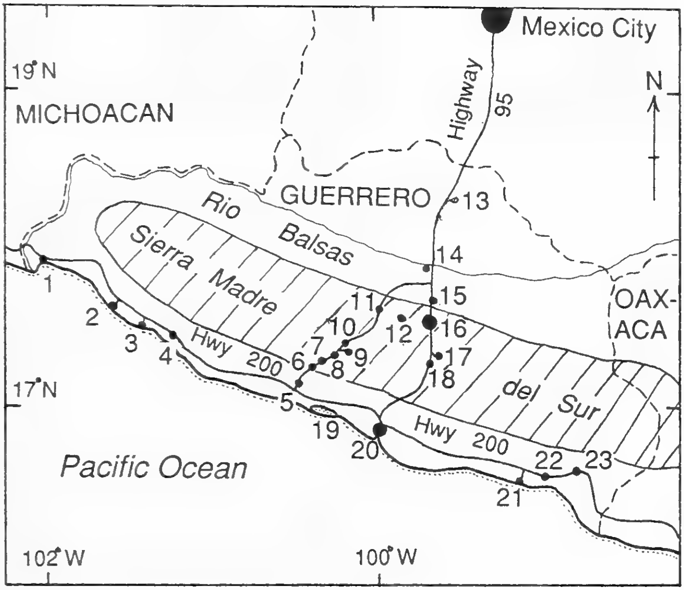

Figure 1. The state of Guerrero, Mexico, showing places mentioned in the species accounts. 1, Petacalco; 2, Zihuatanejo; 3, Barra de Potosi; 4, Petatlan; 5, Atoyac; 6, Rio Santiago; 7, San Vicente de Benitez; 8, Paraiso; 9, Arroyo Grande; 10, Nueva Delhi; 11, Filo de Caballo; 12, Omiltemi; 13, Laguna de Tuxpan 14, Mexcala; 15, Zumpango del Rio; 16, Chilpancingo; 17, Acahuizotla; 18, Agua de Obispo; 19, Laguna Mitla; 20, Acapulco; 21, Laguna Chautengo; 22, Marquelia; 23, Juchitan.

listed 162 species and thus overlooked at least 23% of the potential avifauna.

Certainly, much remains to be learned about the avifauna of Guerrero, one of the most ornithologically diverse states in Mexico. The following accounts convey new distributional information and for some species provide an idea of relative abundance, since essentially no data are available on this subject for the state of Guerrero. Elevations of occurrence for presumed breeding species in the Sierra Madre del Sur are given to the nearest 50 m. The notation NG indicates species for which we have found no previously documented record for the state. Figure 1 shows localities mentioned in the species accounts.

THICKET TINAMOU *Crypturellus cinnamomeus*

Friedmann *et al.* (1950) described this tinamou as a fairly common resident in western Mexico, from Sinaloa to Guerrero. Navarro (1992), however, described this species as "rare" ("seen only once or twice in the entire study"). We heard up to 8 Thicket Tinamous per day between San Vicente de Benitez and Paraiso (900–1000 m) in Apr 1988, and up to 10 per day in Mar and May 1990, supporting the evaluation of Friedmann *et al.* (1950).

EARED GREBE *Podiceps nigricollis*

We have two records of this species from Guerrero: 6 birds along the Guerrero side of the Rio Balsas near its mouth, where it forms the state border with Michoacan, 18 Jan 1984, and one bird in alternate plumage at Laguna de Tuxpan, 2 Jun 1986. NG.

WESTERN/CLARK'S GREBE *Aechmophorus occidentalis/clarki*

The southernmost breeding site for both of these grebes is Laguna de Tuxpan. No data appear to be available on the population size or proportion of the two forms there beyond two "dark phase" (i.e., Western) and four "light phase" (i.e., Clark's) specimens reported by Dickerman (1973). On 2 Jun 1986 Howell counted 360–400 *Aechmophorus* grebes on Laguna de Tuxpan; the 50 closest birds were 28 Western and 22 Clark's. On 20 May 1990 we counted 165+ *Aechmophorus* grebes at the lake, of which all but one Western were too distant for specific identification.

KING VULTURE *Sarcoramphus papa*

On 23 May 1990 we saw an adult King Vulture soaring over the road 3 km north of San Vicente de Benitez, and a single and two adults over the road 2–5 km south of San Vicente (900–1000 m). The King Vulture has been reported rarely from west Mexico, with records from Sinaloa and Nayarit (Freidmann *et al.* 1950) and from Colima (Schaldach 1963); surprisingly there appear to be no records from the Pacific slope of Oaxaca west of the Isthmus of Tehuantepec (Binford 1989). NG.

WHITE-TAILED KITE *Elanus leucurus*

The only record we have from Guerrero of this conspicuous raptor is one seen on 18 Jan 1984 along the coastal highway between the Michoacan border and Acapulco. NG.

SNAIL KITE *Rostrhamus sociabilis*

The early morning of 18 Apr 1988 we watched an adult male and three female or immature Snail Kites feeding at the ponds south of Highway 200, a few km east of Juchitan. At 08.40 all four kites circled up from the ponds and drifted overhead off to the east. This is the only Pacific slope record of Snail Kites we are aware of west of the Isthmus of Tehuantepec in Oaxaca where the species is described as a "rare spring and summer visitant" (Binford 1989). NG.

DOUBLE-TOOTHED KITE *Harpagus bidentatus*

Dixon & Davis (1958) reported two specimens of this species from the Sierra Madre del Sur of Guerrero, in Jul 1941 and Jun 1954, although AOU (1983) overlooked these records. We observed an adult Double-toothed Kite perched in a tree by the road 1 km north of Rio Santiago (1000 m), 23 May 1990. This species appears to be an uncommon and local resident in western Mexico, and also has been found recently in Jalisco and Colima (Howell, pers. obs.).

SHORT-TAILED HAWK *Buteo brachyurus*

Although Friedmann *et al.* (1950) listed no records from Guerrero, and Peterson & Chalif (1973) described Short-tailed Hawk as "rare, local" in Mexico, this species, with which we are very familiar, is one of the commonest hawks on both slopes of Mexico (pers. obs.). Our records from Guerrero whence, remarkably, there appear to be no previous published records, include 37 dark and 22 light morphs at numerous sites in the coastal lowlands and coastal-facing slopes of the Sierra Madre del Sur, from sea level to 1600 m elevation (localities 1, 2, 4, 5, 7, 8, 9, 20, 22, and 23 on Fig. 1). We have records in Jan, Mar, Apr, May and Oct. NG.

BLACK HAWK-EAGLE *Spizaetus tyrannus*

Howell saw two birds, calling and soaring, 2.5 km north of San Vicente, on 7 Oct 1993. One bird flew as low as 100 m over the road and all features, including the bushy, white-based crest and black-and-white feathered tarsi could be seen clearly. Webb & Howell (1993) reported the only prior record of this unmistakable species from Guerrero where it appears to be an uncommon resident in the Sierra Madre del Sur.

BARRED FOREST-FALCON *Micrastur ruficollis*

Phillips (1966) reported the first occurrence of this species from western Mexico: two females collected in the Sierra Madre del Sur of Oaxaca in 1963 and 1964. AOU (1983) described this species' range as "Resident from Guerrero, . . . south", although we can find no published record to support this statement, and Binford (1989) considered Oaxaca to be the northwestern limit of the Barred Forest-Falcon's Pacific slope range, adding "occurrence in Guerrero (A.O.U. 1983: 124) needs substantiation".

Howell heard a Barred Forest-Falcon calling 10 km by road SW of Filo de Caballo (2500 m), at dusk on 14 Dec 1985. In 1988 we heard and tape-recorded a Barred Forest-Falcon calling beside the road between Paraiso and Arroyo Grande (1100 m), on 13–14 Apr, and in 1990 we heard one calling near the road between Paraiso and San Vicente de Benitez (950 m) on 23 May.

BAT FALCON *Falco rufigularis*

Howell saw a Bat Falcon perched on a dead snag 2 km by road north of Paraiso, 22 Mar 1990, and saw a pair near Nueva Delhi, 23 Mar 1990 and 7 Oct 1993. We saw 2–3 Bat Falcons, including a pair, between Paraiso and Nueva Delhi on 21 May 1990 (850–1400 m). E. G. Strauss (pers. comm.) saw a Bat Falcon 3 km by road south of Paraiso on 17 May 1993. This distinctive small falcon is an uncommon resident on Mexico's Pacific slope, and has been recorded north to southern Sonora. NG.

SINGING QUAIL *Dactylortyx thoracicus*

We heard the distinctive, far-carrying 'song' of this species at Arroyo Grande (1350 m) on 14 Apr 1988, below Nueva Delhi (1500 m) on

16 Apr 1988, and, tape-recorded, near San Vicente de Benitez (950 m) on 23 May 1990. The last birds, at least two individuals, were in mixed coffee finca and semideciduous tropical forest, the other birds at the coffee finca-cloud forest ecotone. Navarro (1992) recorded this species only at and above 2500 m in pine-oak-cloud forest, and Warner & Harrell (1957) reported that "In Guerrero, the Singing Quail is found mostly above 6,600 feet" (2000 m). This species' altitudinal and habitat range in Guerrero is wider than previously recognized.

AMERICAN GOLDEN PLOVER *Pluvialis dominica*

Howell saw three basic-plumaged birds at the eastern end of Laguna Mitla, 22 Mar 1990, and two individuals there on 24 Mar 1990. NG.

SNOWY PLOVER *Charadrius alexandrinus*

R. G. Wilson (pers. comm.) saw one Snowy Plover at Barra Vieja, 30 km E of Acapulco, on 30 Aug 1986, and 6 birds on the beach at the E end of Laguna Mitla, 10 Jul 1988. We saw an alternate-plumaged Snowy Plover at Laguna Chautengo on 17 Apr 1988. The only other Mexican Pacific coast records we are aware of for Snowy Plover south of Nayarit are those of Binford (1989) for Oaxaca, and Hunn (1973) for Chiapas. NG.

WILSON'S PLOVER *Charadrius wilsonia*

R. G. Wilson (pers. comm.) saw single Wilson's Plovers at Barra Vieja on 30 Aug 1986, and at the east end of Laguna Mitla, 9 Aug 1991. We saw 5 Wilson's Plovers at Laguna Chautengo, 17 Apr 1988, and an alternate-plumaged male at the eastern end of Laguna Mitla, 22 Mar 1990 and 20 May 1990. These records probably represent migrants from northwestern Mexico although the species may breed locally on the coast of Guerrero. NG.

BLACK-NECKED STILT *Himantopus mexicanus*

That this species appears not to have been recorded previously from Guerrero (although listed for 20 other states by Friedmann *et al.* 1950) reflects how little historical attention has been paid to water birds in the state. Howell's notes mention it as "common" in Guerrero in Jan 1984 and Jan 1987, and present on 12 Apr 1988 between Petatlan and Atoyac. We saw 15 at Laguna Chautengo, 17 Apr 1988, and 15 near Marquelia, 18 Apr 1988. At the eastern end of Laguna Mitla we saw 50 stilts on 22 Mar 1990, 30 on 24 Mar 1990, and 6 pairs, including 2 birds on nests and a pair with two small chicks, on 20 May 1990. We also saw 100–200 stilts at Barra de Potosi, 24 May 1990. The species thus appears to be a common winter migrant and local, breeding summer resident. NG.

AMERICAN AVOCET *Recurvirostra americana*

The introductory comment for Black-necked Stilt applies equally well to this and the five following species. Our records of Avocet from Guerrero are: 2 in basic plumage at Laguna Chautengo, 17 Apr 1988, and 30–40 in alternate plumage at Barra de Potosi, 24 May 1990. NG.

PECTORAL SANDPIPER *Calidris melanotus*

Howell saw one at the east end of Laguna Mitla, 22 and 24 Mar 1990. NG.

STILT SANDPIPER *Calidris himantopus*

We noted a single Stilt Sandpiper at a roadside pond near Petatlan, 4 Jan 1987, and saw 2 at Laguna Chautengo, 17 Apr 1988. NG.

CASPIAN TERN *Sterna caspia*

Howell noted this species as "fairly common" on 18 Jan 1984 at the Guerrero side of the Rio Balsas near its mouth. We saw 8 at Laguna Chautengo, 17 Apr 1988, a first-year bird at the ponds south of Highway 200, a few km east of Juchitan, 18 Apr 1988, and a first-year at Barra de Potosi, 24 May 1990, At the east end of Laguna Mitla we noted a large aggregation of migrant Caspian Terns in spring 1990: 320 on 22 Mar, and 400 on 24 May; 90% of these birds were adults in alternate plumage, and we saw none at this site on 20 May 1990. NG.

ELEGANT TERN *Sterna elegans*

Howell noted 6 Elegant Terns on 18 Jan 1984 at the Guerrero side of the Rio Balsas near its mouth, 4 alternate-plumaged adults at the east end of Laguna Mitla, 24 Mar 1990, and one adult and 2 first-years there on 24 May 1990. NG

BLACK TERN *Childonias niger*

Noted without comment from Guerrero by Friedmann *et al.* (1950). Howell and P. Pyle observed 300+ Black Terns along the coast between the Michoacan border and Acapulco, 18 Jan 1984. They also saw numerous Black Terns at several other sites along and off the coast from Jalisco to Oaxaca in the winter of 1983/84, indicating that this species winters, at least in some years, as far north as western Mexico. Black Terns also are common spring visitors off Guerrero (Howell & Engel 1993).

BARRED PARAKEET *Bolborhynchus lineola*

Friedmann *et al.* (1950) and AOU (1983) listed this species from Guerrero, based apparently on a specimen at the Museo Nacional de Historia Natural in Mexico City. We know of no other reports of Barred Parakeet from Guerrero and consider the specimen data to be of doubtful veracity.

ORANGE-CHINNED PARAKEET *Brotogeris jugularis*

Friedmann *et al.* (1950) and AOU (1983) listed this species from Guerrero, although we know of no basis for these statements. Since this small parakeet generally is a conspicuous species, and since there are no records from Oaxaca west of the Rio Ostuta, in the Isthmus of Tehuantepec (Binford 1989), we consider the occurrence of Orange-chinned Parakeet in Guerrero to be doubtful.

PHEASANT CUCKOO *Dromococcyx phasianellus*

We heard and tape-recorded a singing Pheasant Cuckoo between Paraiso and San Vicente de Benitez (950 m), 17 Apr 1988. On 24 Mar 1990 Howell heard and taped 2–3 Pheasant Cuckoos in this same area. The Pheasant Cuckoo is resident at similar elevations in the Sierra Madre del Sur of Oaxaca where it has been recorded west to Putla, within 15 km of Guerrero (Binford 1989). NG.

EARED POORWILL *Nyctiphrynus mcleodii*

Five specimens of this little-known nightjar have been reported from Guerrero: two from the "vicinity of Chilpancingo" (Miller 1948) and three from two sites south and west of Chilpancingo (Arnold 1971). On 14 Dec 1985, Howell and R. G. Wilson heard at least 4 Eared Poorwills calling shortly after dusk, 6–10 km SW of Filo de Caballo (2500 m).

BLACK SWIFT *Cypseloides niger*

On 12 Apr 1988 we saw a lone Black Swift, apparently a migrant, flying strongly northwest, 20 km east of Petatlan. We observed up to 60–70 Black Swifts circling over the vicinity of Paraiso, 21–23 May 1990 (800–900 m); we watched and heard these birds for 15–25 minutes on each occasion, often at ranges down to 100 m, and in direct comparison with White-collared *Streptoprocne zonaris* and Vaux's *Chaetura vauxi* swifts. While the field identification of swifts is problematic, we have considerable experience with this species in North and Central America and are familiar with its vocalizations. Further, the observed dimorphism in tail shape (cleft in male Black Swifts, squared in females) and direct comparison with other species, support the identification (see Howell & Webb 1994). Navarro *et al.* (1992b) considered that Guerrero lay in "an apparent distribution gap" for Black Swift but we suspect that this species is a summer resident in the Sierra Madre del Sur, as it is in most mountainous areas of central and western Mexico (pers. obs.). NG.

CHESTNUT-COLLARED SWIFT *Cypseloides rutilus*

Howell saw 100+ Chestnut-collared Swifts between Acapulco and Agua de Obispo, 19 Jan 1984, and saw and heard six birds 10 km SW of Filo de Caballo, 3 Jun 1986. We saw 17 flying northwest, 20 km east of Petatlan, on 12 Apr 1988, 5 over San Vicente de Benitez, 24 Mar 1990, and 30 birds, including several apparent pairs chasing and calling, 15–20 km by road north of Nueva Delhi, on 22 May 1990. Sea level to 2500 m. NG.

WHITE-COLLARED SWIFT *Streptoprocne zonaris*

This swift has long been known to occur in Guerrero but nothing appears to be written on its abundance. White-collared Swifts are fairly common over the humid coastal-facing slopes of the Sierra Madre del Sur, and at times range down to near sea level (R. G. Wilson pers. comm.). Specific records are: between Atoyac and Paraiso (850–1100 m), up to 30 per day, 12–17 Apr 1988, 150+ on 22 Mar 1990, 30+ on 24 Mar 1990, up to 45 per day, 21–23 May 1990.

WHITE-NAPED SWIFT *Streptoprocne semicollaris*

In southwest Mexico this swift is characteristic of arid interior regions (pers. obs.), although small numbers range to the coastal slopes of the Sierra Madre del Sur where they may occur in the same flocks with White-collared Swifts. We saw 4–5 White-naped Swifts over Arroyo Grande (1350 m), 13 Apr 1988, 5–6 there on 15 Apr 1988, 4 between Paraiso and San Vicente de Benitez (1000 m), 24 Mar 1990, and one near San Vicente, 8 Oct 1993.

GREAT SWALLOW-TAILED SWIFT *Panyptila sanctihieronymi*

This spectacular swift was first found in Mexico as recently as 1944, in Chiapas (Alvarez del Toro 1952), with subsequent reports from Michoacan (Selander 1955), Guerrero (Arnold & Maxwell 1970), and Oaxaca (Binford 1989). Howell (ms.) summarized records from northwest Mexico. Specific records remain few and hence we report 2 birds seen low over the town of Zumpango del Rio, the morning of 22 Mar 1990.

VIOLET SABREWING *Campylopterus hemileucurus*

Binford (1989) questioned reports of a disjunct population of this hummingbird in Guerrero. Navarro (1986, 1992) reaffirmed the occurrence of Violet Sabrewings in Guerrero: he collected several specimens and considered the species a common resident in cloud forest at 1200–1800 m elevation. We noted up to five Violet Sabrewings per day in Apr 1988 and May 1990, but saw none in Mar 1990. Most were above 1200 m in cloud forest and adjacent disturbed habitat, but we also noted one male at 950 m in semideciduous forest near San Vicente de Benitez on 23 May 1990.

BROAD-BILLED HUMMINGBIRD *Cynanthus latirostris*

Two distinct forms of Broad-billed Hummingbird, the males of which can be separated in the field, occur in Guerrero: typical Broad-billed Hummingbirds (larger, males with green crowns, blue throats and green chests, and white undertail coverts) and Doubleday's Hummingbirds (smaller, males with blue crowns, blue throats and chests, and dark undertail coverts). The two forms sometimes are considered as separate species (AOU 1983). Typical Broad-billeds have been reported only from interior northern Guerrero, while Doubleday's occurs in the Pacific coastal lowlands from Guerrero to western Oaxaca (Friedmann *et al.* 1950, Binford 1989). On 11 Apr 1988 we found a male (and apparently 3 female) typical Broad-billed in coastal west Guerrero along Highway 200, 10 km east of Petacalco. We found two male (and apparently two female) Doubleday's 45 km farther east along Highway 200, i.e., about 15 km west of Zihuatanejo. Unfortunately, a military exercise being conducted between these points prevented field work to determine if the two forms were sympatric. Future studies should concentrate on this area.

VIOLET-CROWNED HUMMINGBIRD *Amazilia violiceps*

Like typical Broad-billed Hummingbirds, this species has been reported in Guerrero only from the northern interior (Friedmann *et al.*

1950). On 24 May 1990 we observed a single Violet-crowned Hummingbird feeding at flowers in a hotel garden in Zihuatanejo. We saw none in coastal west Guerrero on 11 Apr 1988, and only the one bird noted above 23–24 May 1990. Thus the species may be only a rare visitor to coastal Guerrero.

CALLIOPE HUMMINGBIRD *Archilochus [=Stellula] calliope*

We saw 2–3 female Calliope Hummingbirds daily at Arroyo Grande, 13-15 Apr 1988. These birds were identified by their very small size (in comparison with species such as Bumblebee Hummingbird *Selasphorus* [=*Atthis*] *heloisa*), faint dusky flecking on their throats, a pale vinaceous wash on their flanks, slight rufous at the bases of the outer rectrices, and, importantly, wingtips projecting beyond the short tail at rest. These features are diagnostic of the female Calliope Hummingbird (Howell & Webb 1994). There appear to be only two previous records from Guerrero, a female taken in August, and a male in October (Griscom 1934).

BARRED WOODCREEPER *Dendrocolaptes certhia*

This species appears to be an uncommon resident of forests at 900–1500 m elevation on the Pacific slope of the Sierra Madre del Sur in Guerrero; we saw and tape-recorded at least one at Arroyo Grande, 15 Apr 1988, saw and heard one 5 km by road north of Nueva Delhi, 23 Mar 1990, and heard one near San Vicente de Benitez, 23 May 1990. The Barred Woodcreepers in Guerrero look quite distinct from those in eastern Mexico, although sounding similar: the bill is mostly flesh-coloured, and the throat and chest have more contrasting pale scalloping, characters of the subspecies *sheffleri*, considered endemic to the Sierra Madre del Sur of Oaxaca (Binford 1965, 1989). NG.

STREAK-HEADED WOODCREEPER *Lepidocolaptes souleyetii*

Miller *et al.* (1957) reported this species as known from Guerrero by only three specimens, and Navarro (1992) considered it "rare" (see under Thicket Tinamou) and found it only at one site, in the cloud forest-semideciduous forest ecotone at 1200 m. We noted one at Arroyo Grande, 13 Apr 1988, one between Paraiso and Nueva Delhi, 22 Mar 1990, 4 between Paraiso and San Vicente de Benitez, 24 Mar 1990, and 1–2 near San Vicente, 21 May 1990. The species appears to be fairly common in Guerrero (900–1350 m) where, as in adjacent Oaxaca (Binford 1989), it is typical of semideciduous forest.

EYE-RINGED FLATBILL *Rhynchocyclus brevirostris*

This species was first reported from Guerrero by Navarro (1986, 1992) who considered it "rare". We saw two single birds at Arroyo Grande, 14 Apr 1988, and one bird, plus a nest at a different site, between Paraiso and Nueva Delhi, on 22 May 1990, suggesting that this easily overlooked flycatcher may be fairly common in Guerrero (1200–1500 m).

WHITE-THROATED JAY *Cyanolyca mirabilis*

This striking jay often is considered rare, e.g. by Peterson & Chalif (1973), and by Navarro (1992) who reported it from four sites (seemingly contradicting his definition of rare as "seen only once or twice in the entire study") between 1800 and 2500 m. At a site 10 km by road SW of Filo de Caballo (2500 m), Howell and R. G. Wilson failed to find White-throated Jays during a full day, 14 Dec 1985; on 3 Jun 1986, however, they easily found 4-6 White-throated Jays, travelling with mixed-species flocks that included 5–6 Emerald Toucanets *Aulacorhynchus prasinus* and 10–15 Unicolored Jays *Aphelocoma unicolor*, two other species notably absent in December; this suggests some local and seasonal movement by all three species. We also saw 2 pairs of White-throated Jays 12–15 km by road north of Nueva Delhi (1900–2000 m), 16 Apr 1988.

NASHVILLE WARBLER *Vermivora ruficapilla*

This species winters commonly in Guerrero. However, a single Nashville Warbler 5 km by road north of Nueva Delhi on 22 May 1990 was notably late in the season to be still in southern Mexico (e.g., the latest date for Oaxaca is 8 May [Binford 1989] and for Mexico City, 6 May [Wilson & Ceballos-L. 1986]). The bird's very dull plumage combined with the date suggests it may have been a first-year female.

COLIMA WARBLER *Vermivora crissalis*

Howell observed a single Colima Warbler 10 km by road SW of Filo de Caballo, 14 Dec 1985. The only other records we known of from Guerrero are two (20 Sep and 17 Apr) listed by Miller *et al.* (1957).

TROPICAL PARULA *Parula pitiayumi*

We saw a Tropical Parula in deciduous thorn scrub at the edge of mangroves near Petacalco, 11 Apr 1988, and heard 2–3 singing between Paraiso and San Vicente de Benitez (950 m) on 21 May 1990. The only other record of this species from Guerrero is that of Dixon & Davis (1958) who collected a breeding female at Acahuizotla, on the interior slope of the Sierra Madre del Sur, in June 1953.

RED-LEGGED HONEYCREEPER *Cyanerpes cyaneus*

The Red-legged Honeycreeper appears to be a breeding resident (or summer resident?) in Guerrero (900–1400 m): we saw a male in alternate plumage at Arroyo Grande on 15 Apr 1988, 6 birds (including an alternate-plumaged male) between Paraiso and Nueva Delhi on 23 Mar 1990, 5–6 (including two males, one in full and one in partial alternate plumage) near San Vicente de Benitez, 24 Mar 1990, and 6–7 between Paraiso and San Vicente, 23 May 1990. R. G. Wilson (pers. comm.) saw a pair between San Vicente and Paraiso on 13 Jul 1988, and one bird between Paraiso and Nueva Delhi on 9 Aug 1992. The only other Pacific Slope record for this species west of the Isthmus of Tehuantepec is 3 seen (including a male with enlarged testes collected) by Binford (1989) in the Sierra Madre del Sur of Oaxaca, 10 May 1964. NG.

WHITE-WINGED TANAGER *Spermagra [=Piranga] leucoptera*

Near Arroyo Grande in 1988 we saw a male on 13 Apr, a male and two females on 14 Apr, and a pair (and another bird heard) on 15 Apr;

we heard at least one bird near Nueva Delhi on 16 Apr 1988, saw a pair between Paraiso and San Vicente de Benitez on 17 Apr 1988, and heard one bird between Paraiso and San Vicente, 23 May 1990. Howell saw a male and heard other birds calling, 8 km by road north of Paraiso, 7 Oct 1993. R. G. Wilson (pers. comm.) saw up to 4 White-winged Tanagers between San Vicente and Paraiso, 30 Apr–1 May 1989, and between Paraiso and Nueva Delhi he saw a pair on 23 Mar 1990 and one bird on 8 Aug 1992. This species, with which we are familiar from many areas in Mexico and Central America, is distinctive by virtue of its plumage and structure, e.g., smaller than Flame-coloured Tanager *Piranga bidentata* with a proportionately smaller bill; the overall bright red plumage of the male, in combination with black lores and black wings with two narrow white wingbars, is unmistakable. Vocalizations (tape-recorded) agree with the calls of this species from other parts of its range in Mexico. We know of no other Pacific slope records of this species west of the Isthmus of Tehuantepec, but it appears to be fairly common in Guerrero in forest at 900–1500 m elevation. NG.

SLATE-BLUE [BLUE] SEEDEATER *Amaurospiza concolor relicta*

Howell saw two separate females of this species in roadside bamboo 15–20 km by road north of Nueva Delhi (2000 m), on 16 Apr 1988. This little-known form is endemic to southwest Mexico and was discovered, in Guerrero, in 1932 when it was described as a new species and genus (Griscom 1934). The other Guerrero records we are aware of are five collected in July and August 1939 and May 1940 (Orr & Ray 1945), one collected by C. C. Lamb 7 miles south of Mexcala, in June 1947 (MLZ specimen), and a male collected by F. A. Pitelka 3 miles W of Omiltemi (2450 m) in Apr 1950 (MVZ specimen).

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The number of subspecies of birds

by Ernst Mayr & Jane Gerloff

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We now have a rather accurate estimate of the number of species of birds (9700). What uncertainty still exists is caused less by species still to be discovered than by differences of opinion on the status of geographically rather isolated forms; it is sometimes quite arbitrary whether to call them subspecies or allospecies. The recent raising in rank of many such forms, considered subspecies 20 or 30 years ago, to the rank of allospecies is the major reason for the rise of the number of species of birds from the earlier censuses of about 8600 to the latest count of 9672 in Sibley & Monroe (1990).

By contrast, no one in recent years has ventured to make a census or even merely a guess as to the number of avian subspecies. This is why Ernst Mayr, assisted by Jane Gerloff, decided to undertake such a census. This census is simply based on the figures contained in the 15 volumes of Peters' *Check-list of Birds of the World* (1934–1986). All such a census can achieve is to get the approximate order of magnitude of this figure.

There are five sources of inaccuracy for these figures.

1. Subspecies belonging to families treated in volumes 2–15 of the Peters' *Check-list* but described after the publication (1934, etc.) of the relevant volume are not included. For volume 1 the date of 1979, when the revised edition was published, is the cut-off date.

2 Invalid subspecies. No attempt was made to check the validity of any of the listed subspecies. There is little doubt that many forms described at the height of the subspecies-splitting period from the 1920s to the 1950s have been or will be synonymized in subsequent revisions.

3 Many particularly pronounced and highly isolated forms that were listed as subspecies in the volumes of Peters' *Check-list*, are now ranked as allospecies. Others surely will also be raised in rank resulting in a reduction of the number of subspecies and a corresponding increase in the number of allospecies (without affecting the total number of described forms). This great increase in the number of allospecies is the cause for the much larger number of species recorded by Sibley & Monroe than in Peters' *Check-list*.

4 Family revisions, undertaken since the completion of Peters' *Check-list* particularly by Sibley, have resulted in the shift of certain genera to other families. Since many of these shifts are controversial, none were here followed. They are of no relevance to the overall figures.

5. Counting errors.

	Classification Family	A Gen	B Species MT	C Species PT	D Total	E Ssp PT	F Total B+E	Ratios G Ssp/sp E/D	H Ssp/PT E/C
1	Struthionidae	1	0	1	1	5	5	5.00	5.00
2	Rheidae	2	0	2	2	8	8	4.00	4.00
3	Casuariidae	1	3	0	3	0	3	1.00	0.00
4	Dromaiidae	1	1	1	2	2	3	1.50	2.00
5	Apterygidae	1	2	1	3	3	5	1.67	3.00
6	Tinamidae	9	21	25	46	128	149	3.24	5.12
7	Diomedeidae	2	8	5	13	11	19	1.46	2.20
8	Procellariidae	12	39	21	60	67	106	1.77	3.19
9	Hydrobatidae	8	13	8	21	24	37	1.76	3.00
10	Pelecanoididae	1	3	1	4	6	9	2.25	6.00
11	Spheniscidae	6	11	5	16	15	26	1.63	3.00
12	Gaviidae	1	3	1	4	3	6	1.50	3.00
13	Podicipedidae	6	9	11	20	41	50	2.50	3.73
14	Phaethontidae	1	0	3	3	12	12	4.00	4.00
15	Fregatidae	1	3	2	5	8	11	2.20	4.00
16	Phalacrocoracidae	2	16	15	31	45	61	1.97	3.00
17	Sulidae	1	5	4	9	13	18	2.00	3.25
18	Pelecanidae	1	4	2	6	8	12	2.00	4.00
19	Ardeidae	15	37	25	62	103	140	2.26	4.12
20	Scopidae	1	0	1	1	2	2	2.00	2.00
21	Ciconiidae	6	13	4	17	10	23	1.35	2.50
22	Balaenicipitidae	1	1	0	1	0	1	1.00	0.00
23	Threskiornithidae	13	19	9	28	30	49	1.75	3.33
24	Phoenicopteridae	3	4	1	5	2	6	1.20	2.00
25	Cathartidae	5	5	2	7	8	13	1.86	4.00
26	Accipitridae	60	116	102	218	434	550	2.52	4.25
27	Sagittariidae	1	1	0	1	0	1	1.00	0.00
28	Falconidae	10	32	28	60	132	164	2.73	4.71
29	Anatidae	43	106	44	150	140	246	1.64	3.18
30	Anhimidae	2	3	0	3	0	3	1.00	0.00
31	Megapodiidae	7	9	9	18	31	40	2.22	3.44
32	Cracidae	11	26	19	45	64	90	2.00	3.37
33	Tetraonidae	11	5	14	19	97	102	5.37	6.93
34	Phasianidae	57	88	97	185	468	556	3.01	4.82
35	Numididae	5	4	3	7	31	35	5.00	10.33
36	Meleagrididae	2	1	1	2	5	6	3.00	5.00
37	Opisthocomidae	1	1	0	1	0	1	1.00	0.00
38	Mesoenatidae	2	3	0	3	0	3	1.00	0.00
39	Turnicidae	2	6	8	14	45	51	3.64	5.63
40	Pedionomidae	1	1	0	1	0	1	1.00	0.00
41	Gruidae	4	9	5	14	14	23	1.64	2.80
42	Aramidae	1	0	1	1	5	5	5.00	5.00
43	Psophiidae	1	0	3	3	6	6	2.00	2.00
44	Rallidae	52	82	56	138	251	333	2.41	4.48
45	Heliornithidae	3	2	1	3	4	6	2.00	4.00
46	Rhynochetidae	1	1	0	1	0	1	1.00	0.00
47	Eurypygidae	1	0	1	1	3	3	3.00	3.00
48	Cariamidae	2	2	0	2	0	2	1.00	0.00
49	Otidae	11	11	13	24	37	48	2.00	2.85
50	Jacanidae	6	5	2	7	12	17	2.43	6.00
51	Rostratulidae	2	1	1	2	2	3	1.50	2.00
52	Haematopodidae	1	2	2	4	19	21	5.25	9.50
53	Charadriidae	33	42	19	61	60	102	1.67	3.16
54	Scolopacidae	29	61	22	83	59	120	1.45	2.68
55	Recurvirostridae	4	6	1	7	6	12	1.71	6.00
56	Phalaropodidae	3	3	0	3	0	3	1.00	0.00
57	Dromadidae	1	1	0	1	0	1	1.00	0.00
58	Burhinidae	3	3	6	9	23	26	2.89	3.83
59	Glareolidae	6	7	10	17	37	44	2.59	3.70
60	Thinocoridae	2	0	4	4	12	12	3.00	3.00

	Classification Family	A Gen	B Species MT	C Species PT	D Total	E Ssp PT	F Total B+E	Ratios G Ssp/sp E/D	H Ssp/PT E/C
61	Chionididae	1	1	1	2	4	5	2.50	4.00
62	Stercorariidae	2	3	1	4	7	10	2.50	7.00
63	Laridae	17	54	31	85	131	185	2.18	4.23
64	Rynchopidae	1	2	1	3	4	6	2.00	4.00
65	Alcidae	13	16	7	23	21	37	1.61	3.00
66	Pteroclididae	2	4	12	16	41	45	2.81	3.42
67	Raphidae-[extinct]	1	2	0	2	0	2	1.00	0.00
68	Columbidae	59	136	171	307	705	841	2.74	4.12
69	Psittacidae	81	164	171	335	614	778	2.32	3.59
70	Musophagidae	6	6	14	20	37	43	2.15	2.64
71	Cuculidae	38	61	68	129	296	357	2.77	4.35
72	Tytonidae	2	4	6	10	56	60	6.00	9.33
73	Strigidae	27	52	81	133	482	534	4.02	5.95
74	Steatornithidae	1	1	0	1	0	1	1.00	0.00
75	Podargidae	2	6	6	12	23	29	2.42	3.83
76	Nyctibiidae	1	2	3	5	12	14	2.80	4.00
77	Aegothelidae	1	2	5	7	15	17	2.43	3.00
78	Caprimulgidae	19	22	47	69	182	204	2.96	3.87
79	Apodidae	16	34	40	74	185	219	2.96	4.63
80	Hemiprocnidae	1	0	3	3	15	15	5.00	5.00
81	Trochilidae	123	179	152	331	509	688	2.08	3.35
82	Coliidae	1	2	4	6	27	29	4.83	6.75
83	Trogonidae	8	8	26	34	95	103	3.03	3.65
84	Alcedinidae	14	22	67	89	315	337	3.79	4.70
85	Todidae	1	5	0	5	0	5	1.00	0.00
86	Momotidae	6	2	6	8	43	45	5.63	7.17
87	Meropidae	7	12	12	24	38	50	2.08	3.17
88	Leptosomatidae	1	0	1	1	3	3	3.00	3.00
89	Coraciidae	5	9	7	16	28	37	2.31	4.00
90	Upupidae	1	0	1	1	9	9	9.00	9.00
91	Phoeniculidae	2	0	6	6	27	27	4.50	4.50
92	Bucerotidae	12	17	29	46	87	104	2.26	3.00
93	Galbulidae	5	8	8	16	30	38	2.38	3.75
94	Bucconidae	10	13	20	33	63	76	2.30	3.15
95	Capitonidae	13	22	56	78	233	255	3.27	4.16
96	Indicatoridae	4	6	7	13	30	36	2.77	4.29
97	Ramphastidae	5	23	18	41	64	87	2.12	3.56
98	Picidae	38	67	147	214	788	855	4.00	5.36
99	Eurylaimidae	8	3	11	14	56	59	4.21	5.09
100	Dendrocolaptidae	13	9	39	48	251	260	5.42	6.44
101	Furnariidae	58	109	109	218	441	550	2.52	4.05
102	Formicariidae	53	90	134	224	594	684	3.05	4.43
103	Conopophagidae	2	5	6	11	20	25	2.27	3.33
104	Rhinocryptidae	12	13	14	27	50	63	2.33	3.57
105	Tyrannidae	89	173	219	392	936	1109	2.83	4.27
106	Pipridae	17	27	24	51	122	149	2.92	5.08
107	Cotingidae	25	44	17	61	49	93	1.52	2.88
108	Oxyruncidae	1	0	1	1	7	7	7.00	7.00
109	Phytotomidae	1	2	1	3	2	4	1.33	2.00
110	Pittidae	1	10	16	26	90	100	3.85	5.63
111	Philepittidae	2	4	0	4	0	4	1.00	0.00
112	Acanthisittidae	2	2	2	4	5	7	1.75	2.50
113	Menuridae	1	1	1	2	2	3	1.50	2.00
114	Atrichornithidae	1	1	1	2	2	3	1.50	2.00
115	Alaudidae	15	28	48	76	354	382	5.03	7.38
116	Hirundinidae	20	35	44	79	172	207	2.62	3.91
117	Motacillidae	5	25	29	54	159	184	3.41	5.48
118	Campephagidae	9	20	50	70	298	318	4.54	5.96
119	Pycnonotidae	15	43	77	120	353	396	3.30	4.58
120	Irenidae	3	3	11	14	54	57	4.07	4.91

	Classification Family	A Gen	B Species MT	C Species PT	D Total	E Ssp PT	F Total B+E	Ratios G Ssp/sp E/D	Ratios H Ssp/PT E/C
121	Laniidae	12	26	48	74	231	257	3.47	4.81
122	Vangidae	8	7	5	12	10	17	1.42	2.00
123	Bombycillidae	5	5	3	8	9	14	1.75	3.00
124	Dulidae	1	1	0	1	0	1	1.00	0.00
125	Cinclidae	1	0	4	4	23	23	5.75	5.75
126	Troglodytidae	14	12	47	59	345	357	6.05	7.34
127	Mimidae	13	12	19	31	73	85	2.74	3.84
128	Prunellidae	1	4	8	12	30	34	2.83	3.75
129	Turdidae	49	119	188	307	880	999	3.25	4.68
130	Timaliidae	65	94	203	297	960	1002	3.37	4.73
131	Sylviidae	60	124	234	358	1105	1229	3.43	4.72
132	Muscicapidae	9	41	66	107	271	312	2.92	4.11
133	Platysteiridae	4	15	15	30	44	59	1.97	2.93
134	Maluridae	4	9	16	25	56	65	2.60	3.50
135	Acanthizidae	17	30	42	72	177	207	2.88	4.21
136	Monarchidae	20	50	78	128	403	453	3.54	5.17
137	Eopsaltriidae	11	13	26	39	107	120	3.08	4.12
138	Pachycephalidae	10	11	35	46	259	270	5.87	7.40
139	Aegithalidae	3	3	5	8	40	43	5.38	8.00
140	Remizidae	4	4	6	10	24	28	2.80	4.00
141	Paridae	4	12	35	47	218	230	4.89	6.23
142	Sittidae	4	7	18	25	88	95	3.80	4.89
143	Certhiidae	2	2	4	6	36	38	6.33	9.00
144	Rhabdornithidae	1	0	2	2	2	8	4.00	1.00
145	Climacteridae	1	2	4	6	13	15	2.50	3.25
146	Dicaeidae	7	18	40	58	167	185	3.19	4.18
147	Nectariniidae	5	41	75	116	352	393	3.39	4.69
148	Zosteropidae	11	44	38	82	197	241	2.94	5.18
149	Meliphagidae	39	77	95	172	380	457	2.66	4.00
150	Emberizidae	133	236	316	552	1496	1732	3.14	4.73
151	Parulidae	27	64	59	123	309	373	3.03	5.24
152	Drepanididae	12	14	7	21	25	39	1.86	3.57
153	Vireonidae	4	18	25	43	148	166	3.86	5.92
154	Icteridae	25	42	49	91	214	256	2.81	4.37
155	Fringillidae	20	48	74	122	357	405	3.32	4.82
156	Estrildidae	28	51	75	126	291	342	2.71	3.88
157	Ploceidae	19	67	76	143	291	358	2.50	3.83
158	Sturnidae	26	60	51	111	176	236	2.13	3.45
159	Oriolidae	2	10	18	28	73	83	2.96	4.06
160	Dicruridae	2	8	12	20	90	98	4.90	7.50
161	Callaeidae	3	1	2	3	4	5	1.67	2.00
162	Grallinidae	3	4	0	4	0	4	1.00	0.00
163	Artamidae	1	6	4	10	19	25	2.50	4.75
164	Cracticidae	3	2	8	10	34	36	3.60	4.25
165	Ptilonorhynchidae	8	7	10	17	33	40	2.35	3.30
166	Paradisaeidae	20	13	27	40	98	111	2.78	3.63
167	Corvidae	26	55	48	103	298	353	3.43	6.21
	Totals	2129	3963	4931	8894	22,243	26,206	2.50	4.51

Contents of the Columns
A=Genera
B=Monotypic Species
C=Polytypic Species
D=Total number of Species in the family (B+C)
E=Number of subspecies in the polytypic species (nominate subspecies included)
F=Total number of forms (B+E)
G=Average number of Subspecies per Species (E/D)
H=Average number of Subspecies per Polytypic Species (E/C)

Totals

In the 167 families of birds recognized in Peters' *Check-list*, 8894 species are listed. Of these, 3963 are monotypic (i.e., without subspecies), while 4931 are considered polytypic. The total number of listed subspecies (including the nominate one) in these polytypic species is 22,243; not including the nominate subspecies in this total reduces the number of subspecies to 17,289. The total number of listed named forms, i.e. all subspecies and monotypic species, is 26,206. This grand total is apt to be reasonably stable since is it not affected by the shift of rank of a subspecies to an allospecies. Also, the sinking of subspecies now considered invalid but recognized in Peters' *Check-list* and the subsequent recognition of new subspecies (not included in Peters' *Check-list*) will balance each other to some extent. However, more valid subspecies were presumably published in the nearly sixty years since the publication of vol. 2 (1934), than invalid ones are included that are to be synonymized. The real total of valid named forms is therefore presumably somewhere between 27,000 and 28,000.

We have tried to arrive at some generalizations on subspeciation. Oceanic bird species usually have fewer subspecies than land birds. Non-Passeres on average have fewer subspecies (usually less than three) than Passeres (usually more than three). Families with few species vary naturally the most, ranging from containing only monotypic species, like the Todidae, to having only a single but polytypic species with 9 subspecies (Upupidae). Two factors seem to be primarily responsible for the number of subspecies: the stability of the phenotype and the dispersal-colonization propensity of the group, in other words, a genetic and an ecological factor. One must undertake a species by species analysis if one wants to get beyond these very modest generalizations.

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A new, puzzling, American route of the Arctic Tern *Sterna paradisaea*, and its implications

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The most famous of migrations are surely those of the Arctic Tern, *Sterna paradisaea* Pontoppidan, from the Arctic to the Antarctic. It was once thought they had been slightly exaggerated (Murphy 1936); but in fact some or all of them are even longer than the necessary distance involved. In the north, recaptures of ringed birds confirmed that, in autumn, the eastern American populations fly east across the Atlantic before turning south (Austin 1928); and quite likely some of these birds re-cross it in the southern hemisphere! Similarly, Siberian populations cross an ocean to the east before turning south; this tern "is not found in southern Asia and in the Indian and western Pacific Oceans" (Alexander 1928).

Arctic Terns are (or were) similarly absent, normally, from vast areas in and around the Caribbean Sea (and northward, as noted by American Ornithologists' Union (A.O.U. 1957)). And though Alerstam (1990) still shows, speculatively, both spring and autumn migrations as being near the west coasts of México and Central America, these terns were still unrecorded from México (Friedmann *et al.* 1950), Belize (Russell 1964), Guatemala (Land 1970), Honduras (Monroe 1968), El Salvador (Dickey & van Rossem 1938; Thurber *et al.* 1987), Nicaragua, and Costa Rica (Slud 1964, Stiles & Skutch 1989). The record nearest Panamá was of one taken *c.* 200 km off the Pacific coast of Colombia, 4 October 1924 (Wetmore 1965: 453), still the only Colombian record (Hilty & Brown 1986). Nor is it reported elsewhere in South America north of southern Ecuador (Meyer de Schauensee 1966). The only Antillean record is for Cuba, 20 June 1950 (Garrido & García 1975)—a strange date for migration, but approached by some of the few recent specimen records in non-breeding parts of the eastern United States. (Bermuda records are for May and early June—Wingate 1973.)

By 1931 A.O.U. (following Austin 1928) had already given the southern limit of migrant Arctic Terns, in eastern North America, as Long Island, southern New York. Even here they are merely casual or accidental (Reilly & Parkes 1959, Bull 1964). On their absence in the eastern United States, see numerous local and state lists, some cited by Lee & Cardiff (1993). See also the maps in various elementary ornithology texts, starting with Wing (1956), and also in Storr (1958).

Inexplicably, the present official A.O.U. Check-list (1983), giving no references, reversed all this. Despite the all-but-complete absence of records anywhere in the region, it supposedly migrated "along the Atlantic coast from New England to Florida (and west along the Gulf coast to Texas)", Europe and Africa were omitted!

Yet even in New England it is virtually unknown away from breeding areas (Maine, Massachusetts). There was, in fact, no record whatever for New Hampshire or Rhode Island. In Connecticut, though breeding in the past is possible, there are still no specimens and less than five accepted sight reports (F. C. Sibley *in litt.*).

Curiously, a very different tern ecologically, the tropical Sooty Tern *Sterna fuscata*, crosses the Atlantic similarly, at least in part: the young of at least one United States colony (Robertson 1969; map) spend their first two winters (or more) in West Africa. This and other trans-Atlantic migrations, as of Brant *Branta bernicla* (Dennis 1990) and Black-legged Kittiwake *Rissa tridactyla* (Godfrey 1966), were also omitted by A.O.U. (1983).

Identification

Other similar northern hemisphere *Sterna* are readily told from *paradisaea* by their longer tarsi. But field identification is difficult, even with the other terns present for direct comparison; see for example Cardiff & Dittmann (1991), Wendehorst (1930). Other in-hand differences do exist (Laybourne, in Burleigh 1973; Weber 1981, Conry & Webb 1982), but wear, staining, moult, age (once full-grown), sex, breeding cycles, lighting, postures, etc., do not affect the short tarsus. This is constant, not seasonally variable. So we have relied on it.

Despite such claims as that field identification of juvenile terns "is moderately easy in reasonable conditions" (Grant & Scott 1969), many terns have been misidentified even in museums. Thus Clapp *et al.* (1983) found "so few of the specimens we examined proved to be correctly identified . . . some species are so difficult to distinguish that nothing but a scientific specimen is entirely satisfactory for re-evaluation of an earlier record."

Even where Arctic Terns' passage, at times, is substantiated, caution is needed. Thus, off southern California, most of the few spring adults pass in mid-May to early June. "This late passage is in opposition to published reports of large concentrations close to the northern California coast in late April and early May (which we suspect to be in error)." In southern California "they are only rarely observed from shore, and we suspect that many sightings from shore are erroneous" (Garrett & Dunn 1981: 193).

Elsewhere reports of Arctic Terns, often identified by single characters such as bill colour, are questionable; see Alexander (1952), Goethe (1935), Steinbacher (1935) and Cardiff & Dittmann (1991), and various reports of hybrid *Sterna*. All pale, moderately small terns ever taken and preserved in the immense interior of North America—south of Northwest Territories and vicinity, east of the Rocky Mountain states, and west of southeastern Ontario, western New York, the Atlantic states and recently Louisiana—proved to be *forsteri* or *hirundo*. We particularly doubt a recent July report from Michigan (Payne 1983).

Arctic Terns in México

Lists and guides of Mexican birds commonly omit the Arctic Tern. But Dickerman & Phillips (1976) pointed out that it must surely occur regularly. In adjacent California it is a "common to very common fall migrant and uncommon spring migrant on the open ocean. . . . strictly pelagic . . . rarely occurring within 8 km of shore. . . . has never been satisfactorily identified on shore" (Unitt 1984). Yet Baja California reports remain extremely few; all are sight reports, of at most two birds. Indeed Wilbur (1987) reported none south of Islas Los Coronados, right at the California border—overlooking the report from Isla Guadalupe (Jehl & Everett 1985).

Thus *S. paradisaea* apparently becomes increasingly pelagic south of California, presumably avoiding warmer inshore waters. This was not unexpected. It migrates largely at sea; those birds that migrate (in small part) overland are avoiding long, round-about journeys or unfavourable territory (Godfrey 1973).

On 23 May 1954, Dwain W. Warner and Phillips saw about 50 pale terns in Bahía de Banderas not far off Puerto Vallarta, Jalisco, where none had been seen in mid-May. On 25 May, Warner saw about 200 along the beach in the southern part of town, evidently mostly immatures. A bird collected from a rock above the beach proved to our surprise to be *paradisaea*; but it was evidently sick, having a large tumour on the right side of the abdomen. Its occurrence in Pacific México seemed accidental.

Jehl (1974) found pale terns "locally common off the coast of Michoacán on 3 April" but scarce elsewhere off Pacific Middle America. These he called *S. hirundo*; but "At sea most terns did not approach the ship closely and similar species could have been overlooked at a distance. The northward migration route of the Arctic Tern (*S. paradisaea*) is unknown. I made special efforts to look for white-bodied terns well offshore, but saw none". Fishermen also told Villaseñor of numerous groups of 200 or more terns *c*. 20–25 km off Michoacán in April and May.

The nearby Michoacán beaches were then unexplored during migrations. As soon as bird remnants were collected, problems arose. A second-from-outer primary (Maruata, 30 June 1979, A.R.P.) was identified by R. C. Laybourne as *Sterna dougalli*—unknown within thousands of km. But it was worn, and better evidence seemed important.

In September 1983, Villaseñor began a study of the birds of the beaches of Maruata, Colola, and El Farito, famous as being among the main breeding grounds of the sea turtle *Chelonia agassizii*. At Maruata he collected an outer primary, and much of the wing of a different tern, 11 February and 3 March 1984. These R. C. Laybourne identified as *S. hirundo*. But the outermost primary is very similar in *hirundo* and *paradisaea*; and S. L. Olson pointed out to Phillips that the attached humerus seemed small for *hirundo*. Still, *paradisaea* seemed highly unlikely; it was not supposed to migrate anywhere near Michoacán.

Villaseñor also collected full study skins of terns resting at night on the sand. In preparing the first five (taken 16 and 17 October 1983, and 23 October 1985) for the Universidad Michoacána de San Nicolás de Hidalgo, he noted discrepancies with descriptions of the expected

TABLE 1
Individuals of *Sterna* collected on Michoacán beaches

Date	Locality	Species	Specimen(s)	Tarsi (mm)	Fat
14 Feb 1980	Boca de Apiza, southwesternmost Michoacán	*hirundo*	2♂ im., 1♀ im. 1 [ad] sex?	20.9, 22.7, — , 19.5	Mostly general
18 Feb 1980	Punta San Telmo, southwesternmost Michoacán	*hirundo*	2♂ ad., 1♀ ad.	21.3, 21.4, 20.4	Mostly general
16 Oct 1983	Maruata	*paradisaea*	1♂ ad., 1♀ im.	15.9, 15.4	No
17 Oct 1983	Maruata	*paradisaea*	1♂ ad., 1♂ im.	15.9, 16.3	No
18 Oct 1986	Maruata	*paradisaea*	1♂ im., 1♀ im., 1 [im.] sex?, part of a wing	16.4, 14.9, 17.2	No
20 Oct 1986	El Farito	*paradisaea*	1 [im.] sex?	15.0	No
23 Oct 1985	Colola	*paradisaea*	1♂ im.	16.4	No
29 Dec 1982	Maruata	*hirundo*	1♀ ad.	20.1	Scarce
30 Dec 1982	Maruata	*hirundo*	1♀ im.	20.9	No

hirundo. Phillips, visiting in December 1985, found four of five terns examined to be *paradisaea*!

Villaseñor later collected and determined other Michoacán *paradisaea* (Table 1), comparing this identified material. This is clearly the predominant tern on the beaches in October (Villaseñor 1990, 1993). Almost all the specimens are juveniles, without fat reserves, as if after a long, hard flight.

Possible routes to Michoacán

Whence do these terns reach Michoacán, undetected? As shown above, it cannot be from the east or northeast. And to arrive over the sea from the west, they would have to turn rather sharply east (or even northeast, to land) after having migrated far south. More likely their route is at least partially over land, like the James Bay birds (Godfrey 1973).

A transcontinental flight south to Michoacán would seem to present greater difficulties than would shorter overland journeys more east- or westward; and few pale terns, except *forsteri*, are seen (at surface levels) in most of interior North America. These were almost automatically called *hirundo*, even by such an expert ornithologist as Burleigh (1972 vs. 1973); identification is difficult, and (supposedly) *paradisaea* and *dougalli* did not occur. (Early reports of *paradisaea*, as breeding in Wisconsin, had been discredited by Schorger, in editing Kumlien & Hollister 1951.) By 1966 Godfrey concluded, logically, that in Canada "postbreeding movements are to the Atlantic and Pacific oceans".

But re-study of collections in the late 1960s and 1970s by A. R. Phillips, R. C. Laybourne and others produced fall records of Arctic Terns from Arizona, Idaho, and Colorado (Monson & Russell 1975, Burleigh 1973, Conry & Webb 1982). In southeastern Washington they may now be regular (Weber 1981).

Thus (1) at least some do migrate south far away from the well-publicized routes. R. W. Dickerman informs us that there is now a record as far southeast as eastern New Mexico, and (2) it seems most unlikely that almost the only pale, slender-billed tern (aside from *forsteri*) ever taken in central-western México, west and northwest of Michoacán, should be of an accidental species. Rather, careful collecting is needed.

Can long overland flights be largely made at high elevations? This, plus local ornithologists' concentration on more "interesting", localized forms of land birds, might produce the supposed absence, or scarcity, of Arctic and Common Terns in the Rocky Mountain–Great Basin Region; and in any case, these resembled the more usual *forsteri*, and no tern was endemic. Major museums, too, sent collectors for local species and subspecies, not for widespread birds more easily available elsewhere. Thus it was the *collecting* of Arctic Terns that was accidental, not necessarily their presence.

It is thus uncertain that *paradisaea* is "casual or accidental" in the inland west (A.O.U. 1983, overlooking the Arizona and inland Washington records). Rather, we need more intensive, selective collecting in western México and along two possible routes to the north:

(a) Eastern California. Here all records are of adults, 22 May and 1 to 13 June. More doubtfully on this route were the terns in eastern Washington, 21 May 1957 (Franklin County) and 3 August 1978 (on the Idaho border; not 1987, as in Stephens & Sturts 1991), recorded by Weber (1981).

The Gulf of California remains enigmatic. Collecting well offshore in season would probably rectify the present absence of records. Monson & Phillips (1981) repeated that both Arizona specimens were taken after storms in the Gulf; but were they not possibly precipitated from the western part of the inland route?

(b) East of the above regions, records (except as above) are from 4 and 8 September to 6 October—somewhat later than the main passage off California. (The report from Colorado on 9 July [Cooke 1897] is improbable.) The apparent convergence of these inland birds later on Michoacán may be due to the lack of collecting in other parts of México.

The insufficiency of reliable data

Demarcation of this inland route, and/or of one via central-western México, might be possible if numbers of terns could be marked in central northern Canada, preferably with small radio-transmitters. But this we cannot expect. Still, evidence (positive or negative) might be obtained by more intensive searching and collecting west and northwest of Michoacán, if barriers to knowledge were removed. At least scientists should be free to collect and transport remnants from beaches. If learning were untrammelled, and birders took a more serious interest in distributions and migrations, Weber's suggestion (1981: 163) that "perhaps *paradisaea* is a more frequent migrant . . .

than previously known" might prove true far beyond eastern Washington, etc.

The lessons of recent discoveries

The scanty evidence yet available points to an overland route to southwestern México. This would be different indeed (both geographically and ecologically) from all portrayals of the world's most famous bird migrations. Once more, universally accepted, oft-repeated knowledge is not necessarily complete—even on the distributions and migrations of common, conspicuous diurnal birds.

The case is hardly unique. Thus overland flights of some oceanic gulls "via the interior of North America" to southeastern California and the Gulf of California were suggested by Devillers *et al.* (1971: 25), and when attention was focused on other diurnal, usually common, American birds in collections, other surprises surfaced.

(1) In *Catharacta* skuas, the facts in the North Pacific had been almost completely reversed, and there was some confusion elsewhere (Devillers 1977). All northeast Pacific birds had been reported as some race of *C. skua*, or (A.O.U. 1931) as *C. chilensis*. All the other southern forms were restricted by Hellmayr & Conover (1948b) to the far south, wintering north no farther than Brazil.

Devillers (1977) re-identified all these western United States birds as the Antarctic *C. maccormicki*, "an uncommon but regular fall visitor to both California and Washington" with one specimen from Greenland, where a second was reported by Parmelee *et al.* (1977) (but their "Baja California" report actually refers to a ring found in the sand in northwestern Sonora [El Golfo de Santa Clara], *fide* the finder, Jack Strauss, *in litt.* to A.R.P.)

Devillers also called *C. chilensis* a species, and had dubious reports north to southern México (Oaxaca) in the Pacific. Some specimens were somewhat doubtful; and hybridization of *maccormicki* and "*C. lonnbergi*" is reported (Trivelpiece & Volkman 1980, Abstract no. 45, 98th Stated Meeting A.O.U.).

(2) Because spring migrant and juvenile Semipalmated Sandpipers *Calidris (Ereunetes) pusilla* are abundant in the eastern United States, it was generally assumed that similar sized 'peeps' in nondescript winter plumage were also *pusilla*. By 1931 A.O.U. had it wintering north to South Carolina, to which it added (1957) the coast of the Gulf of México. It was on birders' lists each winter, and was seen by the hundreds or thousands on Christmas Bird Counts. Peterson's classic Field Guide (1947) called it "The commonest of the 'peep' in the East", presumably at all seasons. (The similar Western Sandpiper *C. (E.) mauri* "is a sticker, hard to identify".)

But *pusilla*'s true winter range (Phillips 1975b) is mainly in South America, north barely to southern México and southern Florida. It is actually *mauri* that winters farther north.

(3) For the North American race of Cinnamon Teal *Anas cyanoptera septentrionalium*, A.O.U. exaggerated the winter range southward. Again, when two species are hardly distinguishable, birds are assumed

to be of the species common at another season when males, at least, are distinctive. But Nature is not so simple.

Ducks are less often preserved as specimens than waders. But we must note that Cinnamon Teal specimens are unreported between México and Colombia, except perhaps an old Panamá record without details. An old record from Costa Rica is probably an error (Slud 1964); recent sight reports (Stiles & Skutch 1989) may not be of wild *septentrionalium*, and would be casual at best. Modern Panamá records are band recoveries (a sight report by N. G. Smith; but see Smith 1991, Snell 1991). Monroe's (1968) several reports from Caribbean Honduras are quite unlikely, and one has already been questioned; see Phillips 1975c: 70–71. (This teal is unreported from Yucatán Peninsula; Paynter 1955.)

Perhaps this exaggeration was based on ringing returns; *A. cyanoptera* was not credited to Guatemala by either Griscom (1932) or Saunders (1950).

Hellmayr & Conover (1948a) gave its normal winter range as south to Michoacán and Veracruz, México; "probably sparingly ... to Colombia and perhaps Ecuador". Presumably they were influenced by F. C. Lincoln's report of one ringed in Oregon and taken in Magdalena, Colombia. Later summaries were less circumspect. A.O.U. (1957) reported it to "Nicaragua, Costa Rica, Panamá (Canal Zone), and northern Colombia (from the Cauca Valley to Santa Marta); possibly to Ecuador". Johnsgard (in Mayr & Cottrell 1979) repeated this: "to northern Colombia; casual east and south". A.O.U. (1983) even described it as wintering south to northern Ecuador.

But in parts of the western United States, where Cinnamon Teal are common, most of them migrate south early (at least where carefully studied, in Arizona; Phillips *et al.* 1964). A flight of the scarcer Blue-winged Teal *A. discors* then moves in. These nondescript basic-(winter-)plumaged teal are ringed as the common (in spring) *cyanoptera*; and the U.S.A. Bird Banding Office so reports them, wherever recaptured. No one ever critically examines or preserves the supposedly extralimital birds (Phillips 1975c: 71; still officially ignored, as above).

(4) The extinction of the once common "old northeastern Red Crossbill" *Loxia curvirostra neogaea* was overlooked due to confusion with other races that periodically invade its former range (and at times even breed there). See Phillips (1975a) and Dickerman (1986, 1987).

(5) Gulls (*Larus*) in well-studied museums and identified by authorities also prove unreliable. Devillers *et al.* (1971) re-examined 16 "Glaucous Gulls" (*L. hyperboreus*) confirmed in a special study by Johnston (1955); six proved to be misidentified, including three of the four California birds in the University of California Museum of Vertebrate Zoology. Another California gull, called *hyperboreus* by Grinnell & Miller (1944), had previously been called an Iceland Gull *L. leucopterus* (=*glaucoides*) by no less an authority than Dwight, and was indeed too small for *hyperboreus*; but it was actually neither of these forms.

Devillers *et al.* (1971) also found that Thayer's Gull *L. glaucoides* [?] *thayeri* "has only recently begun to be recognized, but winters regularly in sizeable numbers along the coast", etc.

Thus carefully studied, officially recognized scientific 'knowledge' is not immutable (and recent changes are not necessarily in the direction of accuracy, as shown by comparing older to 1983 A.O.U. Check-lists). For Nature's truths we must remain alert. The day of the collector has *not* passed, for those who value accuracy; see also Winker *et al.* (1991).

Had collecting (and museum studies) ceased by 1965, we would still think Arctic Terns accidental anywhere between California and Ecuador, or between the Pacific and New England coasts. (And all Hawaiian *S. sumatrana*, reported by outstanding ornithologists, proved to be immature *hirundo*; Clapp *et al.* 1983.) What we need, for unforeseen problems, is better collecting, with full data.

Preserving biodiversity requires, in a few cases, regular collecting and careful comparison (see *Loxia* above), to understand problems. If this seems paradoxical, remember the facts: very few small birds survive and nest successfully (even in undisturbed habitats) more than a few years at most. We cannot confer immortality (outside of a museum collection) on short-lived, doomed individuals; but facing problems with open eyes and minds, we can work to save *populations*. This should be our aim.

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The identity of the Marquesan Swiftlet *Collocalia ocista* Oberholser

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In 1906 Oberholser described the swiftlet of the Marquesas Islands as a new species, *Collocalia ocista*. The holotype, USNM 212330, is a ♀ collected from Nukuhiva Is. by C. H. Townsend on 16 September 1899. The description was based on a total of 5 specimens collected from two different groups of islands, which are more than 1000 km apart, the Marquesas Islands (1 ♂, 1 ♀, 2 unsexed) and the Society Islands (1 ♂).

The classification of swiftlets presents some of the most difficult problems in avian taxonomy (Oberholser 1906, Mayr 1937, Peters 1940, Salomonsen 1983). It is not surprising, therefore, that authors have varied opinions as to whether *ocista* should be recognised as a species. Stresemann (1925) recognised it as a subspecies of *C. francica*. Berlioz (1929), Fisher & Wetmore (1931) and Pratt (1986) agreed to accept it as a full species, while Mayr (1937), Peters (1940), Medway (1966), Holyoak (1975) and Salomonsen (1983) considered *ocista* as a subspecies of *C. leucophaea*. Holyoak & Thibault (1978), however, treated *C. ocista* and *C. leucophaea* as "closely related forms".

Oberholser (1906) pointed out that much confusion arose because of the failure to discriminate the swiftlets having the tarsus entirely naked from those in which the tarsus is more or less feathered. He further assumed that the problems would disappear if all the swiftlets with any feathering on the tarsus were placed in a separate subgeneric group. Based on this characteristic, Oberholser (1906) separated the genus *Collocalia* into two subgenera: (1) his proposed newly erected subgenus *Aerodramus*, type *Collocalia innominata* Hume, characterized by tarsus more or less feathered; and (2) subgenus *Collocalia*, type *Collocalia esculenta* (Linn.), characterized by tarsus entirely without feathers.

However, although tarsal feathering is surely an important differentiating character in swiftlets. I doubt whether the genus *Collocalia* should be separated into two subgeneric groups based solely on tarsal feathering. Oberholser (1906) seemed unaware that there are species which he listed under subgenus *Collocalia* that also have a feathered tarsus, and *vice versa*.

Based on the colour of the plumage and the ability to echolocate, Brooke (1970) separated the genus *Collocalia* Gray, 1840 into three subgenera. Two years later (Brooke 1972), on reconsideration, he gave these full generic rank, namely *Hydrochous, Aerodramus* and *Collocalia* (*cf*. Medway & Pye 1977). I agree with Dickinson (1989a, b), Sibley & Monroe (1990) and Dickinson *et al*. (1991) in putting all the swiftlets (incl. *gigas*) in the genus *Collocalia* Gray, 1840.

TABLE 1

Wing & tail lengths, and tail furcation (in mm) of swiftlets from Marquesas and Tahiti Islands

	Marquesas (*ocista*)			Tahiti (*leucophaea*)		
	n	mean	s.d.	*n*	mean	s.d.
Wing length	70	119.21	2.57	9	122.00	2.03
Tail length*	70	61.47	1.88	9	56.00	2.46
Tail furcation**	70	9.48	1.42	9	5.94	1.51

*=outer tail; **=(outer tail—inner tail) length

I have examined 106 specimens of swiftlets from Marquesas Islands (Nukuhiva Is.: 27 ♂♂, 8 ♀♀, 11 unsexed, 3 juvs.; Uahuka Is.: 9 ♂♂, 8 ♀♀, 4 unsexed; Eaiu Is.: 1 ♂, 2 ♀♀, 3 unsexed; Uapu Is.: 2 ♂♂, 1 ♀, 2 unsexed; Hivaoa Is.: 8 ♂♂, 3 ♀♀, 11 unsexed; and Tahuata Is.: 3 ♀♀) including the holotype of *ocista* from Nukuhiva Island, and 18 specimens from Society Islands (Tahiti Is.: 12 ♂♂, 4 ♀♀, 2 unsexed) including the syntypes of *leucophaea* (MCZ 75699 & USNM 14328) and the holotype of *thespesia* (USNM 212329). The skins for this study are in the collections of AMNH (New York), BMNH (Tring, UK), MCZ (Harvard), MNHN (Paris) and USNM (Washington).

The swiftlet from Tahiti has a longer wing than that of the Marquesas (*cf*. Holyoak & Thibault 1978). In contrast, the Marquesan Swiftlet has a longer tail and deeper tail furcation than that of the Tahiti Is. (Table 1). It is very difficult, however, to separate the two populations by the colour of the feathers without using a colour guide. The back feathers of the Marquesas bird are consistently dusky brown, while those of Tahiti are consistently fuscous (colour nos. 19 and 21, respectively; Smithe 1975).

The tarsus of *C. leucophaea* from Tahiti is naked, while on the basis of this character the Marquesan Swiftlet consists of two populations. The northern population on the islands of Nukuhiva (type locality of *ocista*), Uahuka and Eiau (Fig. 1) has the tarsus feathered, while the southern population on the islands of Uapu, Hivaoa, and Tahuata has the tarsus bare. I fully agree with the opinion that the swiftlet from Tahiti identified by Finsch (1877) as *Collocalia cinerea* (Gm.) [=*Collocalia cinerea* Cassin] and named by Oberholser (1906) as *Collocalia thespesia* is a junior synonym of *Macropteryx leucophaeus* (now *Collocalia leucophaea*), described by Peale (1848) from the same island.

The morphological characters summarized in Table 1 indicate that the Marquesan Swiftlet *Collocalia ocista* Oberholser, 1906 should be treated as a distinct species. I propose that the two Marquesan populations are formally separated in two subspecies (Table 2). The proposed alterations to the nomenclature of *ocista*, therefore, are as follows:

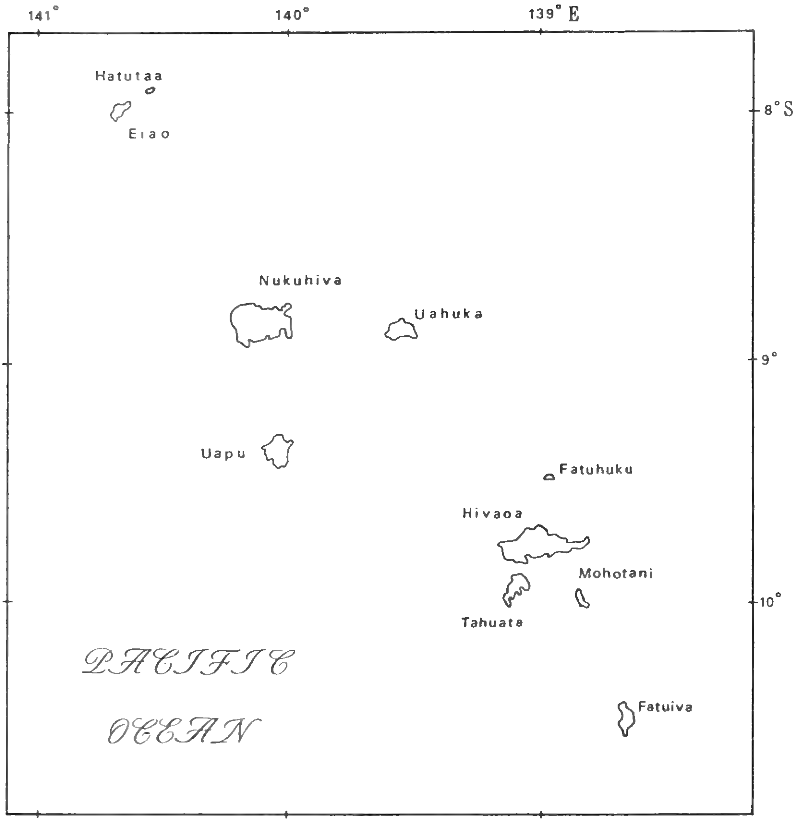

Figure 1. Map of Marquesas Islands

Collocalia ocista ocista Oberholser

Collocalia ocista Oberholser, *Proc. Acad. Nat. Sci. Philadelphia* 58, 1906, pp. 179 & 184: Nukuhiva Island, Marquesas Islands.

Holotype. USNM 212330, ad. ♀, collected from Nukuhiva Is., Marquesas Islands by Ch. H. Townsend on 16 September 1899.

Measurements of the holotype (mm). Wing (chord) 117, outer tail 64.0, tail furcation 10.0, culmen, 5.0, tarsus 10.0.

Specimens examined (incl. the holotype). AMNH—63 specimens (Nukuhiva Is.: 26 ♂♂, 7 ♀♀, 10 unsexed; Uahuka Is.: 8 ♂♂, 5 ♀♀, 1 unsexed; and Eaio Is.: 1 ♂, 2♀♀, 3 unsexed); BMNH—4 specimens (Nukuhiva Is.: 1 ♂, 3 juvs.); MNHN—1 specimen (Nukuhiva Is.: 1 unsexed); USNM—8 specimens (Nukuhiva Is.: 1 ♀, the holotype; Uahuka Is.: 1 ♂, 3 ♀♀, 3 unsexed).

Description. The colour of the dorsal feathers is almost uniform dusky brown, the rump is slightly lighter. Wings and tail are more

TABLE 2
Wing & tail lengths, and tail furcation (in mm) of *C. o. ocista* Oberholser and *C. o. gilliardi* subsp. nov.

	C. o. ocista			*C. o. gilliardi*		
	n	mean	s.d.	*n*	mean	s.d.
Wing length	48	118.43	1.99	22	120.91	2.90
Tail length*	48	61.06	1.80	22	62.36	1.77
Tail furcation**	48	9.41	1.34	22	9.63	1.61

*=outer tail; **=(outer tail—inner tail) length

blackish. The colour of ventral feathers is between drab and olive-brown (col. nos. 27 & 28, Smithe 1975). The average wing length (118.43 mm) is shorter, the tail length (61.06 mm) is longer, and the tail furcation (9.41 mm) is deeper than those of *leucophaea* (Table 1). The tarsus is feathered.

Range. Nukuhiva, Uahuka and Eiao Is. (Marquesas Islands) north of 9° South latitude (Fig. 1).

Collocalia ocista gilliardi subsp. nov.

Holotype. AMNH 190163, ad. ♂, collected from Hivaoa Island, Marquesas Islands, by E. H. Quayle & R. H. Beck on 26 January 1921.

Measurements of the holotype (mm). Wing (chord) 125.0, outer tail 62.0, tail furcation 8.0, culmen 5.0, tarsus 9.5.

Specimens examined (incl. the holotype). AMNH—30 specimens (Uapu Is.: 2 ♂♂, 1 ♀, 2 unsexed; Hivaoa Is.: 7 ♂♂, 3 ♀♀, 11 unsexed; and Tahuata Is.: 3 ♂♂); and BMNH—1 specimen (Hivaoa Is.: 1 ♂).

Description. Similar to the nominate race, but tarsus is naked; the average wing length (120.91 mm) and the average tail length (62.36) are longer, and the tail furcation (9.63 mm) is slightly deeper (Table 2).

Range. Uapu Is., Hivaoa, Is., and Tahuata Is. (Marquesas Islands) south of 9° South latitude. Probably it also occurs on Fatuiva Is. (Fig. 1).

Etymology. I take pleasure in naming this new subspecies in honour of my first teacher in ornithology, the late Dr. E. Thomas Gilliard, late Curator of the Department of Ornithology, The American Museum of Natural History.

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Cranial osteology of Tawny and Steppe Eagles *Aquila rapax* and *A. nipalensis*

by Storrs L. Olson

Received 24 November 1993

Although the Tawny Eagle *Aquila rapax* and Steppe Eagle *A. nipalensis* are now often treated as subspecies of a single species (*A. rapax*), Clark (1992) recently presented a convincing analysis of plumage, external morphology, distribution and habits, from which he concluded that these are two very distinct species, as they were regarded by most writers in the first half of this century and before.

One of the significant differences in the two species noted by Clark is the greater width of the gape in *A. nipalensis*. With this in mind, I thought it would be of interest to investigate to what degree the underlying skull structure would reflect this difference and might otherwise support Clark's conclusion. Several skeletons of *A. rapax* were immediately at hand but locating one of *A. nipalensis* proved something of a task because the world inventory of avian skeletons (Wood & Schnell 1986) includes both species under *A. rapax*. This provides a good example of the manner in which information is only lost by unsubstantiated lumping of species-level taxa.

After considerable correspondence, I was able to locate and examine a single skull and mandible of *A. nipalensis* (UMMZ 215418), from an individual taken in Turkmenistan, on the eastern shore of the Caspian Sea, which was compared with 5 individuals of *A. rapax*.

The skull in *A. nipalensis* is not only decidedly larger but also more elongate, so that the interorbital bridge is proportionately narrower than in *A. rapax* (Fig. 1). The bill is much more elongate and laterally compressed in *A. nipalensis*. Presumably in accordance with this, the maxillopalatines are larger and longer as well. The interorbital septum in *A. nipalensis* is thick and impervious, whereas in *A. rapax* (and all other specimens of *Aquila* examined) the septum is very thin and has a large oval fenestra (Fig. 2). In lateral view, the braincase in *A. nipalensis* is seen to be longer and the temporal fossa greatly enlarged relative to that of *A. rapax*, so that M. adductor mandibulae is much more extensive both anteroposteriorly and dorsally.

In dorsal view, the mandible (Fig. 1) of *A. nipalensis* is correspondingly larger and longer than in *A. rapax*. Furthermore, the rami are bowed in a very distinctive manner that must be responsible for the differences in the gape of these two species noted by Clark.

The preceding differences in cranial osteology between *A. rapax* and *A. nipalensis* fully corroborate Clark's view that these are perfectly distinct species. I know of no instance in which differences of this magnitude occur in conspecific populations of Accipitridae. In fact, the opposite is much more frequently the case—taxa that are universally acknowledged to be good species may show very little difference in cranial osteology.

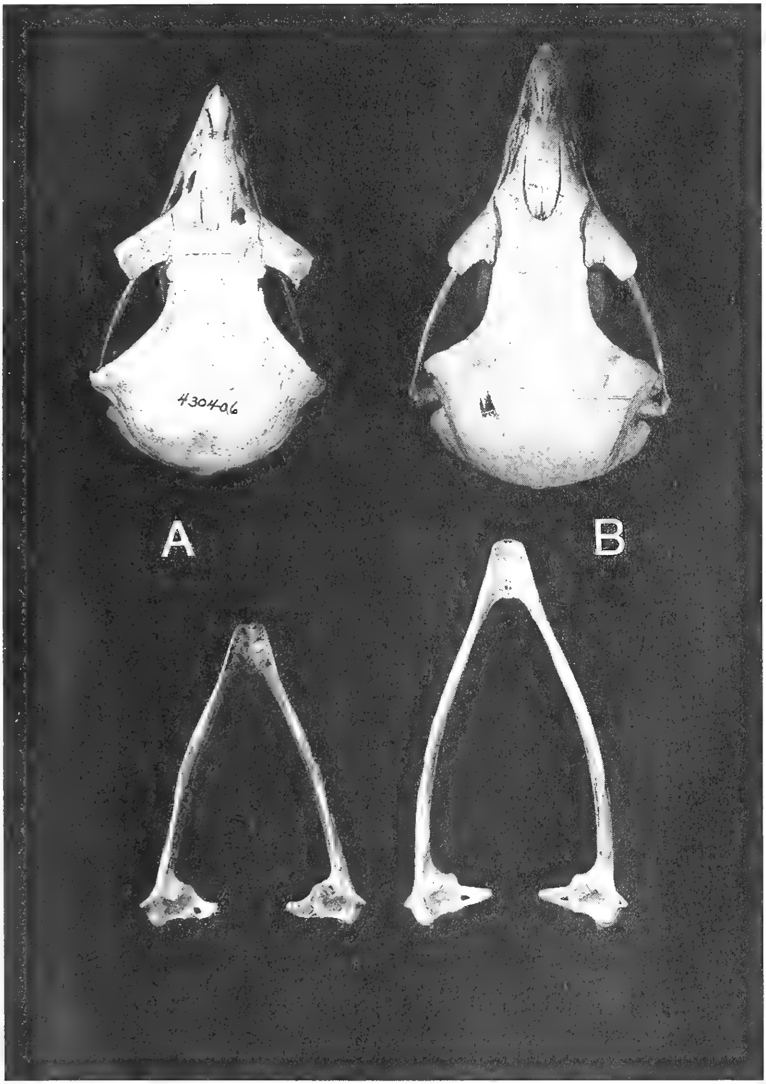

Figure 1. Dorsal view of skulls (above) and mandibles (below): A, *Aquila rapax* (USNM 430406); B, *Aquila nipalensis* (UMMZ 215418).

The morphological and behavioral differences between *A. rapax* and *A. nipalensis* were so impressive to Clark that he considered (pers. comm.) that they might not even be particularly closely related. I found one distinctive character shared by these two species, however, that seems to indicate that they are indeed sister-species, as further

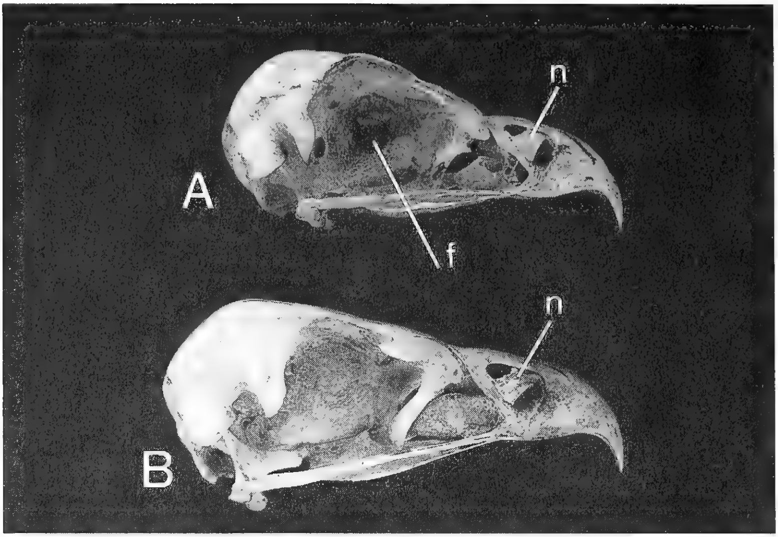

Figure 2. Right lateral view of skulls: A, *Aquila rapax* (USNM 430406); B, *Aquila nipalensis* (UMMZ 215418). Note the unique lack of a fenestra (F) in the interorbital septum of *A. nipalensis*. Among the forms of *Aquila*, the bridge of bone across the nostril (n) occurs only in these two species.

suggested by certain plumage similarities, such as the identical tail pattern in immatures. In the one specimen of *A. nipalensis* and all 5 of *A. rapax* there was a broad, solidly ossified bridge of bone across the nostril, dividing it into two smaller openings (Fig. 2). This condition was not encountered in any of the 6 other species of *Aquila* available for this study, although in 3 of 4 specimens of *A. audax* there were irregular traces of ossification at the edges of the nostrils. This bridge could well be present in a cartilaginous state in other species of *Aquila*, and perhaps in other genera as well, but it never seems to ossify except in *A. rapax* and *A. nipalensis*. Perhaps this character is not as significant, however, as the complete lack of a fenestra in the interorbital septum in *A. nipalensis*, in which respect it is unique in the genus *Aquila*. Henceforth, the Steppe Eagle, *Aquila nipalensis*, should unquestionably be given full specific rank.

Material examined. All skeletons of *Aquila* were from the collections of the National Museum of Natural History, Smithsonian Institution, except for 2 as mentioned in Acknowledgements. *A. rapax*, 5; *A. nipalensis*, 1; *A. gurneyi*, 1; *A. wahlbergi*, 1; *A. verreauxi*, 1; *A. fasciata*, 1; *A. audax*, 4; *A. chrysaetos*, 20.

Acknowledgements

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Museum of Natural History, Norman) for a skeleton of *A. rapax*; and Robert Prys-Jones for information regarding specimens in the British Museum (Tring). I am also grateful to William S. Clark for discussions and information. The photographs are by Victor E. Krantz, Smithsonian Institution.

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Report on three collections of birds from Liberia

by Robert W. Dickerman, W. Parker Cane, Michael F. Carter, Angela Chapman & C. Gregory Schmitt

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The American Museum of Natural History has recently received three collections of birds made in Liberia. M. F. Carter collected in Bong, Cape Mount and Sinoe Counties (1985–86); W. P. Cane, M. F. Carter and R. W. Dickerman collected at Greenville, Sinoe County, Juarzon [also Zuazhon on some maps], Sinoe Co. and on the Upper Dugbe River (*c.* 20 km SSE of Jaoudi) and at Jaoudi Town, Grand Gedeh County (1988); and M. F. Carter, A. Chapman, R. W. Dickerman and C. G. Schmitt collected in the Wonigizi Mountains, Lofa County (1990). Skeletons and liquid preserved (pickled) specimens formed major elements in each of these collections. Frozen and alcohol preserved tissues were collected in 1990.

Three notes have been published to date (Cane & Carter 1988, Dickerman 1989, 1993), and two (noted in text) are in preparation or are in press. We here report specimens that augment the distribution, status or nomenclature of the respective species in Liberia as presented by Urban *et al.* (1986), Colston & Curry-Lindahl (1986), Gatter (1988), Fry *et al.* (1988, 1992) and Keith *et al.* (1992). In the text, British Museum (Natural History) is abbreviated to BMNH; type locality is abbreviated to TL and "western" refers to populations with ranges west of the Dahomey forest gap. All Mount Nimba records are from Colston & Curry-Lindahl (1986) and that reference is usually not repeated. All measurements are in millimeters.

LEMON DOVE *Columba larvata* subsp.

Two males collected in the Wonigizi Mountains in March 1990 represent the third locality record for the species in Liberia. The first Liberian specimen was referred to the subspecies *plumbescens* (TL Cameroon) by Peters (1937); the Mount Nimba specimens to *simplex* (TL São Tomé island) by Colston & Curry Lindahl (1986) and to *inornata* (TL Mt. Cameroon) by Urban *et al.* (1986). The species is in need of a thorough revision.

YELLOW-THROATED CUCKOO *Chrysococcyx f. flavigularis*

Gatter (1988) listed the species for Liberia and gave the symbols for rare and rainforest, but the basis for his inclusion of the species on the Liberian checklist is uncertain. An adult female with a soft-shelled egg in the oviduct was taken 13 March 1990. This may be the first specimen record for Liberia. A partial skeleton was saved. The trinomial is used as the population east of the Dahomey forest gap is being described (Dickerman 1994).

CINNAMON SCOPS OWL *Otus i. icterorhynchus*

A single adult was taken in the Wonigizi Mountains, March 1990. It was prepared as a 'schmoo' (study skin with no skeletal elements) and a full skeleton. The species was previously taken in Liberia at Mount Nimba. The four specimens from Liberia range in colour from a sandy-rufous to cinnamon, with one of the Mount Nimba specimens nearly exactly matching the type (Ghana).

RED-CHESTED OWLET *Glaucidium t. tephronotum*

Three were taken in the Wonigizi Mountains in March 1990. The species was previously collected in Liberia only at Mount Nimba. A full skin and partial skeleton, a 'schmoo' and full skeleton and a pickled specimen were saved.

LONG-TAILED NIGHTJAR *Caprimulgus climacurus* subsp.

The pale, buffy to sandy-buff coloured nominate form is a widespread migrant throughout the region, apparently being more common coastally. Carter took a specimen on the Lofa River, Cape Mount County, 21 December 1985.

Two dark, sedentary, semi-sedentary or perhaps irregularly migrant populations occupy the more humid belt of West Africa. *C. c. leoninus* (TL Sierra Leone) is essentially dark grey and black dorsally, the brown tones are dull, the breast band is dark grey-brown; it occurs in the west, Sierra Leone to Southern Nigeria (Lagos). A specimen of *leoninus* from Robertsport, Cape Mount Co., Liberia, 25 November 1889, is in the AMNH. The subspecies was not recognised by Fry *et al.* (1988). *C. c. sclateri* (TL Cameroon) in contrast is dark, rich warm brown and black dorsally, and has a rich brown neck band. It occurs in Cameroon and adjacent Gabon. At least occasionally *sclateri* wanders west to Sierra Leone (two specimens BMNH 1914.4.14.9 and 1966.16.112) and Liberia (the male from Mount Nimba). The other two specimens reported from Mount Nimba are migrant *climacurus*.

RED-HEADED DWARF KINGFISHER *Ceyx (Ispidina) lecontei*

The first two specimens from Liberia were from Mount Nimba. The species is represented in the AMNH collections by four taken near the Upper Dugbe River in April 1988, and eleven from the Wonigizi Mountains in March 1990. A female taken 19 March had a soft-shelled egg in the oviduct. Both skeletal and pickled material were preserved.

Dickerman (1993) demonstrated that the eastern and western populations are distinct, differing in size, colour and pattern. The names *ruficeps* (TL Ghana) and *lecontei* (TL Gabon) are available for the two populations.

CHOCOLATE-BACKED KINGFISHER *Halcyon badia*

Subspecific taxa were not recognised in this species by Colston & Curry-Lindahl (1986), Fry *et al.* (1988), nor Fry *et al.* (1992). The characters assigned to *budongensis* (TL Bugoma Forest, Uganda) do not seem to hold up; however, *lopezi*, described on the basis of a single specimen from "Sipopo, Fernando Po [=Bioko]" (Alexander 1903), does seem to be valid. Amadon (1953) reported that a second specimen of *lopezi* from Bioko had a "squarish-shaped wing speculum." We also note the wing converts are blacker than those of 26 of 33 specimens from Cameroon eastwards, and that the speculum is paler and more greenish blue than in 28, and the rump is paler than in 29 of those specimens. We see no reason not to recognise the island population as distinct.

Three specimens from Liberia in the AMNH were distinct from all 33 specimens from east of the Dahomey forest gap and thus further comparisons were made in the BMNH. The western population is indeed distinct, and may be known as

Halcyon badia obscuridorsalis subsp. nov.
Dickerman and Cane

Holotype. Female, AMNH 827464, 10½ km north, 1 km east of Zigida (or Ziggida), Lofa County, Liberia, elevation 560 m, collected 10 March 1990, by Robert W. Dickerman; field number RWD 21094.

Diagnosis. Crown and upper back darker, deep Maroon (Color 31), rather than Chestnut (Color 22) of Smithe (1974–1981); tertials almost black.

Measurements of the type. Wing chord 92; tail 55; exposed culmen 40.

Etymology. The trinomial refers to the dark colour of the back.

Range. Forested regions west of the Dahomey forest gap.

Discussion. In comparisons made at the BMNH only 1 of 19 (5%) of *obscuridorsalis* is sufficiently pale and reddish dorsally to be lost in the series of eastern birds, while 2 of 55 (4%) eastern birds are dark enough to fit comfortably in the series of *obscuridorsalis*. One specimen from "Benin" [=Bendel?] Province, Nigeria, is typical of nominate *badia*, while another from Omanelu, Rivers Province, is like *badia* on the crown, but like *obscuridorsalis* on the lower back.

Specimens examined. H. b. obscuridorsalis. Sierra Leone 2; Liberia 8; Ghana 8. *H. b. badia.* Cameroon 17; Gabon 14; Zaire 20; "Congo" 2; Uganda 3.

MALACHITE KINGFISHER *Corythornis (Alcedo) cristata galerita*

The Mount Nimba report did not use a trinomial, while Fry *et al.* (1988) used *galerita* for all of Africa, except the populations of southern Angola and southwestern Zambia south to the Cape of Good Hope. Dickerman (1989) demonstrated that *galerita* should be restricted to birds occurring west to the Dahomey forest gap. That usage was followed by Fry *et al.* (1992).

COE'S HONEYGUIDE *Melignomon eisentrauti*

A female with an enlarged ovary (ova to 6 mm) was taken in the Wonigizi Mountains 16 March 1990. This is the second locality record for Liberia. Although "Yellow-footed Honeyguide" is one of the suggested names for this species, C. G. Schmitt, who prepared this specimen, noted the tarsi and toes to be dark Cinnamon (Color 123A of Smithe 1974–1981). This may indicate seasonal changes during laying periods.

LEAST HONEYGUIDE *Indicator exilis*

Two specimens taken 9 and 12 March in the Wonigizi Mountains contained enlarged ova. They represent the second record of the species in Liberia.

Contra Colston & Curry-Lindahl (1986) and Short & Horne (1988), these and the fine series from Mount Nimba are not the small, dark nominate subspecies in which the wing chord of males averages 73.5 (Short & Horne 1988) but are larger with the wing chord of males averaging 77.7 (Colston & Curry-Lindahl 1986), and they are paler. They match the type and paratype of *I. e. ansorgei* Bannerman, described from Portuguese Guinea. However, that name has been placed in *I. willcocksi* by White (1965) and Short & Horne (1988). If *willcocksi* is a valid species and not based on sub-definitive plumages of *exilis*, then the Liberian populations of *exilis* will need a new name.

SQUARE-TAILED ROUGHWING SWALLOW *Psalidoprocne n. nitens*

Three specimens taken in the Wonigizi Mountains in 1990 are the second locality record of the species for Liberia.

YELLOW-THROATED BULBUL *Criniger olivaceus*

The species was reported for the first time in Liberia from the Mount Nimba region; it was previously rare in collections. Four specimens were taken along the Upper Dugbe River in April 1988, and nine were taken in the Wonigizi Mountains in March 1990. The species is apparently widespread and will probably be found whenever mist-nets are used in rain forests in Liberia. Skeletons and pickled specimens were preserved.

GREY GROUND THRUSH *Zoothera p. princei*

This species, like the above, is probably far more common and widespread than pre-Nimba studies indicated. Seven were taken at Mount Nimba; one was taken at Jaoudi and 8 along the Dugbe River in April 1988, and one was taken in the Wonigizi Mountains in March 1990. Skeletons and pickled specimens were preserved.

PALE-BREASTED THRUSH BABBLER *Trichastoma rufipennis extrema*

First reported in Liberia from Mount Nimba, the species is apparently common and widespread in both virgin and second-growth rainforests. Additional localities are: Dugbe River (15 specimens); Jaoudi (3); and Wonigizi Mountains (39).

RUFOUS-WINGED THRUSH BABBLER *Trichastoma rufescens*

The species was described from "Liberia" without a specific locality, and before the Nimba study, when 18 were collected, it was rare in collections. Additional localities are: Jaoudi (2), Dugbe River (4) and Wonigizi Mountains (16). The species is widespread and apparently fairly common, occurring in both virgin and second-growth rainforests. Skeletons and pickled specimens were preserved.

SEDGE WARBLER *Acrocephalus schoenobaenus*

A bird netted at Greenville, 25 March 1988, is apparently the first specimen record for Liberia although Gatter (1988) considered it to be fairly common.

WOOD WARBLER *Phylloscopus sibilatrix*

A female netted 21 March 1990 in virgin forest in the Wonigizi Mountains is the second locality record for this species in Liberia. It was previously taken at Mount Nimba.

YELLOW-BELLIED WATTLE-EYE *Platysteira c. concreta*

This species was first found in Liberia at Mount Nimba and was common there. Carter took three specimens in northern Cape Mount County in January 1986 and near Juarzon, Sinoe County in April 1986. It was also common along the Dugbe River (12 specimens) and in the Wonigizi Mountains (23).

DUSKY CRESTED FLYCATCHER *Trochocercus nigromitratus*

Colston & Curry-Lindahl (1986) and Traylor (1986) both apparently followed Chapin (1953) in not recognising subspecies in the Dusky Crested Flycatcher. However, the large series now available from Liberia is consistently distinct from the even larger series available from Cameroon east to Kenya. The three names available: *nigromitratus* Reichenow 1874 (Cameroon), *kibaliensis* Alexander 1905 ("Kibali River" =Surugu or upper Uelle River, Zaire) and *intensus* Gyldenstolpe 1922 (Semliki Valley, Kiva District, Zaire) all refer to the eastern population.

First, the extent of sexual *vs* age dimorphism must be discussed. In any series of specimens some individuals have essentially unicoloured greyish venters, while in others the belly region has a moderate amount of whitish 'underfeathers' showing. Most specimens with unicoloured venters (18 of 25, 72%) were males, while 11 of 19 (58%) of whitish-bellied birds were females. The white-bellied males were probably first-year birds, while the dark-bellied females may be older birds. Thus in making comparisons, dark-bellied birds were compared with dark-bellied and light with light. There appears to be no (or exceedingly little) colour change due to museum age within series from a region. The western birds may now be known as

Trochocercus nigromitratus colstoni subsp. nov.
Dickerman

Holotype. Adult male, AMNH 827744, collected 1 km east, 12 km north Zigida (or Ziggida), Lofa County, Liberia, on 13 March 1990 by C. Gregory Schmitt; field number CGS 5240.

Diagnosis. Similar to nominate population but slightly paler and brighter blue both dorsally and ventrally, less dull, flat dark grey. In *colstoni* there is a distinct tendency dorsally to have a white-tinged collar. Although differences between individuals are subtle when two specimens are compared, the differences when series are seen side by side are dramatic.

Measurement of the type. Wing chord 60, tail 62 exposed culmen 11.

Etymology. It is a pleasure and appropriate to name this form for Mr Peter R. Colston who prepared the bulk of the report on the large collection from Mount Nimba in the BMNH, especially the comprehensive tables of biometrics. Mr. Colston confirmed my impression of the distinctness of the two populations.

Range. Specimens examined only from Liberia and southern Nigeria, but probably occupies forested regions west of the Dahomey forest gap.

Specimens examined. *T. n. colstoni*: Liberia 29; Nigeria 1. *T. n. nigromitratus*: Cameroon 30; Gabon 1; Congo 1; Zaire 9; Uganda 11; Kenya 11.

RED-FRONTED ANT-PECKER *Parmoptila rubrifrons*

The alternate English name is amusing and worth recording, it is longer than the bird: Red-fronted Flower-pecker Weaver-finch (Mackworth-Praed & Grant 1973).

Two males taken in the Wonigizi Mountains in March 1990 comprise the third specimen record of the species in Liberia. A large series was taken at Mount Nimba, and Michael F. Carter took two near Jaoudi, Grand Gedeh County, in October 1986. Gatter (1988) gave symbols indicating that it was rare to common in Liberia.

In West Africa, there are four named populations which Traylor (1968) combined under the specific name *woodhousei*. Two of these, *woodhousei* (1859) of Gabon to eastern Zaire, and *ansorgei* (1904) of Uganda, are obviously conspecific. They are essentially 'female-plumaged' and non-dimorphic (in juvenal or in definitive plumage), the adult males differing only in having a red forehead.

The other two exhibit strong dimorphism, the males (juvenile and adult) being near chestnut ventrally, while the adult females (juveniles have not been seen) are not dissimilar from *woodhousei*, but are 'scaled' rather than spotted ventrally. These two are: *rubrifrons* (1872) from Ghana, and *jamesoni* (1890) described from "Congo" and ranging from Zaire east to western Uganda. Thus the ranges of the two dimorphic populations are separated by the range of non-dimorphic *woodhousei*. To date sympatry is not known among any of the forms. Until new information becomes available, three species should be recognised.

If the dimorphic species are combined, Liberian birds cannot bear either the name *P. jamesoni rubrifrons* as in Colston & Curry-Lindahl (1986), or *P. jamesoni* as in Gatter (1988); they must take the older name *rubrifrons*. It should be noted that Chapin (1953) used *jamesoni* for the chestnut-bellied Congo birds, but he treated the three forms in that region as full species.

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Notes on birds from Africa with descriptions of three new subspecies

by Robert W. Dickerman

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While identifying specimens in three collections from Liberia, recently received by the American Museum of Natural History (AMNH) (see Dickerman *et al*. 1994), several problems became evident that affect the nomenclature of species beyond the limits of Liberia. Unless noted, all specimens examined were in the collections of the AMNH or British Museum (Natural History) (BMNH). In the text, type locality in abbreviated to TL, and "western" refers to populations with ranges west of the Dahomey forest gap. All measurements are in millimeters.

BLUE-SPOTTED WOOD DOVE *Turtur a. afer*

No subspecies were recognised by Urban *et al*. (1986) nor by Colston & Curry-Lindahl (1986). However *mearnsi* (TL Ethiopia) is definitely paler and larger than nominate *afer*. The wing chord of 9 *mearnsi* (sexes alike) measured 113–121 (mean 116.4, s.d. 2.1), while the wings of 10 West African *afer* (5 each sex) measured 101–110 (mean 106.9, s.d. 3.0). Urban *et al*. (1986) gave wing measurements for five males and five females from South Africa as: 107–112 (109) and 109–112 (110) respectively. It should be noted that an adult female from the highlands of northern Cameroon (AMNH 415096) is both dark and large (wing 117), and perhaps represents an isolated population of larger birds.

YELLOW-THROATED CUCKOO *Chrysococcyx flavigularis*

The population west of the Dahomey forest gap is extremely poorly represented in ornithological collections. Fry *et al.* (1988) wrote that there were only 7 records west of Cameroon, some undoubtedly sight records. The species was described from Ghana.

Comparisons were made among 17 specimens: 15 of the eastern population (9 adult males, 2 juvenile or 1st basic plumaged males, and 6 females); and 2 females of the western population, the only specimens available. These latter differed from the 4 eastern females and 2 female-plumaged males. The eastern (and apparently more common population) may be named as

Chrysococcyx flavigularis parkesi subsp. nov.

Holotype. Adult female, LACM 70110, collected at Mongira in the Bwamba Forest, western Uganda on 3 November 1968 by Andrew Williams. Field number B155.

Diagnosis. Female and young males similar to nominate form, but browner, less creamy-white ventrally, this especially obvious on undertail coverts. No males of nominate form seen. Plate 5 in Fry *et al.* (1988) illustrates the female plumage of *parkesi*.

Measurements of type. Wing chord 96; tail 65; exposed culmen 17.2.

Etymology. I name this cuckoo for my colleague, close friend and severest critic, Dr. Kenneth C. Parkes of Carnegie Museum of Natural History.

Range. Specimens examined only from Cameroon, Zaire and Uganda, but probably occurs in forested regions east of the Dahomey gap (see Fry *et al.* 1988: 85).

Specimens examined. *C. f. flavigularis*: Sierra Leone 1 F; Liberia 1 F. *C. f. parkesi*: Cameroon 1 ad.M, 2 imm.M, 2 F; Zaire 2 M, 1 F; Uganda 6 ad.M, 1 F.

WHITE-BELLIED KINGFISHER *Alcedo leucogaster batesi*

Fry *et al.* (1988, 1992) apparently combined the smaller birds, *batesi*, (TL Bitye, Cameroon) of the mainland with the larger sized nominate birds from Bioko (formerly Fernando Po). Chapin (1922), in describing *batesi*, found only a single mainland bird to have as long a wing chord, and none to have as deep bills as the 3 nominate specimens he had available. Remeasuring some of the same specimens, but with the added material from Bioko discussed by Amadon (1953), I found only two of 17 (12%) *batesi* had the wing chord or two of 16 (13%) had bill depth measurements as large as 8 *leucogaster*.

The first specimen of *A. leucogaster* from Tanzania is a dark-billed immature (by ovary) female, AMNH 826002, that was remade from a spirit specimen. It was taken 11 July 1987 by Kim M. Howell (field no. 4036) in Minzoro Forest Reserve west of Lake Victoria, about 50 km northwest of Bukoba. It represents the subspecies *leopoldi* and extends its range eastward into Tanzania.

Contra Fry *et al.* (1988), *leopoldi* is not paler in either its blue or its red colours than *leucogaster (sensu stricto)*, nor than *batesi*. It differs from them in lacking a rufous (or vinaceous) superciliary, and in having pale greenish-blue bars on the crown and nape in both adults and young. And, *contra* Fry *et al*. (1992), only the two young *leopoldi* (including the Tanzania specimen) of the ten dark-billed immatures seen to date have the "... mantle spangled with [pale] blue", a character they ascribed to the juvenal plumage of the species. The other eight young (2 *bowdleri*, 5 *batesi*, 1 *leucogaster*) have dark blue backs similar to those of adults. The breast band of juveniles is a somewhat paler rufous than in adults and it usually has a dusky wash.

BLUE-HEADED BEE-EATER *Merops muelleri* subsp.

Fry *et al*. (1988, 1992) stated that the sexes are alike. However, in series in the AMNH and the BMNH, males (from throughout the species' range), while similar to each other, are readily distinguished from most specimens labelled female. Males have more intense colouration, brighter cinnamon backs, deeper blue venters and deeper red throats. Males are somewhat larger than females.

Amadon (1953), in discussing the Bioko population, assumed that "previous authors" were correct in not recognising *marionis* described from "Bakaki, Fernando Po" (Alexander 1903) as distinct from the mainland populations. They were wrong. Island birds are larger, especially in wing chord. With sexes combined, the measurements for *marionis* (n=11) and *mentalis* (n=18), respectively, are: 85–92 (87.4 ± 1.6) *vs* 81–85.5 (82.9 ± 1.4) (range, mean and standard deviation).

LITTLE GREEN BULBUL *Pycnonotus virens*

Rand (1960) apparently followed Amadon (1953) who considered the population of *P. virens* on Bioko to be the same as the nominate subspecies (TL Gabon) on the mainland. However, independent comparisons of series from Bioko with mainland series in the AMNH in 1988 and in the BMNH in 1993 show that the island population is distinct and may be known as

Pycnonotus virens poensis subsp. nov.

Holotype. Adult male, AMNH 297652, collected at Basepu, "Fernando Poo" (=Bioko), on 24 August 1929 by Jose G. Correia.

Diagnosis. Similar to nominate *P. virens*, but greener (less brown) dorsally, and brighter yellow ventrally (although still a dull yellow). These characters hold even when immature *poensis* are compared with adult *virens*.

Measurements of the type. Wing chord 75.5; tail 70; exposed culmen 10.0.

Etymology. Named for the island previously called Fernando Po.

Discussion. Although, to the extent possible, specimens of approximately equal museum age were compared, it turned out that foxing is slight in this species and does not override through time the subspecific characters.

Specimens examined. P. v. poensis: Bioko 48 (1902–1929). *P. v. virens*: Gabon 20 (1896–1957); Cameroon 81 (1905–1955); Zaire 29 (1909–1954); Angola 10 (1903–1906).

WHITE-CROWNED FOREST ROBIN *Fraseria (Malaenornis) cinerascens*

Two names are available within this species: *cinerascens* Hartlaub 1857 (TL Ghana) and *guineae* Bannerman (TL Portuguese Guinea). There are two distinct populations within this species, one pale and western, one dark and eastern, with the Dahomey forest gap separating the two. When Bannerman described *guineae*, apparently he used specimens from Cameroon and the "Congo" to represent *cinerascens* as those were, at that time, the material available in the BMNH closest to Ghana. He obviously believed *cinerascens* to represent the darker population; however he created a junior synonym of that name and the eastern, darker population is still without a name. It may now be known as

Fraseria (Melaenornis) cinerascens ruthae subsp. nov.

Holotype. Adult female, AMNH 764721, collected at Mabali, Tumba, "B.C." (=Zaire), on 9 November 1954 by James P. and Ruth T. Chapin. Field number 421.

Diagnosis. Dorsally much darker than *cinerascens*, being between Blue Black (Color 90) and Blackish Neutral Gray (Color 82) rather than near Indigo (Color 73) (Smithe 1974–1981). Head darker than back. Feathers of breast band strongly (*vs* weakly) edged with sooty black.

Measurements of type. Wing chord 60, tail 74.5, exposed culmen 13.

Etymology. Named in honour of Ruth Trimble Chapin.

Range. Forests east of the Dahomey forest gap, east to Zaire.

Specimens examined. *F. c. cinerascens*: Portuguese Guinea 3 (including type); Sierra Leone 6; Liberia 8; Niger 1; Nigeria 2. *F. c. ruthae*: Cameroon 16; Gabon 14; Zaire 4.

Acknowledgements

Field work in Liberia was conducted with the help and guidance of Wildlife and National Parks of the Forest Development Authority (see Dickerman *et al*. 1994). To Dr. Robert Prys-Jones, and Messrs Peter R. Colston, Michael P. Walters and Mark P. Adams at the British Museum (Natural History) the author expresses special thanks for their unstinting cooperation.

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IN BRIEF

THE TYPE-LOCALITY OF *NECTARINIA SENEGALENSIS GUTTURALIS* (LINNAEUS), 1766

The wide-ranging Scarlet-chested Sunbird *Nectarinia senegalensis* (Linnaeus) is a savanna woodland species, which extends from far West Africa east to Ethiopia, ranging southeast of the Lower Guinea rainforest to northern and central Namibia in the west and to Natal and Zululand in the east. Rand, in Peters' *Check-list* (1967), recognized six subspecies, but the precise total is actually greater, as he synonymized at least two valid races, *N. s. inaestimata* (Hartert), 1899, from coastal Tanzania, and *N. s. saturatior* (Reichenow), 1891, from Angola, with the southeastern terminal race *N. s. gutturalis* (Linnaeus), 1766, the type-locality of which will be considered below.

Certhia gutturalis Linnaeus, 1766, is based on a reference of Brisson, 1760, the original material believed to emanate from "Brasilia" (=Brazil), then a major Portuguese colony. As demonstrated by Vincent (1935), Brazil continued to be seen as the provenance of the material upon which *gutturalis* was founded for the remainder of the Eighteenth Century, until corrected by Shaw, *Gen. Zool.*, vol. viii, 1812, p. 255, to southern Africa. Levaillant, *Hist. Nat. Ois. d'Afr.*, vol. vi, 1808, p. 165, who through the course of his southern African travels between 1781 and 1784 at no time operated within the established range of *N. senegalensis*, referred to the species as "La Caffrerie", apparently on Dutch settler hearsay and through his close association with C. J. Temminck and the Leiden Museum. The Levaillant reference seemingly influenced Vincent (1935, *Bull. Brit. Orn. Cl.* 55: 97) to select the southeastern Cape Province as a restricted type-locality for *gutturalis*. This was not a good choice, however, as the eastern Cape was only opened up to the collecting of natural history specimens from about the time of A. Sparrman, who reached as far east as the Great Fish River during his southern African travels of *c.* 1772–1776. Later, Dr W. J. Burchell, who followed Levaillant in studying the southern African arid zone biota, collected extensively in the Cape between 1811 and 1815, to be followed in turn by Dr Andrew Smith between 1821 and 1837. None of these students turned up the Scarlet-chested Sunbird in the Cape Province. Reichenow (1905, *Vögel Afrikas*, vol. 3) lists no Cape records, and indicated that the southeastern range limits of *gutturalis* are in Natal, with listed occurrences from Durban, Pinetown, Pietermaritzburg, Eshowe, Ulundi and Lake St Lucia, where it still occurs. The currently accepted type-locality of *N. s. gutturalis* therefore lies some six to seven hundred miles (966–1127 km) to the southwest of the apex of the actual range, and requires to be adjusted to conform with it and such historical evidence as is available.

The Brazilian source of the basic Brissonian reference (*Ornith.*, vol. iii, 1760, p. 658, pl. 33, fig. 3), adopted by Linnaeus in the formulation of his *Certhia gutturalis*, indicates a possible Portuguese origin. Study of the relevant map in Hall & Moreau (1970, *Atlas of Speciation in African Passerine Birds*) shows that *Nectarinia senegalensis* in the southern aspects of its range is centred in the west along the Angolan coast and in the east from the region of Maputo in southern Mozambique south as far as Durban, Natal. Both regions were focal points as victualling stations (Luanda in the west and Delagoa Bay in the east) for shipping plying the Portuguese slave and spice trade routes during the Eighteenth Century. By mid-century there was also a lucrative market in western Europe for natural history specimens, including colourful tropical birds.

Either Angola or southern Mozambique requires to be seen as a possible type-locality for *N. s. gutturalis*, and in order to avoid disturbing the current subspecific taxonomy of the species, the choice of a Mozambique locality seems desirable. I therefore propose that the type-locality be adjusted on the basis of the above argument to the Maputo district, southern Mozambique, where the Scarlet-chested Sunbird is a relatively common species.

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12 October 1993

BOOKS RECEIVED

Jenni, L. & Winkler, R. 1994. *Moult and Ageing of European Passerines*. Pp. x+225, 652 figures. Academic Press. ISBN 0-12-384150-X. £40.00. 32 × 24 cm.

This is a most unusual book. Written by two Swiss ornithologists with extensive experience of systematic examination of birds caught at ringing stations, it is far the most complete account of the moult of most of the breeding species of passerines of central and northern Europe. The text is in two parts. Part 1 deals with moult strategies and the sequence of moult, and is particularly outstanding in its detailed treatment of partial and postjuvenile moults (which have tended to be treated rather sketchily in earlier accounts). Part 2 consists of species accounts, covering 58 species from nearly all the European passerine families. The detailed text, in both parts, is supported by a large number of clear schematic figures (of wing, tail, seasonal progress of moult etc.) and also—and this is the most obviously attractive feature of the book—by nearly 500 beautifully reproduced colour photographs of spread wings, several for each species, illustrating differences related to age, sex, and degree of wear of the feathers. These photographs, taken by a special method developed by Thomas Degen, constitute a unique documentation and will be invaluable for all European ringers and other ornithologists with an interest in plumage and especially in the ageing of birds in the hand. The book is produced to a high standard in a large format necessary to do justice to the photographs, and may confidently be predicted to become an essential part of every serious ringer's equipment.

Marchant, S. & Higgins, P. J. (eds) 1993. *Handbook of Australian, New Zealand and Antarctic Birds*. Vol. 2. Raptors to Lapwings. Pp. 984, 68 colour plates, distribution maps, text-figs. ISBN 0 19 553069 1. Oxford University Press, Melbourne. £150.00. 27 × 19 cm.

For a review of volume 1 of this important work, see *Bull. Brit. Orn. Cl.* 111: 175. In the Introduction to volume 2 (although published in 1993 not received for review until July 1994), the editors express their disappointment that so few critical reviews have appeared in the three years since volume 1 appeared. Surprisingly, at the time of their writing it seemed that no review at all had appeared in America. As far as the lack of critical comments on volume 1 is concerned, at least part of the reason may be that *HANZAB*, having benefited from the lessons learnt during the preparation of its predecessor, *BWP*, was generally excellent in content and in presentation and gave little scope for either nit-picking or constructive criticism.

In contrast to the many Antarctic species included in volume 1, this second volume has only two, the sheathbills. The treatment of species is the same, the text, though voluminous, clearly laid out with conspicuous headings and sub-headings and bold type, where needed, to indicate subdivisions of text within paragraphs. Two minor criticisms may be made, of presentation rather than content. The many sonagrams are shown on a rather heavy red lattice of 1 kHz intervals on the vertical scale and half-second intervals on the horizontal scale; the sonagrams themselves are grey, in many cases faint and far less conspicuous than the superimposed lattice. The sonagrams in *BWP*, printed larger and with a finer, less conspicuous lattice, are more satisfactory—except that a few of them in one volume were so faint that they had to be reprinted in a supplement. Sonagrams are evidently something of a headache for publishers of handbooks; many readers pay no regard to them, but for others they are essential and constitute a valuable baseline and stimulus for further research. A second minor criticism: breeding seasons are clearly summarised in the text, and the linear diagrams, showing months of egg-laying, merely repeat the text without adding anything; they could be dispensed with. A similar criticism could be made of the circular annual cycle diagrams in *BWP*, which have the added disadvantage of being hard to decipher.

These niggles apart, one can only be impressed by the immense amount of carefully compiled and clearly presented data, as well as by the superb series of 68 colour plates, most of which are by J. N. Davies, and some by P. Marsack, F. Knight and B. Jarrett. Reviewers' usual concluding remark, summing up such a book, that it will remain a major reference work for many years, is almost too obvious to be worth repeating.

Knox, A. G. & Walters, M. P. 1994. *Extinct and Endangered Birds in the Collections of the Natural History Museum*. British Ornithologists' Club Occasional Publications No. 1. Pp. 292. ISBN 0 9522886 0 5. £30.00, including packing and postage; obtainable from the Hon. Treasurer, Hammerkop, Frogmill, Hurley, Maidenhead, Berks SL6 5NL. 24 × 17 cm.

Almost as much as it is a duty for museums to publish catalogues of their type specimens, it is highly desirable that they publish annotated lists of their specimens of extinct and endangered birds. This important compilation was therefore a suitable choice for the first in the Club's new series of occasional publications; and it may be hoped that similar publications will follow for other major bird collections. The main text is preceded by a useful 17-page tabular summary of the taxa that are dealt with. For their list of endangered species or subspecies, the authors have used as their main basis, with modifications as necessary in the light of subsequent knowledge, the taxa categorised as endangered by King (1978–79; *Red Data Book, Aves*) and Collar & Stewart (1985, *Threatened Birds of Africa and Related Islands*). For each specimen, the following information is given: registered number; locality; date of collecting; source (i.e. collector, former collection from which obtained); nature of the specimen (skin, skeleton etc.) and its condition.

In soft covers but sturdily made and handsomely printed, this will be an essential source of data for museum curators, avian taxonomists, and conservationists.

BULLETIN

of the

BRITISH ORNITHOLOGISTS' CLUB

EDITED BY

Dr D. W. SNOW

Volume 114
1994

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(Compiled by Mary N. Muller)

All generic and specific names (of birds only) are indexed. New subspecific names are indexed in bold print under generic, specific and subspecific names.

CORRECTIONS TO TEXT

Page 17, line 36 *Numenius* not *Numemius*
Page 28, line 28 *leucophrys* not *leucophris*
Page 28, line 30 *Pinarocorys* not *Pynarocorys*
Page 32, line 17 *Troglodytes troglodytes* not *Troglodytes Troglodytes*
Page 61, line 36 *boissonneautii* not *biossonneauti*
Page 70, line 35 *Lagopus mutus* not *L. mutus*
Page 82, line 25 *platyrhynchos* not *platyrinchos*
Page 158, line 14 *savana* not *savanna*
Page 177, line 12 *reinwardtsi* not *reinwardtii*
Page 182, line 32 *Loboparadisea* not *Loboparadisaea*
Page 205, line 14 *Corvus* not *Corcus*
Page 237, line 1 *melanotos* not *melanotus*
Page 237, line 21 *Chlidonias* not *Childonias*
Page 266, line 22 *verreauxii* not *verreauxi*
Page 277, line 4 *Melaenornis* not *Malaenornis*

Vol. 114, page 210, line 16 add I. McAllan after Mrs R. Liversidge

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