In Twelve Sections.

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BRITISH BIRD BOOK

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200 PLATES IN COLOUR AND
NUMEROUS PHOTOGRAPHS,

EDITED BY
F. B. KIRKMAN · B. A. OXON

Contributors

J. L. BONHOTE
WILLIAM FARREN
F. C. R. JOURDAIN
W. P. PYCRAFT
EDMUND SELOUS
MISS E. L. TURNER
AND THE EDITOR

Artists

MISS W. AUSTEN
G. E. COLLINS
H. GRÖNVOLD
G. E. LODGE
A. W. SEABY
AND OTHERS

A COMPLETE WORK ON THE BIRDS, NESTS
AND EGGS OF GREAT BRITAIN

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THE
BRITISH·BIRD
BOOK

AN ACCOUNT OF ALL THE BIRDS, NESTS
AND EGGS FOUND IN THE BRITISH ISLES

EDITED·BY
F·B·KIRKMAN·B·A·OXON

ILLUSTRATED BY TWO HUNDRED COLOURED
DRAWINGS AND NUMEROUS PHOTOGRAPHS

VOLUME I

T·C·&·E·C·JACK
16·HENRIETTA·STREET·LONDON·W·C
AND·EDINBURGH
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PREFACE

Principal Objects.—One result of the growing interest taken during recent years in the study of ornithology is a considerable addition to our knowledge of the habits of British Birds. As no important comprehensive British work on the subject has appeared since the well-known Histories of Yarrell (revised and partly rewritten by Newton and Saunders, 1871-85) and Seebohm (1883-85), this knowledge remains inaccessible to those of us who are not prepared to search through a large and scattered literature, periodical and other. The sources of information available, moreover, before the above Histories appeared, have yet to be exhausted. Superior to both of them, in its account of a number of our species, is the monumental German work of the Naumanns, father and son, a new edition of which, revised by several prominent European ornithologists under the editorship of Dr. Carl Hennicke, was issued in 1897-1905 under the title of the *Naturgeschichte der Vögel Mitteleuropas*. But this edition, while giving very complete treatment to the description and distribution of most of the species, still leaves unrecorded many of the observations on their habits that have been made in our own and other countries. There is, therefore, place for a work that will bring together from every source, foreign and native, all the available information of any importance concerning the habits of British Birds. To do this, and to do it in a form interesting alike to the student of animal life and the general reader, is the chief object of the present undertaking. perform

Though we have a considerable body of information at our disposal concerning the habits of our native birds, it would be idle to deny that it must be regarded as very defective when compared with what we know about their structure or even their geographical distribution; so much so that it is impossible, and will no doubt long remain impossible, to systematise it, except to a limited extent, in such a way that the same class of evidence can be recorded with equal exactness and completeness under the head of each species. To take one example only: it is not possible at present to give, in the case even of many of our commoner birds, a detailed reliable description of the differences in the nuptial displays that occur at the beginning of the breeding season; yet one has only to turn over the pages of Darwin, Wallace, and their successors to realise how important is the evidence that the ornithologists might bring to the solution of the vexed question of sexual selection.

It is in approaching the study of birds with an eye to its value for the solution of this and similar problems, that we begin to realise not only its essential meaning and inner charm, but also the profundity of our ignorance concerning it. To know how little we know is in natural history the beginning of wisdom. Far from concealing this ignorance, it is part of the function of the present work to make it clear, and thus point the way to further research.

It is perhaps hardly necessary to add that the book appeals to the young naturalist in the interests of that kind of nature study which teaches him to regard an excursion into the country not as a raid but as a voyage of discovery. The appeal unfortunately cannot be limited to the young. If it could, the gun of the collector and his agents would not be heard so often in the land.

Other Objects.—In order to render the work complete for general purposes, all the information is given that is necessary to enable the reader to identify any British bird, as well as its nest and eggs. Descriptions overcharged with detail have been avoided, only what is strictly essential for purposes of recognition being given. In compiling the descriptions, good use has been made of standard works, but as the statements made in these works are not infrequently at variance, it has been thought necessary to verify every description in the present book by reference either to live specimens, or to skins in the British Museum and elsewhere, an arduous task which, if not overproductive of new discoveries, has at least increased our respect for the labours of those who have trodden the same thorny path.

A detailed account of the geographical distribution of our birds lies outside the scope of the work, which professes to deal comprehensively only with their habits, but short summaries embodying the most recent information will be found under the head of each species.

To meet the practical wants of the field naturalist there will be a special chapter on the art of bird-watching, and, as many naturalists now use the camera, this chapter will contain notes on the best methods of bird-photography.

PLAN

The Chapter.—The plan of the book differs in some important particulars from that generally adopted. Each chapter deals not with a species, but a Family, thus not only emphasising the relationship of the species, but facilitating comparative treatment and avoiding unnecessary repetition of statements that apply equally to the whole Family or Genus.

It has been found in many cases advisable to divide the chapter into sections,

the Genus generally providing a convenient division, the species in it being compared in respect to each class of activities, *e.g.* courtship, nesting habits, feeding habits, and so on. But rigid uniformity in arrangement has not been attempted. All the Finch Genera, for instance, owing to the marked similarity in the general habits of their species, are taken together. The same applies to the swallow, house-martin, and sand-martin, also to the jay and the magpie. On the other hand, the genus *Corvus* is divided into groups, in order to avoid unwieldy sections. Each writer has been left to arrange and treat the matter within each section of a chapter in the way best suited to his style and temperament, thus avoiding cut-and-dried uniformity with its resulting aridity. Any inconvenience that this course may have is met by the index, and to some extent by setting apart and arranging systematically the information that is most often needed for reference. This is placed at the head of the chapter under the title of Preliminary Classified Notes.

Preliminary Classified Notes.—These contain not only the information needed for reference, but certain classes of fact which lend themselves better to systematic or statistical than to literary treatment. Under the same head are placed the facts relative to the migration and distribution of the species, for these are subjects that can only properly be dealt with by specialists. All three categories are arranged on a uniform unvarying plan under the head of each species, as follows:—

1. Description of the male, female, and young, and their seasonal changes of plumage.
2. Distribution.
3. Migration.
4. Nest and eggs. Under this head is given a description of the nest, its site, the eggs, and information as to the number of eggs, the period at which the species begins laying, the share of the sexes in incubation, the period of incubation, and the number of broods.
5. The food, both of young and old, and the share of the parents in feeding the young.
6. The period of the year during which the species sings.

Supplementary Chapters.—In addition to the chapters on the habits of each Family and the Preliminary Classified Notes which form part of them, there will be found at the end of the book certain supplementary chapters dealing with special points.

The first of these contains descriptions of species which are almost extinct

within our shores, or which visit us at such rare and irregular intervals that they can only be called British by courtesy. Notes on their distribution are added. Their habits are not described, for as British birds they can scarcely be said to have any worth recording.

The second chapter, which must be taken in close connection with the descriptions of the species in Section 1 of the Preliminary Classified Notes, shows to what extent the Family and Generic structural characters can be used as a means of identification. It has been found convenient to place under the same head the periods and methods of the moults.

The third chapter gives an account of the general migratory movements to and from our shores, thus enabling the reader to see, in relation to the whole of which they are parts, the migrations of the separate species described in Section 3 of the Classified Notes.

The fourth chapter contains information concerning bird-watching and photography. A bibliography and an exhaustive index complete the work.

The Classification of the Orders and Families adopted in the book follows that of the Cambridge Natural History, except in respect to the arrangement of the Families within the Order Passeres, which is new, and based upon the researches of Mr. W. P. Pycraft.

SOURCES OF INFORMATION

Bibliographies consulted.—The value of a work like the present depends on there being at the disposal of the writers a body of evidence large enough to enable them to verify the accuracy of any statement open to question. A systematic effort has therefore been made to reach all the sources of information available; firstly, by consulting the published bibliographies, such as the *Zoological Record* (1864-), of which all the volumes have been examined, the *Bibliotheca Zoologica*, 1700-1880, Giebel, *Thesaurus Ornithologiae*, 1872-7, the *Subject-Index* at the British Museum, the Catalogue of the Zoological Society, the *Atlante Ornithologico* of Arrigoni degli Oddi, the list of Faunal publications in the *Proceedings of the U.S. National Museum*, ii. 359-482, and similar lists by Mr. Miller Christie in the *Zoologist*, 1890; secondly, by an inspection of the trade catalogues of the chief European and American booksellers, and lastly by seeking the information from leading ornithologists. Among those to whom special thanks are due for such help are Dr. Carl Hennicke, editor of the *Ornithologische Monatsschrift*; Dr. A. Reichenow of the Königl. Zoologisches Museum, Berlin; M. Louis Denise, editor of the *Revue française d'Ornithologie*; Ritter von Tschusi zu Schmidhoffen, editor of the *Ornithologisches Jahrbuch*; Dr. Hellmayr, Count Arrigoni degli Oddi, Mr. H. F.

Witherby, editor of the now well-known magazine, *British Birds*, and the Rev. F. C. R. Jourdain.

Works consulted.—The literature thus placed at our disposal included not only general works and monographs, but a very large number of foreign and native publications on Local Faunas, all of which have been consulted with varying results.

Good use has been made of periodical literature, foreign and native, which has proved to be the richest source of supply. In addition to consulting articles in the *Ibis*, *Ornis*, *Ornith. Monatsberichte*, *Ornith. Monatsschrift*, *Journal für Ornithologie*, *Aquila*, *Ornith. Jahrbuch*, and others referred to in the *Zoological Record*, it has been thought advisable to make a complete independent search through all the published volumes of the following periodicals :—*Zoologist* (1843-), *Field* (1853-), *Scottish Naturalist* (1871-92), and its sequel the *Annals of Scottish Natural History*, *Irish Naturalist* (1892-), the *North of England Naturalist*, *British Birds* (1907-), *Auk* (1884-), preceded by the *Bulletin of the Nuttall Ornith. Club* (1876-83), the *Zoologisches Garten* (1858-1905), now the *Zoologische Beobachter* (1906-), *Berajah*, and the new periodical, *Revue française d'Ornithologie*.

Bibliography of the Preliminary Notes.—For the Preliminary Notes on Migration and Distribution the following have proved of special value :—The Migration Reports published under the auspices of the British Association, the Migration Reports published in the *Bulletins of the British Ornithological Club*, the *Catalogue of Birds in the British Museum*, Mr. Eagle Clarke's Notes in the *Annals of Scottish Natural History*, Mr. R. M. Barrington's *The Migrations of Birds at Irish Light Stations*, 1900, E. Hartert, *Vögel der Paläarktischen Fauna* (in process of publication), F. C. R. Jourdain, *Eggs of European Birds* (in process of publication), the *Additions to our Knowledge of British Birds*, by H. F. Witherby, and N. F. Ticehurst in *British Birds*, vols. i. and ii. (1907-9), the *Manual* of Howard Saunders, Ussher and Warren's *Birds of Ireland*, Gätke, *Vogelwarte Helgoland*, Dr. Thienemann's reports from Rossitten, published in the *Journal für Ornithologie*, and of course Naumann and Dresser. To these must be added a number of Local Faunas, too numerous to mention.

For Oology the chief works consulted besides that of Jourdain already mentioned are Dresser's *Eggs of the Birds of Europe*, the large German works of Thienemann and Baedeker, and the smaller work by Rey on the Eggs of the Birds of Middle Europe.

The information given in the remaining Sections (4-6) of the Preliminary Classified Notes, dealing with nidification, incubation, food, etc., has been sought throughout the whole range of ornithological literature, periodical and other.

Though these researches have made it possible to supply a large amount of information not hitherto presented to English readers, the results are still far from adequate. In the case of the food of the species, good use has been made of Mr. R. Newstead's *Food of British Birds* and other works, but there has been no attempt at completeness, for nothing satisfactory can be done until we are in possession of that exhaustive inquiry the Board of Agriculture is understood to contemplate, and for which we are still patiently waiting.

In addition to books and periodicals already mentioned, the following are some of the more important of the many general and faunal British and foreign works consulted in respect to the subjects in Sections 4-6 just alluded to:—the *Histories* of Yarrell, Macgillivray, Seebohm; Brehm's *Tierleben*; the *Birds of Yorkshire*, 1907, by Nelson, Clarke, and Boyes; Dr. Saxby's *Birds of Shetland*, 1874; Lilford's *Birds of Northamptonshire*, 1895; H. A. Macpherson, *Fauna of Lakeland*, 1892; H. Stevenson, *Birds of Norfolk*, 1866-90; R. Gray, *Birds of the West of Scotland*, 1871; the series of Scotch Faunas published by J. A. Harvie-Brown and others; H. E. Forrest, *Fauna of N. Wales*, 1907; Coward, *Fauna of Cheshire*, 1909; O. V. Aplin, *Birds of Oxfordshire*, 1889; N. F. Ticehurst, *Birds of Kent*, 1909; V. Fatio, *Faune de la Suisse*, 1869; J. B. Bailly, *Ornithologie de la Savoie*, 1853-4; F. C. Keller, *Ornis Carinthiae*, 1890; and P. Kollibay, *Vögel der preussischen Provinz Schlesien*, 1905. These local Faunas are typical of many more that might be mentioned.

Correspondents.—That it has been possible to fill up some of the gaps in the information derived from the above-mentioned sources is due to the personal investigations of the writers and to the ungrudging help given by a number of correspondents.

Quotation of Sources.—In order to permit the reader to verify statements for which the writers of the chapters or Notes are not personally responsible, or which cannot be assumed to be well known, references to the authorities are given throughout.

A complete list of the authorities, both authors and correspondents, from whom information has been obtained will be found at the end of the book. It may be added that no use has been made of statements that show reasonable evidence of having been borrowed.

Responsibility of the Writers.—Each writer must be held solely responsible for the conclusions which he bases on the facts at his disposal. In order to reduce the chances of error, whether in facts or judgments, to a minimum—and in a subject so full of pitfalls as ornithology errors are inevitable, an arrangement was made by

which all the contributors kindly undertook to revise the whole work, thus ensuring that each should profit by the experience and judgment of his collaborators.

DRAWINGS

Bird Drawings.—The coloured drawings are intended to help the reader to identify the species he sees. For this purpose they must always, if faithful to their originals, be superior to a photograph or a black and white drawing, however good, for it is by its coloration that a bird is most quickly and certainly recognised. In order to ensure accuracy, the birds have, whenever possible, and in nearly all cases, been drawn from life, not from skins or stuffed specimens, which are often misleading; and, further, no effort has been spared to overcome the difficulties that still hinder accurate reproduction by the three-colour process.

The object of the coloured drawings is, however, to supply something more than a portrait of each species for purposes of identification. The traditional bird perched on the conventional twig, and regarding space with an eye of philosophic detachment from mundane affairs, can no longer satisfy a public familiar with the latest achievements of natural history photography. Each picture, therefore, besides being a portrait, will, apart from a few exceptions that explain themselves, offer a study of some habit of the bird or of one of its most characteristic and striking attitudes. It will show it in its natural surroundings, whether courting, singing, feeding its young, sitting on its nest, angry, pleased, alarmed, or inquisitive, thus combining the realism of the photograph with the added advantage of colour and artistic treatment. The task here imposed upon the artist has been far from easy, and in judging the results the great difficulties of the undertaking should be allowed for.

Coloured drawings are given of all the species described in the chapters, with the exception of a few, such as the chaffinch, Kentish-plover and little-stint, which a few words of comparison with closely allied species suffice to identify. The rare species described in the supplementary chapter at the end of the book are illustrated where necessary by line drawings only. In the case of these species coloured drawings would have served no purpose worth the increased price it would have been necessary to place on the book, for they only interest specialists, for whom descriptions and line drawings are adequate.

Egg Drawings.—On the egg plates all our British breeding species are represented, and in most cases it has been necessary to show two or more variant types of the egg of the same species. As the sole object of these plates is to aid in identification, no attempt has been made to show the finer variations; the same principle

has determined the relative amount of space allotted to different species, more being given to eggs of which the identification is likely to cause difficulty. Each drawing is natural size and set upon a background specially designed to show it to the best advantage. Arrangements are made by which, when the parts are finally bound up, these plates can be placed together at the end of the book. This will obviate the prolonged and irritating hunt for the egg required that often occurs when the plates are left dispersed through the text.

In the case of birds with white eggs, outline drawings to show the shape are given. As the eggs of the ducks are very much alike, and are consequently difficult to identify either by colour or shape, plates have been added showing the normal differences of colour in the down which they use for the construction of their nests.

Nest Photographs.—If coloration is of prime importance in the case of the bird and the egg, it is not so in the case of the nest. Here it is the form and the surroundings that matter, and for these a photograph suffices. When the nest does find a place in the coloured drawing, the photograph has been generally dispensed with.

Diagrams.—As the book is intended for the general reader as well as the ornithologist, non-technical terms are used wherever possible. Technical terms that are used can readily be understood by reference to the diagrams and figures and their accompanying glossary.

Typography.—In conclusion, it may be worth noting that, in order to fall into line with general biological practice, the names of the species are spelt without capitals, *e.g.* crow, corone; the name of the genus, family, order, class, with capitals, *e.g.* Crows, Corvus, Corvidae, Passeres, Aves. To avoid any possible ambiguity, specific names composed of two words are connected by a hyphen and in certain cases the words are run together, *e.g.* corn-bunting, yellow-bunting, blackheaded-gull, but lesser blackbacked-gull.

LIST OF THE SPECIES ILLUSTRATED IN COLOUR

FAMILY.	SPECIES.	FAMILY.	SPECIES.	FAMILY.	SPECIES.	FAMILY.	SPECIES.
<i>Corvidae</i> ,	Raven. Carriion-crow. Hooded-crow. Rook. Jackdaw. Magpie. Jay. Chough.	<i>Sylviinae</i> ,	Dartford-warbler. Goldcrest-wren. Willow-wren. Wood-wren. Reed-warbler. Marsh-warbler. Grasshopper-warbler. Sedge-warbler.	<i>Alcidae</i> ,	Razorbill. Guillemot. Black-guillemot. Little-auk. Puffin.	<i>Galli</i> ,	Pheasant. Partridge. Redlegged-partridge. Quail.
<i>Fringillidae</i> : <i>Fringillinae</i> ,	Greenfinch. Hawfinch. Chaffinch. Brambling. Goldfinch. Redpoll. Siskin. Twite. Linnet. House-sparrow. Tree- " Crossbill. " Bullfinch.	<i>Sturnidae</i> ,	Starling. Rosy-pastor.	<i>Laridae</i> ,	Sandwich-tern. Roseate-tern. Common-tern. Arctic-tern. Little-tern. Kittiwake. Blackheaded-gull. Common-gull. Herring- " Glaucous- " Gt. blackbacked-gull. Lesser black-backed-gull.	<i>Falconidae</i> ,	Hen-harrier. Buzzard. Golden-eagle. Sparrow-hawk. Peregrine. Hobby. Merlin. Kestrel. Osprey. Greenland-falcon.
<i>Emberizinae</i> ,	Corn-bunting. Yellow- " Reed- " Snow- " Cirl-bunting. Lapland-bunting.	<i>Oriolidae</i> ,	Oriole.	<i>Stercorariinae</i> ,	Arctic-skua. Great-skua. Buffon's skua. Pomatorhine-skua.	<i>Anatidae</i> ,	Greylag-geese. White-fronted goose. Bean-geese. Pink-footed-geese. Barnacle-geese. Brent- " Whooper-swan. Bewick- " Mute- " Shelduck. Mallard. Gadwall. Shoveler. Pintail-duck. Teal. Gargany. Wigeon. Pochard. Tufted-duck. Scaup. Golden-eye. Longtailed-duck. Eider-duck. Common-scooter. Velvet- " Goosander. Merganser. Smew.
<i>Alaudidae</i> ,	Skylark. Woodlark. Shorelark.	<i>Paridae</i> ,	Longtail-tit. Great-tit. Crested-tit. Cole-tit. Marsh-tit. Blne-tit.	<i>Limicolae</i> <i>Oedienemidae</i>	Stone-curlew.		
<i>Motacillidae</i> ,	Pied-wagtail. Grey- " Yellow- " Blueheaded-wagtail. Tree-pipit. Meadow-pipit. Water- " Rock- " Tawny- " Richard's- "	<i>Sittidae</i> ,	Nuthatch.	<i>Scolopacinae</i> ,	Woodcock. Common-snipe. Jack-snipe.		
		<i>Panuridae</i> ,	Bearded-tit.	<i>Charadriinae</i> ,	Dotterel. Ringed-plover. Golden- " Lapwing. Oyster-catcher. Avocet. Turnstone. Grey-plover.		
		<i>Laniidae</i> ,	Great grey-shrike. Redbacked-shrike.	<i>Tringinae</i> ,	Dunlin. Purple-sandpiper. Green-sandpiper. Curlew-sandpiper. Sanderling. Knot. Godwit. Ruff. Common-sandpiper. Redshank. Curlew. Rednecked-phalarope.	<i>Ibididae</i> ,	Spoonbill.
		<i>Musicapidae</i> ,	Spotted-fly-catcher. Pied-flycatcher.			<i>Ardeidae</i> ,	Heron. Bittern.
		<i>Hirundinidae</i> ,	Swallow. House-martin. Sand- "			<i>Pelecanidae</i> ,	Cormorant. Shag. Gannet.
		<i>Picidae</i> ,	Wryneck. Green-wood-pecker. Gt. spotted- and lesser spotted-woodpecker.			<i>Procellariidae</i>	Manx - shear-water. Fulmar. Petrels.
<i>Certhiidae</i> ,	Tree-creeper.	<i>Cypselidae</i> ,	Swift.	<i>Otitidae</i> ,	Great-bustard.	<i>Podicipididae</i> ,	Great crested-grebe. Little-grebe. Eared-grebe, etc.
<i>Troglodytidae</i> ,	Wren.	<i>Caprimulgidae</i> ,	Nightjar.	<i>Rallidae</i> ,	Corncrake. Spotted " Water-rail. Waterhen. Coot.	<i>Colymbidae</i> ,	Great northern-diver. Blackthroated-diver. Redthroated-diver.
<i>Cinclidae</i> ,	Dipper.	<i>Strigidae</i> ,	Barn-owl. Longeared-owl. Shorteared- " Tawny- " Little- " Snowy- "				
<i>Turdidae</i> : <i>Turdinae</i> ,	Mistle-thrush. Song-thrush. Redwing. Fieldfare. Blackbird. Ring-ouzel. Wheatear. Whinchat. Stonechat. Redstart. Black-redstart. Bluethroat. Redbreast. Nightingale. Hedge-sparrow.	<i>Coraciidae</i> ,	Roller.	<i>Galli</i> ,	Capercaillie. Black-grouse. Red-grouse. Ptarmigan.		
		<i>Upupidae</i> ,	Hoopoe.				
		<i>Alcedinidae</i> ,	Kingfisher.				
		<i>Cuculidae</i> ,	Cuckoo.				
		<i>Columbidae</i> ,	Ring-dove. Rock- " Stock- " Turtle- "				
<i>Sylviinae</i> ,	Whitethroat. Lesser- " Blackcap. Garden-warbler.	<i>Pteroclididae</i> ,	Sandgrouse.				

NOTE.—Some of the species appear in separate pictures on the same plate, a few others, which in nature are seen frequently together, are represented in the same picture.

WRITERS, ARTISTS, PHOTOGRAPHERS

WRITERS

J. L. BONHOTE, M.A. Secretary of the British Ornithologists' Union, and of the Migration Committee of the British Ornithological Club.

WILLIAM FARREN.

F. C. R. JOURDAIN, M.A. Oxford (The Rev.). Author of *Eggs of European Birds*, etc.

F. B. KIRKMAN, B.A. Oxford. Formerly Assistant-Master at the Merchant Taylors' School, E.C.

W. P. PYCRAFT. Assistant in charge of the Osteological Collections at the British Museum (Natural History Department), author of the *Story of Bird Life*, *A Book of Birds*, *Living Animals of the World* (part), etc.

EDMUND SELOUS. Author of *Bird-Watching*, *The Bird Watcher in the Shetlands*, *Bird Life Glimpses*.

A. LANDSBOROUGH THOMSON. Secretary of the Aberdeen University Bird-Migration Inquiry.

EMMA L. TURNER. Joint-author of *The Home Life of some Marsh Birds*.

ARTISTS

WINIFRED AUSTEN.

G. E. LODGE.

G. E. COLLINS.

H. GRÖNVOLD.

A. W. SEABY.

PHOTOGRAPHERS

F. E. DANIEL.

SETON P. GORDON.

W. FARREN.

CHARLES REID.

RILEY FORTUNE.

E. L. TURNER.

C. J. KING.

THE EDITOR.

AND OTHERS.

LIST OF CHAPTERS AND WRITERS¹

<i>Chapter.</i>	<i>Writer.</i>	<i>Chapter.</i>	<i>Writer.</i>
CROWS,	F. B. KIRKMAN.	KINGFISHER, . .	W. P. PYCRAFT.
FINCHES,	E. SELOUS.	CUCKOO,	F. B. KIRKMAN.
BUNTINGS,	E. SELOUS.	PIGEONS,	W. P. PYCRAFT.
LARKS,	W. P. PYCRAFT.	SAND-GROUSE, . .	F. C. R. JOURDAIN.
WAGTAILS AND } PIPITS, }	E. SELOUS.	AUKS,	E. SELOUS.
TREE-CREEPER, . .	E. L. TURNER.	GULLS,	F. B. KIRKMAN.
WREN,	E. L. TURNER.	TERNs,	F. B. KIRKMAN.
DIPPER,	F. B. KIRKMAN.	SKUAS,	E. SELOUS.
THRUSHES,	{ F. B. KIRKMAN and E. L. TURNER.	STONE-CURLEW, . .	W. FARREN.
WARBLERS,	{ E. L. TURNER, F. B. KIRKMAN, WM. FARREN.	WADERS: } PLOVERS, } SANDPIPERS, } ETC., }	W. P. PYCRAFT and W. FARREN.
STARLINGS,	F. B. KIRKMAN.	BUSTARD,	F. C. R. JOURDAIN.
ORIOLE,	F. C. R. JOURDAIN.	RAILS,	E. SELOUS.
WAXWING,	W. P. PYCRAFT.	GROUSE AND } PHEASANTS, }	W. P. PYCRAFT.
TITS,	E. L. TURNER.	EAGLES AND } HAWKS, }	W. P. PYCRAFT.
NUTHATCH,	E. L. TURNER.	SWANS,	E. L. TURNER.
BEARDED-TIT, . .	E. L. TURNER.	DUCKs, GEESE, . .	W. P. PYCRAFT.
SHRIKES,	E. L. TURNER.	SPOONBILL,	F. C. R. JOURDAIN.
FLYCATCHERS, . .	E. L. TURNER.	HERON AND } BITTERN, }	E. SELOUS.
SWALLOWS,	F. B. KIRKMAN.	CORMORANTS } AND GANNET, }	F. B. KIRKMAN.
WRYNECK,	W. P. PYCRAFT.	PETRELS,	E. SELOUS.
WOODPECKERS, . .	W. P. PYCRAFT.	GREBES,	W. P. PYCRAFT.
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OWLS,	W. P. PYCRAFT.		
ROLLER,	F. C. R. JOURDAIN.		
HOOPOE,	W. P. PYCRAFT.		

SUPPLEMENTARY CHAPTERS

RARE BRITISH BIRDS.

CLASSIFICATION OF BRITISH BIRDS. By W. P. PYCRAFT.

DISTRIBUTION AND MIGRATION OF BRITISH BIRDS. By J. L. BONHOTE and
F. B. KIRKMAN.

BIRD WATCHING AND PHOTOGRAPHY. By F. B. KIRKMAN.

BIBLIOGRAPHY.

INDEX.

¹ This list is liable to alteration ; a complete Contents Table with page references will be issued
on the completion of the work.

FIG. 1.

1. Upper mandible (often, but incorrectly, called maxilla) of the beak (*L. rostrum*).
2. Lower mandible.
3. Ridge (*L. culmen*).
4. Cutting edge (*L. tomium*; pl. *tomia*). The word Commissure, referring to the line of junction between the two mandibles, is also used.
5. Angle of the lower mandible, a projection present in many birds, sometimes called gonys (*Gr. gonu*, a knee, hence bend; not to be confused with *Gr. genus*, underjaw or *genys*).
6. Lores, space between bill and eye.
7. Nostrils (*L. nares*).
8. Rictal or gape bristles (*L. rictus*, opened mouth).
9. Flanges, margins of gape.
10. Forehead (*L. frons*), adj. *frontal*.
11. Crown (*L. vertex*).
- 11a. Nape (*L. nucha*), adj. *nuchal*.
12. Ear coverts or auriculars (*L. auricula*, ear).
13. Malar region or cheek (*L. mala*).
14. Hind-neck (*L. cervix*).
- 14a. Side of neck.
- 14b. Fore neck.
15. Back (*L. dorsum*), adj. *dorsal*.
16. Scapulars (feathers over scapulæ or shoulder-blades).
17. Rump (*L. uropygium*).
18. Upper tail coverts (*L. tectrix*, a covert; pl. *tectrices*).

19. Under tail coverts.
20. Tail feathers (*rectrices*, so-called because they direct flight).
21. Chin (*L. mentum*).
22. Throat (*L. gula*), adj. *gular*.
23. Pectoral band or gorget (see breast).
24. Breast (*L. pectus*), adj. *pectoral*.
25. Flanks, sides.
26. Belly (*L. abdomen*).
27. Lesser or minor wing coverts (*L. tectrices minores*).
28. Median or middle wing coverts (*L. tectrices medice*).
29. Major or greater coverts of secondaries (*L. tectrices majores*).
30. Major coverts of primaries (*L. tectrices majores*).
31. Secondaries; known also as cubitals (supported by the cubitus or ulna), ulnar quills (*remiges secundarii*; *L. remex*, oarsman).
32. Primaries; known also as manuals (supported by the manus or hand), hand quills (*remiges primarii*).
33. Bastard wing (*L. ala spuria* or *alula*).
34. Tibial feathers, covering the tibiotarsus, or shortly tibia, which, with its accompanying degenerate fibula, corresponds to the human leg between the ankle and knee. At its lower end the tibia fuses in adult birds with the three upper or proximal tarsals (ankle bones). Hence the double name—tibiotarsals, called "thigh" in error.

35. Tarso-metatarsus, or shortly metatarsus, formed by the fusion of the five lower or distal tarsals (ankle bones) and the three middle metatarsals (instep); called "shank" in error. The back of the tarsus is called the *planta* (sole). The bird walks on its toes only.
36. Acrotarsium (Gr. *akros*, uppermost; *tarsos*, foot between toes and heel), the front of the metatarsus.
37. Acropodium (Gr. *akros*, uppermost; *pous*, a foot), the front of the toes. The under parts of the toes are the pads. The first toe is known as the hallux.

FIG. 2.

As in Fig. 1.

FIG. 3.

- Cere (L. *cera*, wax), wax-like skin which covers the base of the upper mandible in some species, *e.g.* hawks and eagles.
- Tooth, not to be confused with the tooth in the ordinary sense. No existing birds have teeth.
9. As in Fig. 1.

FIG. 4.

Nail or hook (*dertrum*).
Lamellæ, tooth-like serrations, developed especially in ducks and geese, and used for sifting when feeding.
Adj. lamellated.

FIG. 5.

As in Fig. 1. It shows the under wing coverts (Lesser 27a; Median, 28a, etc.), the axillaries (L. *axilla*, armpit), and the vent (*crissum*).

FIG. 6.

1. Pupil. 2. Iris; *pl.* irides. 3. Eyelid.
4a. Anterior canthus. 4p. Posterior canthus.

FIG. 7.

1. Barrel (L. *calamus*, reed), which is hollow and transparent.
2. Shaft (L. *rhachis*), filled with pithy matter. The term quill, which has no connection with the Latin *calamus*, is rightly applied to the barrel and shaft taken together.
3. Outer web or vane (L. *vexilla*). 4. Inner web or vane.
5. Emarginate, having the margin broken by a notch.

ALPHABETICAL LIST OF THE TERMS ILLUSTRATED BY THE FIGURES, WITH ADDITIONS

- Abdomen (belly), 1. 26.
Acropodium, 1. 37.
Acrotarsum, 1. 36.
Aftershaft (*hyporhachis*), a supplementary and, as a rule, relatively small feather attached to the inner and lower surface of the main shaft.
Ala spuria (bastard wing), 1. 33.
Alar bar, a bar (white, black, etc.) across the wing (L. *ala*).
Albinism, a bird with plumage abnormally white. Cf. Melanism.
Alula (bastard wing), 1. 33.
Apex, the distal end of a feather, beak, toe; *adj.* *apical*. Cf. Distal.
Auricula, auriculars (ear coverts), 1. 12.
Axillaries, 5.
Back, 1. 15.
Barrel, 7. 1.
Base, the root or proximal part; *adj.* *basal*.
Bastard wing, 1. 33.
Belly, 1. 26.
Breast, 1. 24.
Brood (A.S. *brid*, that which is hatched or produced by means of warmth; a young bird), the nestlings collectively; to brood, cover the young with the wings. Cf. Incubate.
Calamus (barrel), 7. 1.
Canthus, 6. 4a, 4p.
Cera, cere, 3.
Cervix (hind-neck), 1. 14.
Cheek, 1. 13.
Chin, 1. 21.
Commissure, line of junction between the two mandibles.
Compressed, pressed together from the sides or laterally. Cf. Depressed.
Contour feathers (*pennæ*, *plumæ*), all which are externally visible, and so determine the contour of the body. They include the wing and tail quills. Cf. Down feathers, Filo-plumes.
Coverts, 1. 18, 19, 27-30; 5.
Crissum (vent), 5.
Crown, 1. 11.
Cubitals, cubitus (secondaries), 1. 31.
Culmen (ridge), 1. 3.
Cuneate, wedge-shaped.
Cutting edge, 1. 4.
Deurved, curved downwards.
Depressed, pressed down vertically. Cf. Compressed.
Dertrum (nail or hook), 4.
Distal, the end distant from the centre or axis of the body; *e.g.* the tip of the beak is its distal end. Cf. Apex.
Dorsal, dorsum (back), 1. 15.
Down feathers (*plumulæ*), soft feathers hidden below the contour feathers, except when the latter are absent as on the neck of certain Vultures where the down feathers form a ruff. In nestling birds the Downs may be of two kinds: the pre-pennæ, which are replaced by contour feathers, and the pre-plumulæ, replaced by adult down feathers.
Emarginate, 7. 5.
Family, division of an Order.¹
Fibula, 1. 34.
Filo-plumes (*filo-plumæ*), hair-like feathers, with the remnant of a vane at the tip, which cluster round the bases of the contour feathers. The stiff "bristles" (Figs. 1. 8) are contour feathers that have entirely lost their vanes.
Flanges of gape, 1. 9.
Flanks, 1. 25.

¹ EXAMPLE: the raven (*Corvus corax*) is a *species* of the *genus* *Corvus*, which is a division of the *Family* *Corvidæ* or Crows, which in turn is a division of the *Order* *Passeres* of the *Class* *Aves* or Birds. Triple terms, *e.g.* *Corvus corax corax*, *Corvus corax varius*, *Corvus corax hispanus*, etc., are used to distinguish *sub-species* or local races.

Fledgling (Middle English *flegge*, "ready to fly,"), the young bird from the time it is ready to fly till the completion of the growth of its wing quills and tail. (See Nestling.)

Forehead, 1. 10.

Frons (forehead), 1. 10.

Gape bristles, 1. 8.

Genus; pl. *genera*, division of a Family.¹

Genys (underjaw), 1. 5.

Gonys (bend), 1. 5.

Gorget, pectoral band, 1. 23.

Graduated, applied to tail of which the feathers diminish gradually in length on each side, as in the woodpecker.

Granulated, applied to the surface of the metatarsus when almost smooth (created, booted).

Gula, gular (throat), 1. 22.

Hackles, lanceolate feathers, as on the neck of fowls (see Lanceolate).

Hallux, the first or hind toe.

Hind-neck, 1. 14.

Incubate (*L. incubare*), to sit on eggs; *subst.* incubation.

Cf. Brood.

Iris, pl. *irides*, 6. 2.

Lamellæ (serrations), 4.

Lanceolate, elongated and pointed (see Hackles).

Lores, 1. 6.

Mala, malar region (cheek), 1. 13.

Mandible, 1. 1-2.

Mantle, term for the feathers of the back (Fig. 1, 15), the scapulars (Fig. 1, 16) and wing coverts taken collectively.

Manuels (primaries), 1. 32.

Maxilla (1. 1).

Melanism, a bird with plumage abnormally black.

Mentum (chin), 1. 21.

Metatarsals (metatarsus), 1. 35.

Nail (dertrum), 4.

Nape, 1. 11a.

Neck, side of, 1. 14a; fore-neck, 14b.

Nestling, the young bird before it is ready to fly. (See Fledgling.)

Nidicolæ (*L. nidus*, nest; *colere*, to inhabit) or Altrices, nestlings hatched in a helpless condition and unable to leave the nest for several days. Cf. Nidifugæ.

Nidifugæ or Præcoces (*L. nidus*, nest; *fuga*, flight), nestlings able to quit the nest and run the day on which they are hatched. Cf. Nidicolæ.

Nucha (nape), 1. 11a.

Order, division of a Class.¹

Pads, underparts of the toes.

Pamprodactylous (Gk. *pam*, *pan*, all; *daktylos*, finger, applied to a foot having all the toes pointing forward).

Pectinated (*L. pecten*, a comb), having teeth like a comb; e.g. the middle claw of the heron's foot is pectinated.

Pectus (breast), pectoral, 1. 24.

Planta (sole), 1. 35.

Primaries, 1. 32.

Proximal (*proximus*, next), the end next the centre or axis of the body. Cf. Distal.

Pupil, 6. 1.

Quill, barrel and shaft together, 7.

Rectrices (tail-feathers), 1. 20.

Remex, remiges (quills), 1. 31-32.

Reticulated (*L. rete*, a net), applied to the covering of the leg when its scales or scutes (*L. scutum*, a shield) are arranged like a mosaic, instead of overlapping transversely. See the planta of the further leg in the Figure.

Rhachis (shaft), 7. 2.

Rictal bristles (gape bristles), 1. 8.

Ridge of the beak, 1. 3.

Rostrum (beak).

Rump, 1. 17.

Scapulars, 1. 16.

Scutellæ, scales.

Scutellated (*L. scutum*, a shield), applied to the scaly covering of the leg. Cf. Reticulated, Granulated.

Secondaries, 1. 31.

Shaft, 5. 2.

Shank, properly metatarsus, 1. 35.

Sole (back of the metatarsus), 1. 35.

Species, division of a Genus.¹

Speculum (*L. speculum*, a mirror), applied to the metallic alar bar of the Duck tube. (See Alar.)

Superciliar (*super*, above, *cilium*, eyelid), just above the eye.

Tarsals, 1. 34-35.

Tectrix, tectrices. See Coverts.

Thigh, properly tibiotarsus, 1. 34.

Throat, 1. 22.

Tibial feathers, 1. 34.

Tibiotarsus, part between ankle and knee. See under 1. 34.

Toes, 1. 36, 37.

Tomium (cutting edge), 1. 4.

Tooth, 3.

Ulnar quills, 1. 31.

Uropygium (rump), 1. 17.

Vane, 7. 3-4.

Vent (crissum), 5.

Vertex (crown), 1. 11.

Vexilla (web, vane), 7. 3-4.

Web, 7. 3-4.

Zygodactylous (Gk. *zygon*, a yoke, pair; *daktylos*, finger), applied to a foot which has the toes arranged in pairs, two directed backward (I., IV.), two forward (III., II.).

¹ See footnote on previous page.

EXPLANATION OF THE PRELIMINARY CLASSIFIED NOTES

THE Notes that appear at the beginning of the chapters under the head of each species are arranged on a uniform plan, as follows:—

Nomenclature.—To the English name is appended the scientific name in accordance with the rules of the Fifth International Zoological Congress, but where this differs from the well-known names adopted by Howard Saunders, the latter have been added in brackets. The use of trinomials has been avoided except in the rare cases where two races of the same species occur in this country. The authority for the scientific name is given, but where applicable only to the specific and not to the generic name, is given in brackets, *e.g.* *Garrulus glandarius* (Linnæus). The popular names are also given, to which are added the principal corresponding French, German, and Italian terms, these, with English, being recognised as the four international languages by the International Ornithological Congress. There appears to be no generally accepted rule for the accentuation of the Latin names. For the name of the genera and species, that adopted in Howard Saunders's *Manual* has been followed, and is indicated by accents, *e.g.* *Córvus coróne*. In respect to the names of the Families and Subfamilies, the usage of the British Museum is to accent the termination *-idae*, but not *-inae*, *e.g.* *Corvídae* (pronouncing the *i* as in "side") and *Córvinae* (pronouncing the *i* as in "pin"). The Continental practice, which is tending to become general, is to sound the *i* in both terminations as *ee*.

Descriptions.—Of the male, the characters strictly essential for identification alone being given, and those most distinctive of the species being placed first; of the female, in so far only as she differs from the male; and of the young, up to the first autumn moult (unless otherwise stated), in so far only as they differ from one or both parents. The autumn and winter plumage of the adults and young is not given unless the alteration is marked enough to make identification difficult without further information. In connection with these descriptions should be read Mr. W. P. Pycraft's chapter on Classification published at the end of the book. The length given is the average, and is measured from the tip of the beak to the end of the tail.

Distribution.—Under this head it is intended to define briefly the breeding range of each bird, both outside and in the British Isles. In the case of species

which are divided into local races, British forms alone receive special attention, the distribution of the other forms being roughly indicated. The zoo-geographical regions (Palæarctic, etc.) referred to are shown on the map, p. xix, which is that of Sclater. His system is here adopted, not because it is necessarily the best, but because it is for the time being sanctioned by custom.

Migration.—In respect to the migrations, it should be noted that the term *resident* is applied to the species. A species may, for instance, be present in this country throughout the year, and yet, owing to emigration and immigration, be composed to a greater or less extent of different individuals at different times. In other words, a species may be resident but not stationary. A *bird of passage* is one that visits our shores only on its way to its destination elsewhere. The other terms explain themselves.

Nest and Eggs.—The statement under *Nest* does not mean that a nest is necessarily composed of all the materials mentioned, but that all or some of them may enter into its composition. The periods of incubation must be regarded as approximate only, for the sources of information frequently omit to state how the period was reckoned, whether from the last egg laid or another.

Food.—These are unavoidably incomplete, owing to lack of reliable information.

Song Period.—See previous note on Food.

Authorship.—At the head of every set of Notes will be found the names of the compilers, the share of each of the latter being shown by the initials placed in square brackets at the end of the Note for which he is responsible.

OUTLINE MAP OF THE WORLD SHOWING THE SIX ZOO-GEOGRAPHICAL REGIONS
(AFTER P. L. AND W. L. SOLATER)

100

Plate A

Eggs of the Crow Family

1. Magpie
2. Jay
3. Jackdaw
4. Carrion Crow
5. Chough
6. Hooded Crow
7. Rook
8. Raven

UNIV. OF
CALIFORNIA

THE CROW FAMILY

[ORDER: *Passeriformes*. FAMILY: *Corvidæ*]

PRELIMINARY CLASSIFIED NOTES¹

[F. C. R. JOURDAIN. F. B. KIRKMAN²]

RAVEN [*Corvus corax*, Linnæus. Corbie, corbie-crow, or great corbie-crow, to distinguish it from the next species. French, *corbeau*; German, *Kolkrabe*; Italian, *corvo imperiale*].

1. **Description.**—Black all over with purplish blue reflections. It may be distinguished from the carrion-crow by its larger size, and by having the end of the tail distinctly rounded, that of the smaller species being almost square. Length 25 in. [634.5 mm.]. (Pl. 1.) Female smaller. The young are duller in plumage, and do not attain to quite the full lustre of the adults till after their second autumn moult. [F. B. K.]

2-3. **Distribution and Migration.**—A Palæarctic and Nearctic species, which has been separated into several Geographical races. Our British birds belong to the form which is found over the greater part of the Continent, with the exception of the Iberian peninsula, where it is replaced by the Spanish race, *C. corax hispanus*; while the Faroes, Iceland, Corsica and Sardinia, North-West Africa, and the Greek islands are inhabited by other local forms. In England, though not uncommon half a century ago, it is now rare except in the Devonian Peninsula, Lakeland, etc., but it is still numerous in Wales, and in some parts of Scotland, as well as the West of Ireland, especially near the coast. Apart from a tendency to assemble in flocks at times during the winter, this species appears to be stationary throughout its range. [F. C. R. J.]

4. **Nest and Eggs.**—Nesting place: formerly often in high trees in open country, but now chiefly on sea cliffs or crags, and rarely in ruins. Nest: chiefly

¹ See Explanation, p. xvii.

² In the case of the *Nest and Eggs*, Mr. Jourdain is responsible for the description of the nests, sites, and eggs, Mr. Kirkman for the remainder.

stout sticks, roots, stems, sometimes seaweed, solidified with earth and lined with wool, hair, fur, fibres, grass, and other soft material. (Pl. I.) Both sexes share in its construction (Bailly, *Ornith. de la Savoie*; Saxby, *B. of Shetland*; W. Borrer, *B. of Sussex*). The eggs, usually 4-6, rarely 3 or 7, in number, are generally greenish, blotched and flecked with various shades of brown up to black, and underlying markings of ashy grey, but the ground-colour is sometimes clear blue, and occasionally the markings are almost entirely absent. (Pl. A.) A very rare reddish type has occurred in the Shetlands (A. Newton, *Ootheca Wolleyana*, i. p. 524). Average size of 79 British eggs, 1.96×1.32 in. [49.8×33.5 mm.]. Laying begins usually in February-March. Both sexes incubate, Brehm's statement to the contrary notwithstanding. Period of incubation 18-20 days. One brood. [F. C. R. J.—F. B. K.]

5. Food.—Practically omnivorous; but usually carrion; occasionally wounded or weakly sheep, also rodents, birds, reptiles, amphibians, fish, molluscs, crustaceans, worms, insects, spiders, eggs, fruit, grain. The young are fed by both parents on carrion, especially the placenta of sheep, on worms, insects, small mammals, young birds, eggs, frogs. [F. B. K.]

6. Song Period.—See p. 12.

CARRION-CROW [*Corvus corone*, Linnæus. Corbie-crow, gor-crow, cloup. French, *corneille*; German, *Rabenkrähe*; Italian, *comacchi nera*].

1. Description.—Black with purple and green reflections. (See above under Raven.) Length 19 in. [482 mm.]. (Pl. 2.) Female smaller and duller. The young before the first autumn moult lack the reflections. [F. B. K.]

Fig. 1.—CARRION-CROW.
(Natural size.)

2. Distribution.—On the Continent of Europe it is chiefly confined to the west and south-east: the Iberian Peninsula, France, the Low Countries, West Germany, Switzerland, North Italy, some districts of Austro-Hungary and South

Russia. Although general throughout England and Wales, and not uncommon in the south of Scotland, it is absent from Ireland and the Isle

Photo by F. E. Daniel

Raven's Nesting Site

Photo by F. E. Daniel

Raven's Nest

Photo by Riley Fortune

A Rook's Nest

no vinyl
aluminum

of Man, and only of rare occurrence in the north of Scotland. For more exact details the works of Diederich (*Die geographische Verbreitung der echten Raben*, 1884-8) and Matschie (*Jour. für Ornith.*, 1887, p. 617) should be consulted. Although it has been asserted that this species is also found in the Balkan Peninsula, the statement is probably erroneous. A closely allied race inhabits E. Asia and Japan. [F. C. R. J.]

3. **Migration.**—Flocks from the opposite coast of the Continent arrive from September to November on our south-east shores, from Kent to the Humber, subsequently spreading over the eastern counties. These immigrants are seen returning to their continental breeding grounds from early in February to mid-April (*Brit. Assoc. Report*, 1903, p. 298.) [F. B. K.]

4. **Nest and Eggs.**—Nesting place: when inland, almost always in trees where they exist, on cliff-ledges by the sea, bushes, also occasionally on the ground in treeless districts. Nest: as the raven's, but smaller. (Pl. II.) Both sexes share in its construction. The eggs, usually 4-5, rarely 6, in number, resemble those of the raven, but are smaller. They are greenish, flecked with various shades of brown and ashy grey, and it is not uncommon to find one egg much lighter than the rest. A variety with a blue ground, sometimes without markings, is also found. (Pl. A.) Average size of 100 eggs, 1.71×1.18 in. [43.5×30.1 mm.]. Laying begins in April. Both sexes incubate. Period of incubation 18-21 days. The young remain in the nest 4-5 weeks (S. E. Brock, *in litt.*; A. Taylor, *in litt.*). One brood. [F. C. R. J.—F. B. K.]

5. **Food.**—As the raven, old and young. Both parents share in feeding the latter. [F. B. K.]

6. **Song Period.**—See p. 19.

HOODED-CROW [*Córvus córnix*, Linnæus. Royston-crow, hoody, grey-crow, greyback, dun-crow, Denmark-crow, saddleback-crow, chough. French, *corbeau mantelé*; German, *Nebel-rabe* or *Nebelkrähe*; Italian, *cornacchia*].

1. **Description.**—Distinguished from the carrion-crow only by its grey mantle and underparts. The female is smaller and duller. The young do not develop the purple and green reflections till after the first autumn moult. Hybrids of *C. corone* and *C. cornix* show every gradation between the two species. (Pl. 2.) [F. B. K.]

2. **Distribution.**—On the Continent it is plentiful in Scandinavia and

Russia, as well as in Denmark, E. Germany, Austro-Hungary, Italy, and the Balkan Peninsula. It is also found in the Faroes, the Balearic Isles, Sicily, Crete, and Cyprus, while a local race, *C. cornix sardonius*, inhabits Sardinia and Corsica. Eastward its range extends in Asia to the Lena. In the British Isles the hooded-crow is practically confined to Ireland, the Isle of Man, and North Scotland, during the breeding season. The ranges of this and the preceding species overlap, however, in Scotland, and have not been exactly worked out. A few pairs have been known to stay to breed in some of the English counties, especially in the north and east. [F. C. R. J.]

3. **Migration.**—Large flocks arrive on our east coasts from the east of Europe from about the end of September to mid-October. These winter chiefly in the eastern counties, and return to the Continent in February or April. A separate immigration of flocks coming from Scandinavia is observed, chiefly in the Orkneys and Shetland, during October and November, the flocks spreading thence to the southward as far as the English northern shires. The return takes place in March and April (*Brit. Assoc. Report*, 1903, p. 298). [F. B. K.]

4. **Nest and Eggs.**—Nesting place and nest: like the carrion-crow's, but as in the British Isles it breeds farther north, nests on or near the ground are more common. Both sexes share in building the nest (Naumann). The eggs, 4-5, sometimes 6, in number, resemble those of the carrion-crow, but are often rather greener and slightly smaller. Red eggs have been taken in Sweden. Average size of 100 eggs, 1.62×1.14 in. [41.2×29 mm.]. Laying begins in April, occasionally in March. Both sexes incubate. The period of incubation is 18-19 days. One brood, like the rest of the Corvidæ. [F. C. R. J.—F. B. K.]

5. **Food.**—As the carrion-crow. Both parents feed the young (F. Heatherley, see p. 25).

6. **Song Period.**—See p. 19.

ROOK [*Córvus frúgilegus*, Linnæus. Whitefaced or barefaced-crow. French, *freux*; German, *Saatkrähe*; Italian, *corvo nero*].

1. **Description.**—Black with bright violet and also blue gloss. Length 19 in. [482 mm.]. (Pl. 3.) Female slightly smaller and duller. Distinguished from the crow by the tract of bare whitish skin at the base of the bill (Figs. 1, 2). The young rook, up to its second autumn moult, resembles the

crow in having the base of the bill feathered (Fig. 3; see also p. 31), but differs from it, firstly, in the shape of the bill, that of the crow being stouter and more decurved (Figs. 1, 3); secondly, in the general appearance of its plumage, which hangs from it loosely, especially on the flanks, whereas that of the crow is closer fitting (Pls. 2, 3); thirdly, in having the back of the tongue square or trapezoidal— —instead of, as in the case of the crow, round (G. Rörig); fourthly, in having the neck feathers

soft as compared to the harder and conspicuously lanceolated corresponding feathers of the crow; fifthly, in having the first primary as long, or longer,

than the ninth, the crow having it shorter. The violet gloss, moreover, is much less pronounced or absent, especially from the neck and head of the latter. The statement that the two species can, further, be distinguished by the colour of the bases of the feathers is incorrect; in both these are

Fig. 2.—ROOK.
(Natural size.)

Fig. 3.—YOUNG ROOK.
(Natural size.)

normally grey. [F. B. K.]

2. Distribution.—It is found from South Sweden and the Kola Peninsula to South France, North Italy, and the Danube Valley. In Asia it is replaced by an allied race. It is generally distributed and resident in suitable localities throughout the British Isles, and now established on some of the Outer Hebrides and the Orkneys. [F. C. R. J.]

3. Migration.—Its migrations to and from our shores, described in detail by Mr. Eagle Clarke in the *Report of the British Association*, 1903, p. 298, are briefly as follows:—(1) Large flocks from Central Europe arrive between mid-September and mid-November on our east coast from the Humber southward,

spreading thence inland in all directions. They are seen returning to their continental breeding-grounds from early in February to mid-April; (2) flocks, not so large, coming from Scandinavia, arrive between mid-October and mid-November in the Orkneys and Shetlands, thence spreading south as far as the English northern counties. The return migration takes place in March and April, the birds quitting our shores chiefly by way of the Orkneys and Shetlands; (3) between the end of February and early April flocks from the Continent arrive on our south-east coast, flying in a north and north-west direction. In September and October there is an emigration presumably of the same birds, flying in the direction of France and Belgium; (4) there is an emigration from Great Britain to Ireland in the autumn, with a return to the former in the spring. Hence it will be seen that the rook, besides being a resident species, is both a winter and summer visitor. In addition to the above migrations, erratic westerly movements over the Atlantic have been observed. In October 1893 some thousands, accompanied by a few daws, were seen going west over the Scilly Isles. Later, flocks, probably the same, were seen arriving in a state of exhaustion on the west coasts of Scotland and Ireland, and several were washed ashore dead. [F. B. K.]

4. Nest and Eggs.—Nesting place: normally in colonies among tree-tops, exceptionally between the pots on chimney-stacks, on church spires, rarely in bushes and hedges. Nest: sticks, dry and fresh, strengthened with earth and lined with moss, leaves, roots, grass, wool, hair. (Pl. I.) Both sexes share in its construction. The eggs, usually 3-5, sometimes 6, and rarely 7 in number, are greenish with olive-brown markings, but vary considerably in appearance, and are occasionally found with a bluish ground, while red eggs have been several times recorded from the Continent. (Pl. A.) Average size of 100 eggs, 1.6×1.06 in. [40.7×27 mm.]. Laying begins usually in late March or April. Both sexes incubate. Period of incubation, 14-21 days. In an incubator, 17-18 days (W. Evans, *Ibis*, 1891). The young remain in the nest 4-5 weeks (S. E. Brock, A. Taylor). One brood, although attempts are occasionally made to breed in the autumn, but generally without success. [F. C. R. J.—F. B. K.]

5. Food.—Chiefly worms, insects, slugs, and in the autumn acorns, seeds of cones, and similar fruit; occasionally grain. In cold weather or drought they become practically omnivorous, their dietary being like that of the preceding species, except that they appear to be, as a rule, less addicted to carrion. The young are fed by both parents, chiefly on worms and insects. [F. B. K.]

6. Song Period.—See p. 39.

JACKDAW [*Corvus monedula*, Linnæus. Kae, caw-daw, cadder, chough. French, *choucas*; German, *Dohle* ou *Turmkrähe*; Italian, *Taccola*].

1. **Description.**—Black with blue-green or purple gloss. Length 14 in. [355 mm.]. (Pl. 4.) Distinguished from the preceding species, with which it often consorts, by its smaller size, quicker wing beats, blue-white iris, and the grey on its nape, neck, and ear-coverts. The female has less grey. The young are duller than the adults, and their irides are brown, becoming entirely grey only after the second autumn moult. Several skins of young are brown on the hood and underparts. [F. B. K.]

2. **Distribution.**—Its range extends over the greater part of Europe and temperate Asia, east to Japan and south to Algeria. Three races of this bird are found in Europe—the eastern form (which has a distinct white collar) being chiefly confined to South Russia, the Balkan Peninsula, and parts of Austro-Hungary; while the Scandinavian race is found in South Sweden; and the common western race not only inhabits the British Isles, but is found over the rest of the Continent, and locally in North-west Africa. [F. C. R. J.]

3. **Migration.**—It is to be found as a resident species in nearly every part of the British Isles. Its migrations are identical with those of the rook, which it often accompanies, even on its erratic excursions over the Atlantic. [F. B. K.]

4. **Nest and Eggs.**—Nesting place: any convenient hole, usually in buildings, rocks, trees, also in rabbit warrens. It occasionally builds both open and domed nests in the branches of trees. Nest: varying in size according to the nesting place, built of sticks, lined with wool, fur, dry grass, and other soft material. (Pl. II.) Both sexes share in its construction. The eggs, usually 4-6, occasionally 7, in number, are pale greenish blue, spotted and blotched with brownish black and ash-greys. Some eggs are finely speckled, while others show bold blotches. (Pl. A.) Average size of 50 British eggs, $1.39 \times .99$ in. [35.47×25.32 mm.]. Laying begins in the latter part of April. Both sexes incubate. Period of incubation, 17-20 days. The young remain in the nest 4-5 weeks (A. Taylor, *in litt.*). One brood. [F. C. R. J.—F. B. K.]

5. **Food.**—Practically the same as the rook. The daw is particularly fond of that destructive grub, the leather-jacket. It also resembles the other Corvidæ in its taste for eggs and young birds (*Field*, 1905, January-June, pp. 905, 947). The young are fed by both parents, mainly on worms and insects. [F. B. K.]

6. **Song Period.**—See p. 47.

MAGPIE [*Pica pica* (L.); *P. rustica* (Scop.). Mag, meggit, pyet, pyat, pyanet, pyot, nan-pie, longtailed-nan, haggister, egglift. French, *pie*; German, *Elster*; Italian, *gazza*].

1. **Description.**—Easily recognised by its black and white plumage and long wedge-shaped tail. The black is glossed with blue, purple, and green. Length 18 in. [456·8 mm.]. (Pl. 5.) Female smaller. The young much duller. [F. B. K.]

2. **Distribution and Migration.**—As a species it is found not only throughout Europe, but also in North-west Africa, the temperate parts of Asia to Japan and western N. America. The typical race is generally distributed over the Continent of Europe, but the Spanish birds belong to a local race, and a third form inhabits North-west Africa; while it is entirely absent from Sardinia and Corsica. It is very generally distributed in all wooded districts of the British Isles except where it has been exterminated by game preservers, although it was unknown in Ireland previous to 1676, and is naturally scarce in the barren districts of North Scotland. [F. C. R. J.]

3. **Nest and Eggs.**—Nests: generally high up in a tree, but also not uncommonly in hedges and thorny bushes, while in Norway and Jutland it is occasionally found under the eaves of houses and even on the ground. The nest is very conspicuous in the spring, built of sticks and earth, lined with fine roots, and occasionally with hair, and generally with a dome of thorny sticks. (Pl. II.) Both sexes share in its construction, but, according to Mr. F. C. R. Jourdain, the cock confines himself to carrying material. The eggs, 5-8, and sometimes 9-10, in number, are greenish blue to greenish yellow and buff speckled, with various shades of greyish brown. (Pl. A.) Average size of 100 eggs, 1·29 × ·9 in. [32·9 × 23 mm.]. Laying usually begins in April, sometimes earlier. Both sexes incubate. Period of incubation 18 days in an incubator (W. Evans, *Ibis*, 1891). The young remain in the nest 26-30 days (Xavier Raspail, *Ornis*, 1902-3; S. E. Brock, *in litt.*). One brood. [F. C. R. J.—F. B. K.]

4. **Food.**—Like its congeners, practically omnivorous. The young are fed by both parents on insects, worms, small rodents, young birds, etc. [F. B. K.]

5. **Song Period.**—See p. 56.

JAY [*Garrulus glandarius* (Linnæus). Jay-pyat, blue-wing. French, *geai*; German, *Eichelhäher*.]

1. **Description.**—Distinguished by the reddish-fawn back, conspicuous white rump, and the patch of alternating black, white, and blue on the wing. Length

Photo by F. E. Daniel

Crow's Nest

Photo by F. E. Daniel

Jackdaw's Nest

Photo by F. E. Daniel

Magpie's Nest

Photo by Wm. Farren

Magpie's Nest

TO YOU
ATTENDING

14 in. [356 mm.]. (Pl. 6.) The female is duller, the young still more so. The latter have the irides brown instead of blue, and the feathers on the crown and forehead spotted instead of striped.

2. **Distribution.**—The jay is a species subject to considerable local variation, and our British birds (*G. glandarius rufitergum*, Ht.) differ slightly from the ordinary continental form, while other local races are found in South Spain, Sardinia and Corsica, North-west Africa, Syria, Asia Minor, Cyprus, the shores of the Caspian, etc. It holds its own in spite of game-preserving in England and Wales, but is very local in Ireland, being confined to Leinster and part of Munster, while in Scotland it is of very rare occurrence north of the Grampians. [F. C. R. J.]

3. **Migration.**—It is said that immigrants from the Continent arrive on our east coast occasionally in the autumn. [F. C. R. J.]

4. **Nest and Eggs.**—Nesting place: the fork of a bush or tree, usually from 10-20 feet above the ground, but sometimes 60 feet or even more. Nest: twigs and stems, very neatly lined with an interlaced mass of fine roots, more rarely dry grasses or horse-hair. (Pl. 6.) Both sexes share in its construction (Bailly, *Ornith. de la Savoie*). The eggs, 4-6, sometimes 7, in number, are a pale brownish or greyish green, closely speckled all over with shades of olive-green, and often marked with black hair-streaks at the big end. Some varieties tend to pinkish colouring, while others show a distinctly blue ground. (Pl. A.) Average size of 100 British eggs, 1.25 × .89 in. [31.73 × 22.85 mm.]. Laying begins in April-May. Both sexes incubate. Period of incubation about 16 days. One brood. [F. C. R. J.—F. B. K.]

5. **Food.**—As the magpie. To its love for acorns, chestnuts, and the like, the species owes the name *glandarius*. Both parents feed the young (Bailly, *op. cit.*).

6. **Song Period.**—See p. 57.

CHOUGH [*Pyrrhócorax pyrrhocorax* (Linnæus); *P. gráculus* (L.). Red-legged-crow or daw, Cornish-daw or crow, cliff-daw, chauk-daw, Kiligrew-crow. French, *crave*; German, *Steinkrähé*].

1. **Description.**—Black with steel-blue, violet, and green reflections. Easily distinguished from its congeners by its red legs and bill, the latter being curved. Length 16 in. [406 mm.]. (Pl. 7.) Female smaller and less brilliant. The young have the beak at first short and straight. It begins to curve at the end of the first fortnight (*Field*, 1907, June, p. 870, J. Walpole Bond). Both beak and legs pass through various stages of yellow and red, and do not reach the adult colour till after the first autumn moult. [F. B. K.]

2. Distribution.—On the Continent it is very local, but is found in mountain ranges such as the Alps, Pyrenees, and the Spanish Sierras, as well as on the rocky coasts: it is chiefly confined to the south, and does not occur anywhere north of the Baltic. Outside Europe it is found in the Canaries, in the mountain ranges of Asia from Asia Minor to E. Siberia, and in the mountainous regions of Abyssinia. The range of this species in Great Britain is now much more restricted than formerly, and it has practically disappeared from our south coast with the exception of Devon and Cornwall. In Wales, too, it is now scarce, but it breeds in the Isle of Man, and is not uncommon along the west coast of Ireland and some of the islands of the Inner Hebrides. [F. C. R. J.]

3. Migration.—In the British Isles it is practically sedentary, although in Ireland it occasionally assembles in considerable flocks, and stragglers have been met with some distance from their breeding haunts. [F. C. R. J.]

4. Nest and Eggs.—Nesting place: holes or crevices in cliffs, also frequently in fissures or on ledges in caves. Occasionally in ruined buildings, disused limekilns, or mine-shafts. Nest: sticks, stems, roots, lined with wool, hair, fibres, or other fine material. Both sexes share in its construction (Bailly, *Ornith. de la Savoie*; König, quoted in Naumann). The eggs, 3-5, sometimes 6, in number, are sometimes white, sometimes cream colour, more rarely with a rosy bloom, sometimes yellowish or brownish, spotted and speckled with sepia or reddish brown, and underlying lilac spots or blotches. One variety is pure white with a few bold deep brown spots, another has the ground tinged with green (Ussher and Warren, *Birds of Ireland*). (Pl. A.) Average size of 100 British eggs, 1.55×1.09 in. [39.46×27.94 mm.]. Laying usually begins late in April or in May. The hen incubates (Brehm; P. G. Ralfe, *B. of Isle of Man*). Period of incubation 18-20 days (A. Girtanner, *Zool. Garten*, 1877). The young remain in the nest about 30 days (*Field*, 1907, June, p. 870, J. A. Walpole Bond). One brood (A. Girtanner, *op. cit.*; Ussher and Warren, *B. of Ireland*). [F. C. R. J.—F. B. K.]

5. Food.—Practically omnivorous, especially in cold weather. Usual food, insects, crustaceans, molluscs, worms, also berries. The young are fed on insects, spiders, snails, later small rodents, lizards, etc. Both parents share this task. [F. B. K.]

6. Song Period.—See p. 63.

The following are described in the supplementary chapter on "Rare Birds":—

Alpine Chough, *Pyrrhocorax graculus* (L.). (*P. alpinus*.)

Nutcracker, *Nucifraga caryocatactes* (L.).

Plate 1
Ravens
By A. W. Seaby

THE RAVEN

[F. B. KIRKMAN]

Those who for the first time see the raven circling over its native crags, and hear its deep note break the silence of the hills, experience one of those rare emotions that linger in the memory for a life-time. It is not that one is impressed only by the majesty of the bird ; its majesty sinks before that of the eagle. Nor yet by its strength and courage ; its strength is less than that of the larger birds of prey and its courage no greater. But there is in the raven, or rather in our idea of it, a force that imposes itself, a peculiar sagacity, a deep, almost devilish, cunning that accords well with its sable hues, its crafty eye and rugged form. One might fancy it at times half-bird half-demon, and be moved to apostrophise it as did the poet when he sat that night in dread looking upon the ominous figure, perched upon the bust of Pallas, just above his chamber door :—

“ Ghastly, grim and ancient Raven wandering
From the Nightly shore—
Tell me what thy lordly name is on the
Night’s Plutonian shore.”

It is the sagacity of the raven, its craft and love of mischief, that make it so interesting and sometimes so exasperating as a pet. No one has described its life in captivity better than Charles Dickens, who kept two in succession. Of the first, he relates in his Preface to *Barnaby Rudge*, that it so terrified a Newfoundland dog by its preternatural sagacity that it was able, by the mere superiority of its genius, to walk off with the dog’s dinner before its face. Its genius was not, however, proof against the allurements of its appetite. It perished from over-indulgence in the contents of a pot of paint. The second was still more gifted. “The first act of this sage was to administer to the effects of his predecessor,

by disinterring all the cheese and half-pence he had buried in the garden—a work of immense labour and energy, to which he devoted all the energies of his mind. When he had achieved this task, he applied himself to the acquisition of stable language, in which he became such an adept that he would perch outside my window and drive imaginary horses with great skill all day.” This bird succumbed also to his truly ravenous appetite, his end being hastened by the consumption, in splinters, of the greater part of a wooden staircase of six steps and a landing. To these two birds Dickens added a third, the creation of his own rich imagination, the immortal Grip of Barnaby Rudge, the bird that had more wit than its master, that was indeed the master of its master.

It is curious that the raven, though able, as above noted, to mimic the sounds it hears, and possessing a syrinx or voice organ as complex as that of some of the best songsters, is nevertheless without what, in a musical sense, may be called a song. Like the rook, it does occasionally, in its jovial moods, pour forth a continuous succession of varied notes, but these efforts are more remarkable for unconscious humour than musical quality. Owing no doubt to the comparative scarcity and shyness of the species in our country, no British record exists, as far as I am aware, of this attempt at a song. It has, however, been described both by an American and a Swiss naturalist.

The former, Dr. Coues, writing of the abundance of ravens round Fort Whipple in the 'seventies, states that one of the favourite pastimes of the bird, when comfortably replete, was to perch on the top of some pine, and there lift up its voice, the performance usually beginning with a loud and commanding caw. This was intended, presumably, to engage the attention of its public. After a “complacent chuckle” and an introductory soliloquy scarcely audible from below, there came a series of loud notes like the filing of a saw, ending with the inimitable cork-drawing pops for which the species is famous.¹

¹ Baird, Brewer, and Ridgway, *History of North American Birds*, 1874, vol. ii.

The song of the Swiss bird, a captive specimen, lacked the introductory, self-advertising caw of the American, an omission due perhaps to the sobering effect of an indoor sedentary life and not to any national divergence in character. The central features were the same, except that the introductory soliloquy was observed to be accompanied by a vivacious clacking of the mandibles, and that the subsequent outburst of discordant trills ended, not with a volley of corks, but with extinction of the voice, the raven being left with its beak still open, in an attitude of bewildered inquiry.¹

The song described by Dr. Coues was heard in winter, but the same, or something similar, is, according to Brehm, a feature of the raven's courtship, for though pairing for life like other Corvidae, it does not on that account disdain to give expression, each returning spring, to the renewal of its passion. The exact form the courtship takes has received little notice, much more having been devoted to the extermination of the species and the rifling of its nest. No doubt the bird makes good play, like the Crows in general, with the tail and wings, fanning the one and trailing the other, actions that it certainly performs to express a general sense of satisfaction. A pair have also been seen on more than one occasion with their beaks fondly interlocked, pouring stifled grunts and gurglings down each other's throat—soft nothings charged with meaning.

These amenities are not confined to the period of courtship. They occur also when the young are in the nest, at which period the parents have been seen standing face to face, quite motionless, with the tips of their beaks touching. This corvine kiss lasted three to four minutes. On another occasion the male stood facing his mate and jumped up into the air two or three times to the height of three or four feet—a novel method of expressing his affection.²

The great feature of the raven's courtship are the aerial gambols

¹ *Bulletin de la Société ornithologique Suisse*, tome 1, 2^e partie, 1866 (G. Lunel). Since writing the above lines, my attention has been drawn to another description of the raven's song in R. B. Lodge's *Bird Hunting in Wild Europe*, p. 230.

² *British Birds*, Jan. 1, 1910 (F. Heatherley).

by which it seeks to display at once its agility and its charms, the most remarkable being the habit of suddenly closing the wings in flight and rolling round sideways, sometimes with a croak. The turn is either completed, or else arrested half-way, in the latter case the bird shooting for a space through the air with its back downwards. This feat has not a sexual meaning only, for the species is wont to indulge in it at all periods of the year; sometimes apparently in mere playfulness. It also serves certain utilitarian purposes. Gilbert White in his letter of August 7, 1778, to Barrington, notes that, when moving from one place to another, "ravens turn on their backs with a loud croak, and seem to be falling to the ground. When this odd gesture betides them, they are scratching themselves with one foot, and thus lose the centre of gravity." The habit has, however, a further use as a method of defence against foes even more to be feared than the one which caused the birds observed by Gilbert White to lose the centre of gravity. When in the Lake District, I once saw a raven attacked by a pair of hawks into whose nesting area it had trespassed in search of food. The two assailants rose high above the intruder with excited, angry screams, and, one after the other, came down like bolts from the blue to strike into the soft sable back that seemed to offer so easy a target. But the raven paid not the slightest apparent heed to the coming attack until the moment when I looked to see it mercilessly struck down. Then, it suddenly turned on its back and presented a menacing array of claws and beak that caused each hawk to swerve aside without a second's hesitation, and with lightning rapidity, only to rise again and renew the inglorious assault. The black veteran continued for some time to pursue with dignified tranquillity his researches into the natural history of the fellside, interrupting them only to assume, when needed, his sudden and most effectively disconcerting posture of defence.¹

It must not be supposed that the raven is always equally bold in

¹ Miss E. L. Turner informs me that a raven, which she kept in an aviary and which had its wings clipped, used, when attacked by one of its fellow captives, a magpie, to turn over on its back on the ground and grip its assailant with its claws.

its frequent passages of arms with the hawk tribe. Though it has been seen to pursue an eagle, the latter twisting and turning to elude the attack, it has also been known on various occasions to shrink away from the onslaught of the much less formidable peregrine, even to crouching in fear upon the ground when no cover was available. The courage displayed by birds is, in fact, largely a matter of circumstance. The same raven may at one time be a hero and at another a dastard, its attitude depending on whether it has or not some imperative motive for fighting. Even

. . . "the poor wren,
The most diminutive of birds, will fight,
Her young ones in her nest, against the owl."¹

The boldness displayed no doubt also depends upon individual character, a factor that plays a more important part in animal life than is perhaps even yet fully realised, and of which abundant examples will be given in this work. It is well illustrated by the varying tactics of ravens when their nearly fledged young are taken from the nest, some descending upon the spoiler with fierce barks and ruffled plumage, occasionally approaching near enough to strike or nearly strike him with their wings, others being content to keep at a distance more or less great, and to "bellow for revenge," or, as Macgillivray phrases it less poetically, but no doubt more accurately, to "utter a stifled croak." Some even descend to displays of cork-drawing.

The raven has another outlet for its feelings, when its young or eggs are approached, that is worth notice. This is its habit of tearing up the grass and heather, or driving its strong beak into branches and scattering the splinters in its rage or despair. The habit is not peculiar to the species. Much the same is done by other birds, the jay, for instance, and the magpie. Mr. W. H. Hudson has also noted it in the case of the squirrel. As he puts it in his *Hampshire Days*, that is the way the little pot boils over. Throwing things about is, in fact, a form of boiling over that is not confined to birds and beasts.

¹ *Macbeth*, iv. 2.

It is the persecution to which the raven is subjected in most parts of Western Europe, and the difficulty it experiences in rearing a brood at all, that makes the species appear far more solitary in its habits than is really the case when the conditions of its life are normal. If the young escape the rifle and the bird-catcher, they remain with their parents at least for some months, and there can be no doubt that within our shores, in parts where the species still holds its own, the families will frequently unite to form flocks, small or great. They are drawn together by an abundance of food at some given spot, and remain until it is exhausted. For instance, in the Highlands a hare-drive will attract numbers eager to hunt down with beak and talon the wounded animals that have escaped the more tender mercies of the dogs. And a stranded whale will bring them in numbers to the shore.

In other parts of the Northern Hemisphere, the gregarious habit of the species is more marked. During autumn and winter, in the snow-clad wastes of the Arctic Circle, their black bands may be found holding high revel wherever there is a carcass to be devoured or a refuse heap to be searched. The failure of these sources of supply will, it is said, scatter the flock afar, its members then being seen hunting in pairs or small parties. If from these regions of frost—where the cold encircles the sable neck of each bird with a snow-white ring magically made from its humid breath—we pass to the hot tracts of the sun-bleached Sahara, there again we find the raven in flocks, wherever and so long as any spot in the wilderness gives promise of food. In some parts of North America the species is to be seen in thousands. Dr. Coues, already quoted, speaks of incalculable numbers being present throughout the winter months at Fort Whipple, the black shapes dotting the snow in all directions; they even appear to remain more or less gregarious in summer. In the East, Far and Near, and in Russia, not only do they flock in winter, but in many places breed in close proximity, and are even found scavenging in the towns and

villages, sometimes nesting on the church tower. *Autres pays, autres mœurs!*¹

The raven may, therefore, be termed "sub-gregarious," to use an expression of Macgillivray. It does not, like the rook, form permanent societies, but more or less temporary unions, depending both for their size and their duration upon widely varying local conditions.

Though the gregariousness of the raven outside the breeding season is of a fluctuating nature, the species appears to make a regular habit of collecting to roost. In the Shetlands, Dr. Saxby saw as many as eight hundred preparing to pass the night on the rocky ledges of the tiny island of Uyea. We have also a very complete account of a raven roost by a writer in the *Field*.² This was situated on a ridge of rock two thousand feet up the side of a mountain, of which the name is, for good reasons, withheld. The ground about the ridge was strewn with pellets or castings, for the raven, like his congeners and many other species, is in the habit of regurgitating the indigestible portions of his food. The pellets in question were found to consist chiefly of bone, wool, hair, mussel shells, crabs' toes, corn husks, and a few feathers and bones of birds, eloquent testimony to the bird's catholic tastes.

In order to watch the arrival of the ravens, the narrator hid himself one winter afternoon on the mountain side below the roosting ledge. About four o'clock they began to appear, arriving first in single pairs, then in small parties numbering up to eighteen, these being in loose formation and more or less divided into pairs. Judging from the scarcity of the species in the district, many of these arrivals must have travelled distances exceeding twenty miles. They came flying in at various altitudes, those at the higher levels descending a hundred feet or more with swift dizzy rushes into the roost. During

¹ F. Diderich, *Die geographische Verbreitung der echten Raben*, 1889, pp. 68-81; Naumann, *Vögel Mitteleuropas*, iv.; Baird, Brewer, and Ridgway, *History of North American Birds*, 1874, vol. ii.; *Field*, 1906, July-December, p. 1084; *Ibis*, 1859, pp. 291-2, 312 (Tristram); H. L. Saxby, *Birds of Shetland*; Harvie-Brown and Buckley, *Fauna of the Outer Hebrides*, p. 73; E. Booth, *Notes on Birds*, etc.

² *Field*, 1906, January-June, p. 689.

the course of an hour some fifty were seen passing from the quarter under observation, and there may have been as many from the other side. Meanwhile, from the growing congregation on the ridge, there descended through the thickening dusk the strangest of evensongs, a weird, wild medley of many sounds, the barking of dogs, the bleating of goats, the lowing of cows, the becking of grouse calling across the moorland, and now and then the deep belling challenge of the stag. It was to this unique lullaby that the raven folk sang themselves into slumber—a slumber that any night might rudely be broken by the crack of the keeper's gun, for, even here, in this rocky fastness, the bird is not safe from its deadliest foe. Yet, in spite of repeated assaults, the diminished bands, driven by the inexorable force of custom, return, sooner or later, to the old familiar place, made sacred by the blood of generations of their kind.

THE CARRION-CROW AND THE HOODED-CROW

[F. B. KIRKMAN]

The carrion- and the hooded-crow resemble closely the raven in their habits, but they resemble one another still more closely, not only in habits, but also in structure. In fact, the only important difference, from a systematic or classificatory point of view, generally recognised between them is the coloration of the plumage, the crow being black and the hoodie black and grey. This, combined with the fact that, in the regions such as Siberia, Central Europe, and Scotland, where the nesting areas of the two species overlap, they interbreed and produce hybrids, which in turn are fertile, has led some ornithologists to the conclusion that the two forms could not properly be regarded as more than varieties of the same species. But the view that the fertility of hybrids constitutes an absolute criterion of species can no longer be entertained, for it would involve abandoning the present specific distinction between such well-defined forms as the

Plate 2
Cephaelis and Spicata
Hybrids between the two species
(Four figures)
By H. Goodchild

Plate 2

Carrion-Crow and Hooded-Crow

(Upper Figures)

Hybrids between the two Species

(Lower Figures)

By H. Goodchild

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dog and the wolf, the dog and the jackal, the pintail duck and the mallard, and many others, all of which produce fertile hybrids. It is, therefore, left to the personal judgment of the individual systematist to determine the quantity and quality of the distinctive characters that may be allowed in any given case to divide one closely related form from another. As systematists are prone to differ, and as the species in many Genera merge into each other through an unbroken series of transitional forms, it is not surprising that a confusing variety of opinion is the result. The extent to which this may be carried is illustrated by the well-known example given by Haeckel, who showed that there may be 3, 21, 289, or 591 species of calcareous sponges, according to the point of view from which they are regarded.

In the case of the hooded- and carrion-crow, besides the difference in coloration already described, there is a notable difference in the minute structure of the shells of their respective eggs, those of the rook and jackdaw being, in fact, much more alike in this respect.¹

Some writers are of opinion that the two species can further be distinguished by their notes, or some of them, but as the voices of birds vary with the individual, it would require very close observation to establish a distinction which, in any case, cannot be strongly marked. Whether there is any difference between the songs of the two species is difficult to say, for no record of that of the carrion-crow appears to exist, though no doubt the bird has a song, or what may pass for such. The hooded-crow, like the raven, indulges in a continuous succession of varied notes. That the bird is not ashamed of its vocal powers is evident from the fact that the performance usually takes place on the top of some high tree or building, and evidently affords great satisfaction to the performer.

Whether or not the above-mentioned differences give the two

¹ For the structure of the egg-shells of hoodies, crows, and other Corvidæ, see the *Journal für Ornithologie*, 1874, pp. 1-26 (W. von Nathusius). For interesting observations on the hybrids of birds, see J. L. Bonhote's articles in the *Proceedings of the Fourth International Ornithological Congress*, 1905, p. 235, sec. 2, and in the *Proceedings of the Zoological Society*, 1902 and 1905.

forms a right to independent specific rank, is a question which, if we assume the continued absence of a universally recognised criterion, would provide matter for unending debate, there being no possible basis of agreement except submission to personal authority, and this can offer no more than a temporary solution. In this work the usual custom of treating the two forms as distinct species is followed.

In the choice of habitat, within their respective areas, the two crows do not differ. The grey species is seen on the plains of Siberia and also the mountains of Austria, Scandinavia, and Scotland. If the carrion-crow appears more abundant along the central mountain ranges of Europe and Asia, yet in the British Isles it prefers the woods and fields of England to the Highland moors. Both species and their hybrids are, moreover, found together, as for instance in Scotland, the valley of the Elbe, and mid-Siberia. And they are seen alike on woodland and shore, marsh and moor, town and village, wherever, in short, the food they like is to be found—that is almost everywhere, for they are practically omnivorous, and not difficult to please. Like the raven, they are ready to devour anything from a worm to a whale, from a sheep to a slug. All is good that comes their way: rats and reptiles, frogs and crabs, insects and spiders, grain and fruit. They will snatch fish from the water and bones from a backyard. Birds weakened by starvation and cold fall easily their victims. A young hare, or even an old, they will hunt to its death with exulting cries. They will attack the weakly ewe, first stabbing out her eyes and tearing out her tongue, then doing the same to the lamb. Carrion they love, human and other; in all times they have feasted with the kites on the abundance provided to them by the crimes and the heroism of man. Many indeed are the gallows and the stricken fields that have heard the grateful requiems they have croaked.

In the spring, pairs may be seen diligently quartering the country in search of the eggs and young of other birds, even making a systematic search through trees branch by branch. The smaller birds,

chaffinches, thrushes, and the like, suffer especially from these raids, but larger birds, ducks, pheasants, waders, and others do not escape. The robbers have even been known to carry their audacity so far as to enter and despoil the nest of the golden-eagle, in the absence, of course, of its mighty owner. On one occasion a grey crow was ill-advised enough to allow itself to be caught in the act. In spite of all the cunning twists and turns of its hot-winged flight, it was closely pursued and savagely buffeted till it screamed again. One marvels that it escaped with its life.¹

When the crow, black or grey, finds the nest of one of the larger species, such as ducks or herons, its habit is usually to wait not far off in patient silence till the sitting bird goes away for food. It then loses no time in rifling her treasures. In the case of the smaller birds it is not so patient, and does not scruple to drive them off their nest. Once in possession of an egg, it either pecks a large hole in one side and sucks out the contents, or carries it away in its bill. Dr. Saxby, who kept a tame hooded-crow, noted that, finding hen's eggs too large to carry in this way, it broke open the shell, sucked part of the contents, and then grasping one of the edges of the hole between its mandibles, took its booty away to be consumed at leisure in some more retired spot. It is perhaps this method of carrying the larger eggs that has led some observers to believe that crows, gulls, and other predatory birds fly with them "spiked" on the point of the bill, a feat that seems scarcely possible.²

Perhaps the most remarkable feeding habit of crows is that of breaking open shell-fish, crabs, even bones and walnuts, by taking them up into the air and letting them fall to the ground, the birds themselves descending each time so as to reach earth at almost the same moment, a wise precaution if other crows happen to be about. Whether or not this habit, which is common to a fair number of species, including the raven and the rook, has to be acquired by each

¹ R. Gray, *Birds of the West of Scotland*, p. 173.

² Mr. E. Selous informs me, however, that he has seen a moorhen transfix three eggs in succession and walk off with them spiked on the bill.

bird during the course of its individual experience, or is an instinctive act, inborn like the ability of the duckling to swim when it touches water, is unknown, but its effective performance is certainly either a matter of practice or an individual gift. Hoodies have been repeatedly observed to drop a mollusc or bone on soft sandy ground, or on grass. One let a bone drop, time after time, upon the only patch of sandy ground on a long line of rocky coast. It fell at last, seemingly by accident, on a small rock and was broken. On the other hand, these birds have been seen getting mussels in the drains and creeks which intersect the mud-flats of Breydon, in Norfolk, and deliberately carrying them to be dropped on a stone wall. When ice covered the flats, they spared themselves the trouble of going to the wall, having learnt that the ice served the same purpose. In Switzerland, again, Howard Saunders noted crows dropping walnuts on the flat copings of the walls of the vineyards, seldom missing the mark. It is, further, interesting to note that in dealing with shells they do not limit themselves to this method. They have been seen to open fresh-water mussels by violent blows on the ligaments which attach the valves, and it is also stated that they occasionally adopt the simple expedient of hacking the shell open.¹

That our two crows, like the raven, have in a high degree the ability to profit by experience is evident from the marvellous cunning that individual birds display in their conflict with the shepherd, the farmer, the gamekeeper, and others, who hate them for their raids on lambs, young birds and eggs. A concrete example will help us to realise this more fully, and it is provided by an admirable and authoritative account of the proceedings of a pair of carrion-crows in the Frankfort Zoological Garden, written by its Director, Dr. Max Schmidt. These crows made a practice of robbing the eggs of the waterfowl in the Garden, and it was decided to drive them away.

¹ Lilford, *Birds of Northamptonshire*, 1; *Ibis*, 1891, 174 (H. Saunders); R. Gray, *Birds of the West of Scotland*; Saxby, *Birds of Shetland*, 134; *Field*, 1904, ciii. 51; Naumann, *Vögel Mitteleuropas*, iv. 103; Borrer, *Birds of Sussex*; J. B. Bailly, *Ornithologie de la Savoie*, ii. 79.

First their nest, which they built in the Garden, was destroyed. The birds disappeared, but only to build a nest elsewhere and return after a few days' absence. No alternative was left but to shoot them. They had, however, already learnt to know a gun when they saw one. If the Herr Direktor approached them with a stick or an umbrella, they regarded him with tranquil indifference. But however perfect might be the air of total abstraction from corvine affairs that he assumed, or however absorbed he might appear to be in animated discourse with the friends that accompanied him, the first sight of the gun-barrel would send either of the attentive and suspicious birds in hot haste out of range, uttering loud croaks of warning to its mate. The Director then bethought him of an ambush. One morning, before sunrise, he placed himself in the llama-house, near by the spot where the crows were accustomed to alight. In due time one of the birds arrived, but out of range. Its warning croak made clear that it suspected treachery. What could have aroused its suspicions remains a mystery. It was certainly not owing to anything unusual in the behaviour of the llama, for this philosophic beast remained throughout the affair entirely unaffected by the near presence of its official chief. Seeing that the game was up, the Doctor issued from his hiding-place to find, much to his astonishment, one of the crows not only perched within gunshot, but showing no disposition to take flight. He promptly raised his gun, but did no more, for the crow was so placed as to be perfectly protected from shot by an intervening troop of wild sheep. When this obstacle was cleared, the bird made off. The gun was put away. Poisoned eggs were next tried. The crows broke them open, left them untouched, and devoted themselves with all the greater zest to the unpoisoned eggs. Thinking that their sense of smell had enabled the birds to detect the poison, the Director then cut circular holes in scraps of meat and fish, these being small enough for the crows to swallow whole, inserted strychnine, and then plugged the holes with the flesh extracted. The scraps were left lying about with unpoisoned

scraps. The crows took only the latter, to which they did ample justice. Finally an unpoisoned egg was ingeniously fitted as bait to a small trap, which was concealed with grass. One crow forgot its caution so far as to let itself be caught alive by its beak. But its example was not followed. Its successors were, in fact, left in possession of the field, their robberies being kept within such limits as were possible.¹

But crows, whether black or grey, are, like human beings, equal neither in experience nor in the ability to profit by it or dispense with it. Many fall easy victims to poisoned eggs or flesh, others are shot in some countries by the device of setting up a captive or dummy eagle-owl, the hatred of the crows for this enemy of their race being so great that, though not venturing to close quarters, they rage round it regardless of all other danger, even when the gun is already decimating their ranks.

Though undoubtedly pests, it must not be supposed that the hooded- and carrion-crow are wholly harmful. They destroy large numbers of small rodents and also injurious insects, for it is on these and worms that the young are chiefly fed.

Both species begin preparing for their family duties at least a month later than the raven. Not enough is known about the courtship of either to enable us to make a comparison. The fanning of the tail and the drooping wings play, of course, their part, the former being with many species a favourite mode of expressing emotions, whether amorous or other. Various fantastic mid-air evolutions, amorous buffetings, and also combats are indulged in. The latter element in the proceedings does not, of course, invalidate the generally accepted belief that the two species pair for life, for there are each year the young birds and also a number of old bachelors and spinsters willing and even anxious to assume the bonds. That a large number of these have, nevertheless, to remain unmated throughout the breeding season

¹ *Zoologisches Garten*, 1876, 153-9.

is proved by the readiness with which a bird, whose mate has been shot, finds a new one, not only once but repeatedly. A good example is provided by the case of a hooded-crow, whose husband, a carrion-crow, had been shot. She secured another, also of the black species. It was shot. She returned with a third. Also shot. Yet the "dauntless widow returned with another black mate within a few hours," only to lose him in the same way. How many more she might have led to destruction must remain a mystery, for she herself and her young were the next victims.¹

Both the hooded- and carrion-crow, like the raven, are in the habit of breeding in scattered pairs. They may repair their old nest each year, if the winter storms have left it standing; or, they may build a new, usually in the same place, which they are forced to quit only by repeated persecution. Naumann states that it takes a pair of hooded-crows a day to repair, and two or three days to build their home. Both species sometimes show considerable originality in the choice of material. The grey form has been known to build up a nest on a foundation of bones, in one case measuring a yard across and a foot in depth, the chief contributors being ponies and sheep.²

An interesting account of the care of the young hooded-crows in a nest found at Raasay, north of the Isle of Skye, is given by Dr. F. Heatherley in *Country Life*: "I had a unique opportunity of watching the hoodies at home, as during that time (3.10 to 6.30 P.M.) the pair came to the nest and fed the young on an average every ten minutes, sometimes only two or three minutes apart, occasionally both together, and then perhaps a wait of twenty minutes. The young, as a rule, sat quietly; only once did I see any quarrelling in the nest. The most striking thing about them was the brilliant colour of the gape. As soon as one of the old birds came in sight, the quiet nest turned into four croaking crimson tulips. I never saw the old birds carrying any food, although I must have seen the young fed about fifty times; it was always a matter of regurgitation. The

¹ R. Gray, *Birds of the West of Scotland*.

² Saxby, *Birds of Shetland*.

biggest young one, although pushing himself forward, was often deliberately passed over; two were generally fed at each visit. A few days later we came across a collection of twenty empty gulls' and shags' eggs lying near a mossy stream in the vicinity, and the young, after their execution, were found to have remains of beetles and winkles in their gullets." The young and the mother were shot by the keeper, and it was not owing to any feeling of mercy on his part that the male bird escaped the same fate.¹

When their young quit the nest, both species move about in family parties; and, as in the case of the ravens, these families, or, if the young are destroyed in the nest, the pairs, tend to unite in bands which vary in size and permanence according to the conditions of the food supply and the degree of persecution to which they are subjected. But it has been observed that, in some parts at least, the carrion-crow, even when occurring in numbers, is not so gregarious as its grey congener.² Both, however, are less exclusive than the raven, readily mixing with one another, and sometimes, especially the hooded-crow, with the rook and other species. They are also much more migratory, our raven appearing to receive no accession to its ranks from abroad, and to be stationary except for its local movements.

Both species habitually collect from all parts to roost in still larger flocks, and sometimes together, a fact that is taken advantage of by gamekeepers and others interested in their extermination. But they have never been found in our country repairing to their sleeping quarters in the almost incredible numbers recorded in the case of the closely related species of North America, the common-crow. A very interesting account of its roosting habits has been written for the American Department of Agriculture, a summary of which is not out of place here, for it will serve to suggest lines of inquiry in respect to our own crows.³

¹ September 8, 1908.

² A. E. Knox, *Ornithological Rambles in Sussex*, 3rd edition, p. 102.

³ W. H. Barrows and E. A. Schwarz, *The Common Crow (C. americanus)*, Bulletin No. 6 of the U.S.A. Department of Agriculture, pp. 9-25, 1895.

In their largest roosting-places the common-crows may number over two hundred thousand. They continue to arrive for some hours before nightfall, flying in from all quarters, and from distances as great as forty to fifty miles. They do not go directly into the roosting-trees, but, like other species, alight at a certain distance away, generally a few hundred yards, many flying over the roost itself in order to reach the appointed place. Here they may be seen, as one after another the bands come in, descending, sometimes from a thousand feet, like winged bolts let loose from heaven, the headlong swoop being often varied by startling twists and turns as they sport one good comrade with another. They spread in black masses over the woods and fields beneath, a living pall, not only alive, but full of sound, and swept by deafening discords. This happy rout goes on till sunset, when, moved by one impulse, the bands make for the roosting-trees, flying low and silent as if anxious to avoid notice. At break of day the great hosts rise up from their many-acred dormitory, and circling overhead awhile, with noisy salutations, get their bearings and depart in hundreds and in thousands to their distant feeding-grounds.

It is perhaps hardly necessary to add that the gunners easily find their way into these huge roosts and slay without mercy; their victims rising with panic-stricken rushes, screaming with fright and pain, only to settle again near by and be scattered by a new discharge.

One may well ask what is it that makes the crows continue night after night to mass together, and so court their own destruction? The cause, whatever it be, must lie deep-rooted in their natures, for they come again and again to the slaughter. It cannot be desire for extra warmth. A branch or a ledge will only hold a certain number, however much they press together, and enough would be supplied by a single family, to say nothing of the union of families that makes up the flock united in the daily search after food. But the night flock is a combination of day flocks drawn from widely scattered areas.

It may be that the force, potent enough to draw them to the same spot each evening, is an ingrained dread of something other

than man, having its remote origin in times that knew not civilisation, its guns and its gamekeepers, a time when nocturnal enemies of another kind were far more abundant than now, so much so that they forced the Crow tribe to seek in numbers a sense of safety during the dread hours when darkness makes useless their chief defence, the quick eye that sees the foe before it strikes. Such enemies may have been the larger owls, for instance the eagle-owl, which, as already noted, has power, even in effigy, to reduce hoodie and crow to dire extremities of rage and fear.

It is worth noting, in concluding this section, that, as in the case of the raven roost previously described, the ground about the crow roosts is covered with the remains of pellets that the birds have disgorged. These contain undigested matter of all sorts, including enormous quantities of seeds. In the report above quoted, it is estimated that in a roost of 15 acres, nearly 800 million seeds may be scattered, more than enough to plant over 1000 acres thickly. Of course comparatively few grow, but as the digestion of the crow is rapid, taking one to four hours, or even less, the process of seed dispersal is not confined to the roost. The species can, therefore, claim to exercise a considerable influence on the distribution of plants within the area it inhabits.

THE ROOK AND JACKDAW

[F. B. KIRKMAN]

The raven and the crows flock more or less except in the breeding season. We now come to two species that are gregarious throughout the year. The rook's habit of nesting in communities is indeed so familiar that the word "rookery" has been used to describe the breeding-places of other species, such as the penguin and the gannet, whose names lend themselves but indifferently to a suffix. It has also been applied to the close-packed, over-crowded,

Plate 3

Rooks

By G. E. Collins

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stifling habitations of the dregs of human society, a singular abuse of language, for the rook has at least sense enough to realise that plenty of fresh air is essential to the well-being of its race.

Again, unlike their larger congeners, which usually betake themselves in spring to the most inaccessible spots they can find, the jackdaw and the rook prefer to rear their broods in the close neighbourhood of man, the one liking best the ruined castle or the cathedral tower, and the other the stately trees that have stood from time immemorial near by some ancient hall or village spire. Rookeries are not unknown in towns, as Gray's Inn will testify, but no doubt in most of these cases it is not the rooks that have gone to the town, but the town that has come to the rooks.

There is, further, a marked difference between the feeding habits of the two groups. The raven and crows usually look for their food on the wing, tracing irregular circuits through the air, and descending to the ground when something worthy of closer investigation has caught their quick eyes. The rook and the jackdaw, on the other hand, are most often seen diligently walking the ploughed land or the pasture, probing for worms and other delicacies. It is possibly the fact that their favourite food can be found in abundance within an area no larger than a single field that has led them to become so much more gregarious than the other members of the family. Certain it is that when frost or snow seal up the earth, and with it the worms, the rook flocks tend to split up into detachments and disperse. The birds are often to be found perched disconsolate on some post or paling not far from the doors of our kitchens, ready to share the charity dispensed to the smaller birds, and also to waylay and rob them, thus providing a concrete illustration of the meaning of the expressive verb they have added to the English language.

The remaining differences between the two groups are incidental to those mentioned. We may now, therefore, come to closer quarters with the immediate subjects of this section.

For nine months in the year, that is during the whole period outside

the breeding season, rooks and jackdaws may be seen feeding together in the same field, the latter pert, dapper, with the air of frank rogues, spying here and there and everywhere with knowing grey eyes as they move briskly about with what Gilbert White would call a swagger in their walk, characteristics that are in marked contrast with the slower motions and the almost episcopal gravity of the rook. But for all its gravity, there is in the rook a spirit of frivolity that will out, and which displays itself in a variety of ways, from a few absurd sidelong hops taken at random on the spur of the moment, and having no apparent object, public or private, to the sudden assumption of an attitude of truculent defiance towards one of its fellows. On the latter occasions the tail is fanned and cocked, while the bird's head and neck have an aggressive forward inclination that is intended to be, and no doubt is, highly offensive to the party challenged. If the challenge is accepted, there will be one or more bouts, the duellists scuffling on the ground, or rising in the air, pecking at each other, perhaps pausing between the rounds, one facing the other, eye to eye and beak to beak. But no great harm is done, and both will, after a little, desist as if by mutual consent, each going its own way, evidently agreed upon regarding the incident as a temporary aberration, about which the less said the better.

This is not the only form of sporting contest indulged in by rooks. They practise various aerial gambols, which they do not confine to their own species. On more than one occasion, when observing rooks and lapwings at rest in the same field, more or less intermingled, I have seen an individual of each flock playing together in the air, sometimes the rook chasing, sometimes the plover, sometimes each taking for the moment an independent course of its own. The most striking feature of these displays, which lasted only a minute or two, was the contrast between the easy, finished actions of the plover, which it accompanied with excited "pee-witts," and the comparatively awkward efforts of the rook, who laboured in silence, though with evident self-complacency, to assume graces beyond his skill. Finally

he alighted with slow dignity, leaving the plover to make a meteoric headlong dash along the furrows, ending with a sudden lift and a fairy-like descent. There occurred also a general wild chase in which about a dozen rooks, daws, and lapwings took part. In all this there was no sign of animosity, no persistent bullying, no attempt to strike or to buffet, as is for instance the case when, in spring time, the rook ventures into the field where the plover has made or means to make its nest. It was all mere frolic, and when it ceased the birds stood about the ground as they were before, and as if nothing had occurred. That birds, like mammals, indulge in play is well known, but such play between members of different species, though no doubt more common than we suspect, is rare enough to merit passing notice.

Besides these playful encounters, there are, of course, lively disputes arising out of contested claims to worms, beetles, and other delicacies, usually terminated by the disappearance of the disputed object down the throat of one or other of the claimants, there being, of course, after this event, nothing tangible to strive for.

What helps, perhaps, to give to the rook the ecclesiastical air referred to is the white about his head, contrasting with the black of his feathering. The white is caused by the bare skin round the base of the bill, a feature which distinguishes the species from all its congeners. How this peculiarity is to be accounted for is a question that has long interested ornithologists, and deservedly so, because it raises in a concrete form the fundamental problem of the origin of a specific variation. The first explanation which naturally suggested itself was that the absence of feathering round the beak of the "bare-faced crow" was due to its well-known habit of probing the soil in search of worms. But the facts do not favour this view. Observation has not so far conclusively proved that the rook is in the habit of digging its beak into the soil up to its eyes (Fig. 2, p. 5). During drought or hard frost it can hardly dig at all, and has to be content to turn over clods and stones, or find other means of subsistence such as is provided by refuse heaps, by charitable dispensers of bread and crumbs

and scraps, and by small birds or rodents too weak to escape pursuit and capture. Now if the bare skin were due to abrasion by boring, one would expect the feathers to sprout anew when, as during the winter of 1814, instanced by Waterton, the ground was hard frozen and covered with snow for months; but this is not what happens. The strongest objection, however, lies in the fact that, if we except a temporary shedding of the nasal bristles which appears, occasionally at least, to occur at the first autumn moult, the young rook retains intact the facial feathers till its second autumn moult, that is for more than a year after its departure from the nest. This is proved both by the observation of specimens in captivity, and by records and dated skins of immature birds shot in spring, that is after the first autumn moult. It is obvious that if the digging habit is to be taken as the cause of the bare skin, then the young rook would not only now and then, but invariably, show signs of abrasion long before its second moult, unless, of course, we are prepared to assume that it either totally abstains from a diet of worms or is fed by its long-suffering parents for months after it is capable of shifting for itself. A further fact bearing on the question has been supplied me by Dr. E. Hartert, who points out that the Far Eastern form of our rook (*C. frugilegus pastinator*) has the bare area much more limited, the lores and chin being feathered. If the cause is to be found in digging, one asks why it does not produce the same effect in the case of the two sub-species. Or are we to assume that the soil or the worms of the area inhabited by *pastinator* (China, Eastern Siberia, Korea, Japan, Formosa) have throughout just that marked unvarying degree of difference from our own that would account for the very definite divergence in the respective bare faces of the two forms?

On the other side, it has been said that rooks with the beaks so malformed as to prevent them from digging, have been found to retain the feathering on the face after the second moult. But this proves nothing, for both abnormalities may be the effect of the same cause.

Setting aside the abrasion theory as yet unproved, we find our-

selves as far as ever from the true solution. All that can with any certainty be said is that the bare face of the rook, like the blue eye of the jay or the red breast of the robin, marks the advent of maturity. Why the rook should have to be content with a rough unfeathered face instead of a bright blue eye or a ruddy waistcoat is a question that science has still to answer.

If we turn from the bare patch round the base of the beak to the beak itself, we find an instrument that, in comparison with the bludgeon-like bill of the raven and crows, is certainly well adapted for probing the soil (cf. Figs. 1 and 2 in the Classified Notes). In this case we are generally content with the Darwinian view that the modification has been the result of natural selection, a view that does not, of course, explain how the variation arose, but only why it persisted. It did so, presumably, because the rooks that, owing to some cause unknown, happened to be born with a beak somewhat longer than their fellows thereby gained a distinct advantage in the search for food. Being better nourished, and consequently stronger than the shorter-beaked individuals, they had a better chance of surviving in the struggle for existence, and hence of perpetuating in their offspring an advantage secured, it may be observed, by no merit of their own. Perhaps the bare patch has arisen in the same way, though, except as a mark of recognition and maturity, its utility to the species is not apparent.

It is a common opinion that when rooks are feeding in a field they post sentinels. That they frequently take no such precaution, even when there are hedges covering the approach to the field on which the flock has pitched, is a fact that can easily be verified. Further, it is not safe to assume that the birds sometimes seen perched on trees near by where the flock is feeding, are there for the express purpose of keeping watch; they may simply be resting. Their elevated position would, of course, enable them to mark and signal the approach of danger sooner than their fellows on the ground, and thus give them the appearance of being sentinels.

A most interesting piece of evidence bearing on the point is supplied, curiously enough, not by rooks but carrion-crows. A German observer noted that a band of eight of these birds were in the habit of frequenting the edge of a pond, which on three sides was screened by a thick growth of osiers, high enough to conceal the approach of an enemy. Outside the osier belt was a post, and on this one of the crows was seen perched not only once or twice, but many times during a period of several summer weeks. When alarmed it uttered a loud note of warning, and its comrades rose at once and flew off in silence, followed by the sentinel. But even in this case it is not certain that the bird was actually engaged in outpost duty. Much closer observation is required before the sceptical can be convinced. Is it the same bird that stands sentinel each time? If so, why it and not another, and what time does it give to watching and feeding respectively? Or is there division of labour, and, if so, what determines the division?¹

In the short winter days rooks and daws begin to move towards their sleeping quarters long before dusk. Rooks almost always roost in a clump of trees. Records of their sleeping on the ground are rare.² Sometimes our resident birds continue to roost during the winter at the rookery, this term being here used exclusively to mean the nesting trees. Usually they appear to cease making the rookery their dormitory in September, not returning to sleep there till the following spring, and repairing, in the meanwhile, each evening to some neighbouring wood, sometimes a considerable distance away, which may often serve as a common roosting-place for several different flocks. It is instructive to note that this change of sleeping quarters coincides with the date of the general autumnal migrations,

¹ For the account of the crow sentry see the *Zoologisches Garten*, 1904, p. 377 (Dr. Horning). Accounts of flocks of geese putting out sentinels are given both by Mr. St. John, quoted in L. T. Hobhouse's *Mind in Evolution*, p. 272, and by Mr. J. G. Millais, in his *Wildfowler in Scotland*, p. 61. But the difficulty in unreservedly accepting these statements is that they involve not merely a question of fact, but one of interpretation. It is not impossible to give to what one sees a meaning it may not really possess. Much more evidence than is available is needed to carry conviction.

² *Field*, 1886.

and may itself be a modified or limited form of the migratory instinct. The evidence available points, however, to a marked lack of uniformity in the sleeping arrangements of rooks, which leaves any one explanation inadequate.

The same applies to jackdaws. Those, or most of those at Wells Cathedral, remain to roost there throughout the year. At Corfe a certain number leave each evening during the winter, from October on, to sleep in a neighbouring wood, the remainder stopping at the castle all night. The daws of Furness, on the other hand, all roost away from the abbey from September to March, quitting it at dusk with their neighbours the rooks, to return at dawn. In this, and probably in most cases when sleeping away from the nesting-place, daws and rooks go to the same roost.¹

Rooks and daws often travel by easy stages to their sleeping quarters, having developed none of the modern passion for quick transit. A flock has been known to take from two to four hours to do a twenty minutes' journey.²

The daws fly sometimes with the rooks, sometimes in a separate band, which appears generally composed of pairs. It has been asserted that rooks fly in pairs within the flock. But, if so, they are not easy to detect. Tennyson has also told us that there is a

‘many wintered crow
That leads the clanging rookery home.’

Personally I have never noticed that any one rook acts as leader, and the experience of others is the same. It is a matter, however, about which each reader can find ample opportunities of forming his own judgment.

The flocks, on arriving at the common roost, do not go straight into it, but, for some unknown reason, pass over or stop short of it, to collect not far off at some common meeting-place. Here, as in the

¹ This information has been supplied me by the keepers at Corfe Castle and Furness Abbey, and by Mr. Stanley Lewis and Mr. Thos. W. Phillips of Wells.

² *Zoologist*, 1904, pp. 270-6.

case of the American crows already described, they may be seen either resting on the ground or in the trees in noisy multitudes, awaiting the arrival of the later flocks, or else wheeling round in the air, where they "sport and dive in a playful manner, all the while exerting their voices, and making a loud cawing, which being blended and softened by the distance . . ., becomes a confused noise or chiding, or rather a pleasing murmur, very engaging to the imagination, and not unlike the cry of a pack of hounds in hollow, echoing woods, or the rushing of wind in tall trees, or the tumbling of the tide upon a pebbly shore." Rooks, indeed, though boasting no song in a musical sense, have an even wider range of notes than the raven. They have been credited with some thirty to forty different notes.¹

Before sunset, at a given moment, the black hosts, moved by what seems a common impulse, rise, and one after another go forward to the roost. Sometimes they drop into it from a height, "a living storm-cloud discharging its black-winged rain," each separate bird shooting and whizzing down to the trees with occasional tumblings in mid-air. Another time, after circling and eddying a while overhead, with joyful clamour, they will descend sedately, and rise and sink once more; or again, for there is an infinite variety in this evening ritual, they may swoop in without a sound, then, as if panic-stricken by some hideous vision in the deepening shadows, burst out like an embodied thunder-clap, only to swoop in, then out, then in till the spectre has been laid, and they stop. At times a kind of madness seems to grip them. After a tempest of sound, the black rout will hurl itself right in among the trees, shooting between them with miraculous turns and twists, hurtling over and about them, and in and out—a fast, frenzied, rapturous dance, with the pine aisles for ball-room, dimly lighted by the moon, and, it may be, the snow, across which the dusky shapes flash and vanish to the rushing music of the swift strong wings.

¹ Gilbert White, *Selborne*, Letter lix. For a list of the notes of the rook, see E. Selous, *Bird Watching*, p. 299.

Once settled on their perches, the rooks may sometimes be heard lulling themselves to sleep with an evensong quite as unique as that of the raven. And it may be taken for granted that the daw, when present, makes a notable contribution of his own to the general effect it produces, for if his range of utterance is not so wide as that of the rook, his "yacks!" and "kaes!" are penetrating. This singular outpouring of the corvine soul has been thus described by Mr. Edmund Selous, who has listened to it hidden in the roost itself. "Groans, moans, shrieks almost, *yells* among the larches, all mingled and blending—but sinking now. A marvellous medley, a wonderful hoarse harmony! Here are shoutings of triumph, chatterings of joy, deep trills of contentment, hoarse yells of derision, deep guttural indignations, moanings, groanings, tauntings, remonstrances, clicks, squeaks, sobs, cachinnations, and the whole a most musical murmur. Loud, but a murmur, a wild, noisy, clamorous murmur; but sinking now, softening—a lullaby.

‘I never heard
So musical a discord, such sweet thunder.’”¹

It must not be supposed that the shooting and whirling flights above described are peculiar to the roosting hour. Rooks and daws may be seen at any time of the day indulging in various aerial displays, both above their nesting trees and their feeding grounds. Only a few hours before writing these lines, I watched rooks shooting down into a ploughed field, with sudden turns and zig-zags that had all the appearance of a series of upsets and spasmodic recoveries. There was certainly in this particular display nothing either graceful or impressive. Far different was the performance of the well-known daws in Kensington Garden, who were seen, one fine winter's morning, by Mr. W. H. Hudson, "rushing over and among the tall elms in a black train, yelping like a pack of aerial hounds in hot pursuit

¹ *Bird Watching*, chap. xi., which has supplied most of the matter for what is here said about the roosting habits of the rook.

of some invisible quarry." Similes apart, this mad chase differs little from the equally mad dance in the roosting trees.¹

The rising at daybreak of the rooks and their satellite daws is just as noisy and lively, and perhaps more joyous than their going to rest. In the half light, the roost itself seems almost a living thing, with one soul and many tongues, until the departing hosts leave it naked, empty, silent, a skeleton upon the waste.

It appears to be the usual custom of rooks and daws, on leaving their sleeping quarters, to repair each morning to their nesting places, where, after mid-air gymnastics and much animated conversation, they fly off to their feeding grounds, returning again during the course of the day. To the subject of these daily visits we shall have to revert.

Early in the year the visits to the rookery (nesting trees) become more frequent and prolonged; and in February, sometimes earlier, sometimes later, according to the season and the more or less exposed position of the rookery, the birds begin seriously to make their preparations for the nesting season.

The first important business is the courtship. This, being a regular annual event, has not for the rook and the daws, or for birds generally, the novelty it possesses for human individuals. It is regarded as something to be entered upon in the same spirit as any other familiar occupation, such as building a nest, finding food, feeding young, or keeping clean. Birds, in fact, set about their courtship in a strictly methodical manner; they conduct the affair from start to finish in accordance with the recognised rules of the game; they know exactly what has to be done, and how. They have no hesitations, no shyness; they do not get flurried, do not even lose their appetites. On the contrary, they will interrupt the most ardent love-passages in order to adjourn for refreshments.

The particular form taken by the courtship of the rooks is well

¹ *Birds in London*, p. 55.

known. The cock birds, with wings trailing and tail wide-fanned, strut the grass, bowing here and cawing there. Or they bring some succulent morsel to their beloved, and she deigns to accept it with quivering wings and stifled thanks. They will even "attempt sometimes, in the gaiety of their hearts, to sing, but with no great success." So writes Gilbert White of rooks in the breeding season. But the song, such as it is, is perhaps more frequently heard outside the breeding season, uttered by individual birds after their morning breakfast, when sitting perched on some high conspicuous bough. This performance, like the one indulged in by the Fort Whipple ravens (p. 12), appears to be simply a mode of giving audible expression to the agreeable feeling that accompanies the undisturbed digestion of a generous meal. Hence, if Gilbert White is correct in making the song part also of the rooks sexual display, it serves to give expression to two quite distinct emotional states. The same applies to the bowing and tail-fanning which have been observed to accompany the song in every case of which we have a record. The tail display, in fact, is used by the rook as a mode of expression on three different occasions—when chattering to itself in an after-dinner mood, when it challenges a neighbour either in sport or earnest, and when courting. I have also seen birds, in winter, displaying a beautiful black fan, when standing alone and apart from their fellows, for no obvious reason except perhaps that they felt just jolly.

The song itself has been variously described. One writer speaks of it as "a series of little consequential gabblings, punctuated from time to time by a strident caw." Another gives it as "a guttural reproduction of the varied and fluttering song of the starling," its chief feature being "a peculiar deep single whistling note repeated three or four times in succession." The resemblance to the starling's song was heightened by the fluttering of the wings which accompanied the performance. A third observer heard it begin with three loud caws. On this occasion it was accompanied by an absurd motion of

the bird's head from side to side, and on all three occasions by the bowing and tail-fanning already noted.¹

The energy displayed by the male rook when he walks the "primrose path of dalliance" appear more often than not to be regarded by the hen, if she regards it at all, with an eye of long-suffering forbearance. Occasionally, as if suddenly recollecting some important domestic matter, she will even quit her adorer without ceremony in the midst of his courtliest bow. But it is not always thus. At times she also will be filled with the divine fire. The two birds may then be seen standing in loving fashion, beak to beak, or beak in beak, protesting their mutual devotion with equal fervour. If at these inspired moments some other male incautiously ventures too near, he runs the danger of being suddenly pinned to the ground and trounced till he yells again.

But it is a common observation that the courtship of the rook is accompanied by relatively few combats. This may perhaps be explained by the view, generally held, that the species pairs for life, a view which, as already noted in the case of the raven, need in no way conflict with the fact of there being a courtship.

Much of the quarrelling that does take place before building operations have actually begun seems to arise from disputed claims to old nests or sites. On one occasion I saw a pair defending an old nest, a huge pile, against three or four other rooks. From time to time, after an interchange of Homeric abuse, one of these would fall upon the two in the nest, and there would be a confused struggle, ending always in the same way, the aggressor being literally thrown out and driven off. The dispute continued as long as I was present, the whole party occasionally, as if in need of relaxation, quitting the tree for a circular tour, after which they would again settle to the matter in hand. That there should also be disputes about sites is not difficult to believe, if the total pairs in the trees that form the rookery

¹ White, *Selborne*, Letter xliii. (Sept. 9, 1778); J. M. Boraston, *Birds by Land and Sea*, 1905, p. 73; *Annals of Scotch Natural History*, i. p. 136; *Field*, 1903, ci, p. 362.

are in excess of the sites available. This is certainly at times the case. One rookery of two trees is known to have contained thirty-five nests and two hundred birds, another rookery two hundred nests and one thousand birds. But at present there is no evidence to show how many of the non-nesting birds are immature or sterile.¹

The shortage of sites may also account for the attempts occasionally made by individual pairs to build nests in trees outside the main rookery. These attempts are not always successful, the nests being ruthlessly pulled to pieces and their builders savagely attacked and driven away by members of the parent colony. When outlying birds that have been thus attacked do succeed in rearing a brood, it will generally be owing either to their having defended their nest successfully day after day till the aggressors became too busy with their family duties to continue the persecution, or to their deferring nest-building till after the busy season in the main rookery had commenced. But the nests that escape in this way are sometimes, if not always, pulled down at the beginning of the following season. In thus forbidding the foundation of a new colony near the ancestral one, the rooks are perhaps giving collective expression to the same instinct that causes non-gregarious birds to resent so strongly any intrusion by others of their own species into the area in which they have made, or are preparing to make, a home for their young. This explanation renders it, however, still harder to understand what enabled the rooks themselves, in the first place, to overcome this primitive instinct to the extent of submitting to nest, as they do, side by side, sometimes as many as thirty pairs or more in the same tree, when there are other trees available in the immediate vicinity.²

It is usually not till the second week in March that the rooks begin to make ready their nests. If the old nest has been completely destroyed by the winter gales, they have no option but to build anew.

¹ *Irish Naturalist*, 1903, pp. 160-1 (C. B. Moffat); *Field*, 1902, May 4, p. 729; J. A. Sowerby, *Rooks and their Neighbours*, 2nd edit., 1895, p. 25.

² *Irish Naturalist*, 1903, pp. 160-1 (C. B. Moffat); *Zoologist*, 1904, p. 191 (R. H. Rambotham, from whom I have received additional information); *Field*, 1865, xxv. p. 230; 1882, lx. p. 569; 1896, lxxxvii. p. 653.

This occurs most often in rookeries placed in exposed positions or containing trees which, like the sycamore and poplars, offer few secure sites for the nest, owing to the way in which the branches project outward from the trunk. In the case of one rookery, it was noted that after a violent storm most nests were blown out of sycamores, two or three out of beech, and none out of ash. The difference between the two latter may, of course, have been due to the position of the trees.¹ Statistics given in Mr. G. Muirhead's *Birds of Berwickshire* go to show that the trees usually preferred are the ash, elm, beech, and Scots fir, of which the first three provide, in the acute upward forking of the boughs, particularly safe sites. If these or any other trees selected show signs of decay, they are deserted promptly, nests and all. Any tree which the rook thus leaves may safely be regarded as doomed.

When a nest survives the winter, the birds either repair or pull it to pieces, frequently to the last stick, in this case the structure being presumably not worth repair. When little damaged, it may receive additions from year to year, and so become a bulky solid mass of sticks and earth, in which grass, ferns, and even seedling trees may be seen growing, while the recesses in its flanks sometimes provide a nesting place for jackdaws, starlings, or tits. A moment comes, however, when the unwieldy mass is tossed to earth by a hurricane, and the process of growth has to begin over again.²

In the work of construction or reconstruction both sexes participate, but usually one only goes to collect the building material, the other remaining on guard, a very necessary precaution, for rooks, like man himself in primitive society, are unscrupulous thieves, and are sometimes not even deterred by the presence of one or both of the owners from raiding a nest. Hence uproars in the rookery, language, loss of feathers and temper, vengeance, assault, battery, and scattering of sticks.

The foundations of the nest are usually built of dead sticks, those

¹ *Field*, 1867, xxix. p. 298.

² For a long and fairly exhaustive discussion on the nest-building habits of the rook, see the volumes of the *Field* for 1866 and 1867.

of the old nest sometimes sufficing. To these earth and clay are added, the whole being completed and strengthened by fresh twigs, which the birds may be seen snapping off as they swing about in the tree-tops. In the cup formed by this rude structure is a soft bed made of leaves, grass, hair, or similar material, and here the hen lays her bluish-green, thickly blotched eggs. From this moment she is assiduously tended by the cock-bird, who not only sometimes takes her place, but goes afield early and late to find for her all the delicacies of the season, which she receives with the usual grateful gurglings and fluttering wings. But there are degrees of assiduity, and there are husbands and husbands. At times "the suspicious hen, kept waiting longer than usual, seems to scent treachery from afar, and whilst the cock is still winging his way to the rookery, hops from the nest, and awaits his arrival on a neighbouring bough. The cock, who has probably been snatching a surreptitious meal in the fields below, takes in the situation, and alights at a significant distance from the nest, wearing the dejected air of one who has been trying all day to earn bread for his wife and children, but only succeeded in obtaining the price of a pint of beer for himself."

"Caw," exclaims the irate wife, incisively, not caring a scrap for the neighbours. "Where have you been all this time? What have you got? you . . .!" etc., as plainly as words can speak, springing along the branch from which the cock escapes to a higher one with a deprecating air.

"He will not answer such charges," he seems to say; and he has a very valid reason.

"But the lady is not to be put off. 'Caw! caw! caw!'" she cries excitedly, until she is beak to beak with him.

"If the rook has a physiognomy, it probably requires a rook to decipher it; but it would appear that she has learned the signs when she suddenly charges the delinquent's bill, and extracts the loveliest bundle of wireworms that ever gnawed a farmer's crop. . . ."¹

¹ J. M. Boraston, *Birds by Land and Sea*, p. 126.

It is when the hen bird has begun to sit, if not before, that the rooks remain to sleep at the nest instead of returning to the winter roost, but, as is shown by the following interesting record from a rookery in the north, they do not necessarily all make up their minds to remain on one and the same date. On March 9th one pair of birds stayed behind and improved the occasion by pilfering their neighbours' nests. On the 11th two hens stayed on their nests, their mates departing with the rest to the winter roost. On the 17th half the birds remained to roost, the rest departing as usual. On the 20th only six pair departed. On the 22nd all departed as usual, but did not go far. They returned at a great height, and then swooped down into the nesting trees. On the 28th all stopped to pass the night.¹

It is now also that from time to time a tragedy occurs which generally results in the break up of the rookery for the season. This is the arrival of a pair or more of carrion-crows, hoodies, or ravens. These enter the nests, peck open and suck the eggs, the rightful owners, after much turmoil and fighting, deserting sometimes at once, sometimes coming back day after day only to be driven off again, not to return till the following year. In one case about half the birds returned to a rookery ravaged in the previous season by a pair of crows. The latter reappeared, and in one day robbed thirty nests, and drove away the owners. The remaining pairs were able to hatch out their young, as one crow was shot and the other disappeared. Shooting the aggressors is the only remedy, and it is advisable to shoot both, for if one escapes, it is as likely as not to return with a new mate. What is most remarkable in these occurrences is the inability of the rooks to defend their nests. A pair of crows, and still more a pair of ravens, owing to their strong bills, are more than a match for a pair of rooks; but that one or two pairs should force over a hundred pairs of rooks to leave, and successfully oppose their daily attempts to return, is a mystery difficult to explain. That these raids are of fairly frequent occurrence will be evident from the examples referred to in the footnote,

¹ From a record kept in 1908 by Mr. Walter Stewart of Blantyre, N.B.

which also point to the carrion-crow as the chief offender. It may be added that they explain almost every desertion of a rookery about the cause of which we possess unquestionable evidence. They probably explain desertions attributed to other causes, more or less fanciful, such, for instance, as the popular superstition that makes the sudden desertion of the rookery a sure sign of coming calamity to its owner. It is only fair to add that the rooks themselves have been known to mete out to herons the treatment they suffer at the beaks of their own congeners.¹

Crow incursions apart, rooks are very difficult to expel from a rookery, as those know who have tried. One method that is adopted in the Black Forest and parts of Switzerland is sufficiently curious to merit notice. Wisps of long straw, each containing as much as one can grasp in the hand, are hung by hooks to the branches of the nesting trees, and there allowed to swing in the breeze. The device was tried in the Zoological Garden at Frankfurt. The rooks at once left, and did not reappear. Later a single pair built near the Garden. The wisps again entered upon the scene, and the pair, after going and returning twice, took a last long look from a neighbouring tree at the uncanny yellow things that were sometimes so suspiciously still, and at other times so alarmingly and fantastically energetic, uttered a melancholy croak, and vanished for ever.

The busiest time in the rookery comes when the eggs hatch, both parents then straining every nerve to cope with the insatiable appetites of their rapidly growing offspring. It has been stated that at first the actual distribution of the food to the young is done by the mother only. She takes it "from the father, passing it on doubly

¹ I find that in his *Ornithologische Fragmente*, p. 150, Petényi records one case of ravens being driven away by the united efforts of rooks. The following cases of the desertion of rookeries caused by carrion-crows are recorded in the *Field*—they include one by a hooded-crow:—1864, xxiii. 291; 1872, xxxix. 211, 234 (three cases); 1875, xlv. 420, 464 (five cases); 1884, lix. 534, 580, 702 (three cases); 1888, lxxi. 654; 1891, lxxvii. 539, 631, 641 (three cases); 1892, lxxix. 545, 625 (two cases); 1893, lxxxi. 470; 1899, Ap. 8. A case is also cited by W. Ward Fowler in the *Zoologist*, 1896, p. 145. For incursions by ravens see Montagu, *Dictionary of Birds*, and W. Borrer, *Birds of Sussex*, p. 74. For two instances of rooks dislodging herons, see J. A. Harvie-Brown and H. A. Macpherson, *Fauna of the N.-W. Highlands and Skye*, 1904, and F. C. R. Jourdain, *Victoria History of Derby*, vol. i. p. 13.

peptonised to the babies." Later both perform this function, "but it is most extraordinary to notice how the young accept it from the father without any demonstration, sometimes in complete silence, while every time the mother approaches they lift up their voices in a chorus of jubilation." It would be interesting to know whether the peculiar division of labour here described is characteristic of the species and the family.¹

Rooks, like all the other Corvidæ described in this chapter, carry the grubs, worms, and other food they take to their young packed in the pouch formed by the elastic skin beneath the tongue, which then bulges out like a ball. The same receptacle is also used to conceal stolen goods. The captive Swiss raven, the one that suffered so unhappily from failure of the voice when singing, hid in the same manner all sorts of objects, such as keys, money, and even pins and needles, the latter seeming to cause him no inconvenience.²

The young birds, owing perhaps to their impatient desire to greet the coming wireworm, sometimes fall to the ground. There, as a rule, they are left to perish. The mere fact of their disappearance from the nest or its immediate vicinity appears to count for nothing. If the young bird is not where the parents expect it to be, then for them it ceases to exist. This is not true only of rooks. I have myself placed a callow little willow-wren on the ground but an inch or two from the base of its nest, and though it wriggled there uncomfortably and conspicuously, the parent bird passed again and again over its head carrying food to the other nestlings without paying it the least attention. An ever-recurring example of the same strange limitation of the maternal instinct is provided by the indifference of the mother birds of many species to their own offspring when ejected from the nest by the alien infant cuckoo. A robin has been watched brooding the little murderer of her young,

¹ *Country Life*, 1899, May 6 (Ph. Robinson).

² *Bulletin de la Société Ornith. Suisse*, i. 2^e partie, p. 21, 1866 (G. Lunel). See also the *Zoologist*, 1844, p. 633, which gives an example of a jay carrying caterpillars in the pouch preliminary to swallowing them, and Ch. Waterton's *Essays in Natural History*, 1871, pp. 302-4.

Plate 4

Jackdaw Hiding Ring

By A. W. Seaby

while the latter lay slowly dying close by outside the nest with their mother's unseeing eyes fixed steadily upon them.¹

The tragedy in the life of the young rook just described is, however, nothing compared to that greater tragedy which each year fills many a rookery with din, and smoke, and bullets, and strews the ground with lifeless or wounded fledglings. This massacre of the innocents may occasionally be necessary. But to kill, when killing is necessary, is one thing; to make this killing, though necessary, a matter for sport is another. Unhappily primitive instincts die hard even among the cultured.

It is generally in the latter half of May that the young rooks who have survived the massacre are induced to quit the trees, their parents using to effect this end the device of making them fly a certain distance before they are rewarded with a wireworm. When in the fields they are still fed for a time.

Let us now turn to the breeding habits of the jackdaws, which will not detain us long, partly because they have received comparatively little attention, and partly because, so far as observed, they resemble very closely those of the rook. The courtship of the two species appears to be much the same. But, besides fanning its tail, the daw has also been observed to raise the feathers of the crown, at the same time pressing the beak down upon the breast, and so bringing the grey hood into play, a performance which it accompanies with a lively chattering, no doubt intended to gain the attention of its mate.²

The daws also have a song, heard in spring, probably at other times, and described as a sort of little prattle, "*qui n'a rien de désagréable*." Like the rooks, they quarrel much, especially about nesting sites. They build their nests of the same material, and are

¹ The evidence I have from various rookeries goes to show that young rooks that have tumbled from the tree-tops are at least occasionally fed by the parents, but this appears to be only when they are nearly fledged, that is, nearing the stage when the parents are accustomed to feed them away from the nest.

² For these particulars respecting the daws' courtship I am indebted to Mr. Stanley Lewis of Wells.

by no means averse to procuring it at the expense of a neighbour. They are devoted husbands and wives, and devoted parents, both sexes sharing in incubation and in the feeding of the young.¹

They differ, however, from the rooks in preferring to place their nests in holes, whether in the walls of cathedrals, ruined and other buildings, or in cliffs, rabbit-warrens, and the trunks of trees. Like rooks again, they display an occasional liking for chimney-pots; but whereas the former is usually content to place its nest on the stack between the pots, the daw goes one better and builds in the pot itself, being deterred neither by the smoke coming up the flue nor by the fact that if the pot offers no hold for the sticks, they merely drop down into the room below. One pair is known to have used six hundred sticks in trying to fill up one flue, and it was only after three days of this unprofitable exercise, that the birds consented to abandon the undertaking, much to the relief of the occupiers. If a stick gets caught in the flue, the untiring energy of the little builders is finally rewarded, and the eggs are laid on the top of a structure that may measure ten or twelve feet in depth. As the presence, however, of several feet of sticks in a chimney-flue does not promote the original object it was constructed to serve, this form of building enterprise on the part of the daw receives scant encouragement. A usual method of protecting the pots is to wire them, a broad hint that the jackdaws do not always receive in the spirit in which it is intended. Instead of building in the pot, they build over it, on the wire. One owner found an egg laid simply on the bare wire itself. He removed it, and, in order to keep his hands free for the descent, put it in his mouth. An injudicious proceeding, as the event showed. Fortunately the egg had only just been laid.

It has been more than once pointed out as a remarkable fact that the jackdaw should use sticks at all. They can serve no necessary purpose. The correct explanation is perhaps to be found in the hypothesis that, before resorting to holes, the species habitually made

¹ For the notice of the jackdaw's song, see V. Fatio, *Oiseaux de la Suisse*, 1899-1900.

nest in the forks of trees, where a pile of sticks would obviously be of use in providing the structure with a solid foundation. That the change of site was not accompanied by a change in the method and material of construction is easy enough to understand, seeing that there was nothing in the new departure to make this necessary. The practice, therefore, of carrying sticks to the hole has persisted, on the present hypothesis, merely as a harmless survival. It is much more marked, however, in certain individuals of the species than in others. In some cases the sticks are dispensed with, there being nothing but a few twigs, or a little wool, moss, or grass. The absence of the necessity for sticks gives, in fact, free play to individual variations.

In favour of the view that the jackdaw's partiality for holes is of recent date may be urged the fact that the species still does occasionally build nests in trees. Further, if we grant that the normal colour of the eggs of hole-nesters is white, then the fact of the jackdaw's egg being coloured and spotted provides an additional argument.¹

Another practice which the daw appears to inherit from a former state is that of holding by the middle any long stick it carries. The rook does the same thing. No great inconvenience results when, as in the case of the latter species, the object is merely to place the stick in the fork of a branch. But to effect its entrance held crosswise into a small hole is quite another matter, as the daw soon discovers, or rather as he, in a sense, does not discover, for he will zealously repeat the experiment with different sticks, only to end by dropping them to the ground, where they go to swell the barrow-loads already lying at the foot of the wall. It would be very interesting to find out whether any individual birds succeed in overcoming the difficulty, and whether, having, accidentally perhaps, drawn the stick by its end into the hole, they continue to do so on subsequent occasions. When the

¹ For evidence that the jackdaw builds nests in trees, see the *Zoologist*, 1843, p. 185; 1845, p. 823; 1847, p. 1774 (J. Wolley); 1865, p. 9572; 1885, p. 264; 1901, pp. 70 and 154; and the *Field*, 1875, xlv. 515 (several instances); *id.*, 1893, lxxxi. 470; *id.*, 1903, ci. 775 (F. C. Selous and J. G. Cornish), 814; W. H. Hudson, *Birds and Man*, p. 71; *North Staffs Field Club Rep.*, 1901; *Northants Nat. Hist. Soc. Rep.* 1899, p. 174.

sticks have once been dropped they are allowed to lie, though exceptions to this rule are recorded.¹

Here we may revert to the interesting question of the meaning of the daily visits to the rookery made both by rooks and daws during the autumn and winter months. The facts are supplied almost entirely by the former species, and are as follows:—The birds may be seen occupied with their nests, repairing them or merely removing leaves and other material, almost at any time from September onwards, especially on fine days. In September, October, and November they have been frequently seen either completely renovating old nests or building entirely new structures. One example will suffice, taken from volume xxviii. of the *Field*, 1866 (381). In this case five rooks were seen to alight on a tree where there was a nest. One proceeded to pull out some sticks and let them fall, after which he commenced steadily the work of reconstruction, breaking off fresh twigs, and intertwining them as industriously as if the nest had been required for immediate use. Directly the repairs had been commenced, the other rooks appeared determined to dispute the possession, and there was a great clamour and fighting among them. The owner of the nest was joined by its mate, and the aggressors driven off. One of the pair continued to work, the other standing on guard. An instance is also recorded of a new rookery being started in October.

The length to which these building operations are carried appears to depend upon the weather, an inclement day bringing them to a standstill. But that they are undertaken with a definite view to immediate breeding is abundantly proved by records of eggs laid and young hatched in October, November, and even December. The intervention of cold spells no doubt brings most of these matrimonial ventures to an untimely end. Their occurrence, let us add, is by no means limited to rooks. The crow has been observed nesting in October; the robin in November, December, and January; the wren in October, December, January; the song-thrush, mallard, wood-

¹ W. H. Hudson, *Birds and Man*, p. 71.

pigeon, several times in October, November, and December. The same applies more or less to the blue-tit, lark, barn-owl, golden-plover, partridge, pheasant, starling, hedge-sparrow, linnet, pied wag-tail, to confine oneself to the species whose winter nestings are recorded in the indexes of the *Field*. Other, and even more definite indications relating to a number of American species are to be found in the *Auk* (xv. 194; xvi. 286). The whole evidence goes to show conclusively that, given encouraging weather, individuals of many widely distinct species are prepared to start breeding after the autumn moult.¹

In concluding this section, let us note that the rook and the daw, like their congeners, make lively, mischievous, and interesting pets. Anecdotes of their cranks and oddities are numerous. The following must suffice. It concerns a tame rook that passed his life in a poultry yard, where he became the inseparable friend of a cock and two hens. The cock was his chief favourite, and each night he would sleep beside him, trying to nestle under his wing. He took a fraternal interest in the personal appearance of his two hen friends, frequently taking it upon himself to arrange and dress their feathers to his taste, services that did not always give entire satisfaction to the fair recipients. This friendship lasted several years, so long, in fact, that the rook lived to "bury" all his three comrades. He attended the last moments of each in turn with the most assiduous affection, and remained long inconsolable for their loss. When he recovered his spirits, he formed no new friendships. He continued to take an interest in the poultry, but it assumed a form which found favour with no one but himself. It developed into an almost daily race between the bird and the housemaid, whenever, by her long cackling, a hen announced that a fresh egg was to be had for the taking. A taste for eggs is indeed the pet vice of the whole

¹ For instances of the autumn and winter nesting and breeding of rooks, see the *Zoologist*, 1845, p. 868; 1863, p. 8846; 1864, p. 8885; 1871, p. 2440 (E. Newman), p. 2483; 1904, p. 421 (F. C. R. Jourdain); and the *Field*, 1863, xxii. 460; 1864, xxiv. 330, 365; 1865, xxvi. 308; 1866, xxvii. 273, 396; *id.*, xxviii. 381, 453; 1868, xxxii. 388; 1876, xlvi. 504 (crow); 1882, lx. 569, 670; 1884, lxii. 760; 1890, Nov. 698; 1893, Oct. 28, Nov. 18; 1900, Nov. 17.

genus, and the rook has his full share of it. He also shares the family weakness for stealing and hiding any object that interests him, from a pin to a piece of meat. Among his virtues may be counted a truly Britannie love for cold baths, and one captive bird has been known to go regularly to a cabbage patch in order to upset on to his hot back the dew collected in their leaves. Another revelled in snow-baths, rolling his black person gleefully about in the white flakes, and taking it up in his beak to toss it in all directions. A more striking sight still was that observed by Petényi :—forty to sixty rooks all bathing together in a snowfield ; a sight that many an ornithologist would give much to see.¹

MAGPIE AND JAY

[F. B. KIRKMAN]

The raven and its immediate relatives, the crows, rook and daw, though saved from the reproach of plainness by the metallic lustre of their plumage, cannot be described as beautiful birds. But this title may with justice be claimed both by the jay and the magpie, as a glance at the coloured plates will show.

Their beauty however avails them little. They have an unfortunate weakness for eggs and young birds, including those of the pheasant and partridge, which bring them into fatal collision with the gamekeeper. In almost any game-preserve their remains may be found, with those of crows, stoats, and other offenders, nailed to the keeper's gibbet. The jay has, moreover, often to pay the price of its life for the bright blue feathers it bears on its wings, as they are sought after by the angler to dress his hook. Both birds are accused of ravages in the garden. The mischief they inflict has indeed blinded us to the benefits they confer on the agriculturist by destroying enormous quantities of small vermin and noxious insects. Their services should at least preserve them from wholesale and systematic slaughter.

¹ *Ornithologische Fragmente.*

Plate 5

Magpie Inquisitive

By G. E. Collins

Both species, though suffering persecution at the hand of the gamekeeper, are at least indebted to him for making equal havoc in the ranks of their enemies, the hawks, from whom they find it no easy matter to escape, when pounced upon away from cover, owing to their comparatively weak powers of flight. Naumann, supported by Brehm, goes so far as to say that the jays' fear of hawks accounts for the hesitation they show in quitting cover, for their habit of flying across open ground either alone, or, one after the other, at intervals, and also for the alacrity with which they will drop into any bush that presents itself in their course. It is certainly true that they may frequently be seen flying at intervals in ones or twos, and they migrate in the same manner, but it is not clear how this particular formation is of help to them. Perhaps it is merely due to the relative timidity of the individual birds, some plucking up courage to make a start while the others are still hesitating.

It is generally believed that the magpie and jay, like the other Corvidæ, pair for life, this belief finding support in the fact that the species are frequently seen in couples throughout the year, even when in flocks. How far they resemble their congeners in the nature of the sexual displays they indulge in does not appear to be known.¹ This is all the more unfortunate, as they present at least one very interesting feature, the so-called spring assemblies. These are alluded to by Darwin in his *Descent of Man*. Writing of the magpies in Delamere Forest, he states that early in the spring at particular spots they have been seen in flocks "chattering, sometimes fighting, bustling and flying about the trees," and that they left these meetings paired for the season. Waterton and others have noted similar noisy gatherings in the case of the jays. These, according to Mr. W. H. Hudson, are to be witnessed on fine days in March and April in any woods where the birds are common and not shy. There "they scream in concert while madly pursuing one another over the

¹ Since this chapter was written, an interesting note on the nuptial displays and ceremonies of the magpie appeared in *British Birds*, iii. 10, p. 334 (F. J. Stubbs). The birds are described as erecting the head-feathers, fanning the gorgeous tail, and puffing out the white feathers on the flanks and shoulders, thus displaying their attractions to the best advantage.

tall trees." When settled on the trees they display their graces, emitting an extraordinary medley of noises. "Some of them are perpetually moving, jumping, and flitting from branch to branch, and springing into the air to wheel round or pass over the tree, all intent on showing off their various colours—vinaceous brown, sky blue, velvet black, and glistening white—to the best advantage." Mr. Hudson does not appear to attach any nuptial character to this performance. But that it has such is more than probable, judging from the evidence supplied by others, and in particular by M. Xavier Raspail in his description of what he calls the second marriage of both jays and magpies.¹

M. Raspail had occasion to shoot one of a pair of jays found guilty of robbing small birds' nests. The survivor departed, but on the morrow eight jays appeared, and spent the time either in a tree uttering a low warbling or bubbling note, "un gazouillement très doux," or else flying about together. Next morning a couple were busy building a fresh nest, erected, not like the first, on the outskirts of the estate, but well within its boundaries, much to the owner's disgust. Here we have a distinctly nuptial gathering, differing from the one described by Mr. Hudson merely in being much less noisy and demonstrative, a difference easily explained by the well-known fact that in the breeding season the jay is wont not only to exercise greater caution than usual, but also to modify its startling screeches into notes of less obtrusive fervour and a much lower key.

Still more striking are the examples given by the same writer of the second marriages of magpies. He shot one of a pair of these birds which was engaged in building a nest in his park. Next morning a band of more than twenty made their appearance and spent the whole morning in playing and in chasing each other through the trees, with an accompaniment of "manifestations phonétiques des moins harmonieuses." In the afternoon they disappeared. Next

¹ Ch. Darwin, *Descent of Man*, Part II. p. 113; Ch. Waterton, *Essays in Natural History*, edit. N. Moore, 1871; H. Seebohm, *British Birds*, i. 569; A. C. Smith, *Birds of Wiltshire*, 1887; W. H. Hudson, *Birds and Man*, p. 232; X. Raspail, *Bulletin de la Société Zoologique de France*, xxvi. 104.

day two magpies were observed completing the nest begun by the original pair. The widow (or widower) had, it appears, contracted a new union without loss of time, and "all the magpies of the district had been present to celebrate the occasion." This was in 1888. Some years later M. Raspail repeated the experiment, shooting the male. The results were exactly similar. The same thing occurred a third time, but in a different and more wooded district. In this case the participants were more numerous, and their proceeding very much more discordant.

These observations present several points of interest. In the first place, what part do the birds paired for life play in the first or earlier marriage ceremonies? Are they, as M. Raspail appears to think, present at the second, moved thereto by a very human-like interest in match-making. Or were the birds he saw all suitors? And how were they notified in so short a time that a widow (or widower) was to be won? Did the latter exercise deliberate choice? If so, how did she (or he) make the same manifest, and how did the rejected suitors accept their fate?

Many other instances of the survivor of a pair remating are on record, but not under circumstances similar to those above described. Six hen magpies have been shot in succession, each having sat on the same eggs. Darwin cites a similar case in which no less than seven were shot, but all to no purpose, for the last pair reared their young. The remating of a hen hooded-crow has already been described (p. 25). One of a pair of carrion-crows was killed, and the next day three were seen feeding the young. Examples might be multiplied. A number will be found in the *Descent of Man*, relating to several species. The most remarkable of these is given of starlings. Not less than thirty-five were shot one after another at the same nest, both males and females. Nevertheless a brood was reared.¹

¹ For the remating of the magpie see Darwin, *op. cit.*; W. Macgillivray, *British Birds*, 1; R. Gray, *Birds of the West of Scotland*. For the jay: Darwin, *op. cit.* The raven: Naumann, *Vögel Mitteleuropas*, edit. Hennicke, 1897-1905, iv. 91 (hen shot). The carrion-crow: Yarrell, *British Birds*, edit. Newton, vol. ii., and the *Field*, 1868, xxi. p. 415. The jackdaw: *Field*, 1861, xvii. p. 493.

Darwin explains the existence during the breeding season of so many unpaired birds by (1) the death of one of a pair; (2) the desertion of a barren mate; (3) the assumption that "certain males and females do not succeed during the proper season in exciting each other's love, and consequently do not pair." The first two reasons do not by themselves account for the large number available. To the third, Darwin's own example of the starlings provides an objection. Here, as in the other cases, there was a reserve of both sexes to draw from. As the original pair of starlings were shot, and as the destruction of their successors was not confined to one sex, it is clear that the reserve birds were pairing among themselves. Now if they were prepared to pair after the death of the couple in possession, why not before? Mr. C. B. Moffat, in drawing attention to this objection to Darwin's argument, suggests as an alternative reason for the number of unpaired individuals the habit birds have of parcelling out the ground into nesting areas. If we grant that there are not enough of these to go round, then a number of pairs would have, he argues, to remain unfruitful. Other objections apart, it is obvious that in the case at least of persecuted species like the crow, jay, and magpie, we cannot grant the premise, for here the nesting areas are considerably in excess of the pairs. In the absence of more detailed evidence, it is difficult to suggest any explanation. To begin with, it would be very desirable to know in what proportion of cases the new mates are needed only to help in incubating eggs or feeding young already in the nest, and how often, in such cases, they are immature or sterile birds.¹

It will have been noted that the nuptial ceremonies of jays and magpies are accompanied by "manifestations phonétiques," more or less harmonious. Naumann describes the song of the magpie as a kind of chattering with whistling notes intermixed, and he observes that it is heard in the spring, both when the birds are in pairs and when several males are courting one female. It has also been heard to sing in

¹ C. B. Moffat, *Irish Naturalist*, 1903, p. 158.

captivity. The jay's song is better known, and is said by the same authority to be heard throughout the year. It is made up of a variety of low warblings. More than one observer has noted that it may be interspersed with imitations of the sounds uttered by other animals. The jay is, in fact, a notable mimic, and has been known to imitate with marvellous fidelity the cock, the hen, the owl, the cat, the dog, the horse, and the sharpening of a scythe.¹

The magpie begins nesting operations earlier than the jay, often in February, the latter species waiting usually till April. The magpie's nest merits special notice. It is a huge structure, bristling with thorns and forming a conspicuous object, especially when placed in the top boughs of some tall tree. In this country they are not often seen, owing to the comparative scarcity of the species, but are a familiar sight in many parts of the Continent. Travellers to Paris may mark them at almost regular intervals on either side of the main lines from the north coast of France. It is perhaps the singularly conspicuous plumage of the magpie that has led it to make a roof to its home. It is, further, noteworthy that, like the longtailed-tit, which also builds a domed nest, the magpie is provided with a tail that must be somewhat difficult to accommodate in the limited space available, especially when half a dozen or more young are in the nest.

Magpies' nests without domes are sometimes found. One such was placed in a low thorn bush, but the thorns made it impossible to reach it. Another was seen on the top of a spruce fir, and resembled a crow's nest. It was occupied for several successive seasons till 1904, when it was appropriated by a pair of kestrels. The magpies then built a new nest—with a dome.²

These instances, and others could be added, go to show, further,

¹ C. A. Witchell, in his *Cries and Call-notes of Wild Birds* (p. 63), writes of the magpie as follows:—"The common cry which one hears from the wild bird is a hoarse rapid 'shushu-shushu.' This is given sometimes as a call-note, and sometimes as an alarm. I have also heard the wild birds chattering together with a great variety of tone and emphasis, though in a manner suggestive of amicability." For the Jay see G. Montagu, *A Dictionary of British Birds*, edit. E. Newman, 1881; W. Borrer, *Birds of Sussex*, 1891, p. 155; V. Fatio, *Faune de la Suisse*, ii. p. 735; H. Seebohm, *British Birds*, i. p. 569; Naumann, *Vögel Mitteleuropas*, iv.

² H. E. Forrest, *Fauna of North Wales*, 1907, p. 176.

that the magpie may continue to occupy the same nest, repairing it year after year, or reconstructing it, if very much damaged by the winter storms. But its nesting habits do not appear fixed, or, if they be so, are guided by circumstances of which we are yet ignorant. Mr. Ussher, writing of the magpie in Ireland, states that it builds a new nest each year, either in the same tree or in another, and this seems to be its usual habit elsewhere. In one case a new nest, containing eggs, was found placed on top of two old ones, the latter being occupied by a pair of starlings and three pair of sparrows.¹

Another habit of the species, which is not well understood, is that of commencing more than one nest at a time. This has been ascribed to cunning, the bird thus hoping to deceive its enemies as to position of the real nest. The practice may, however, be due, as in the case of other species, to the choice of an unsuitable site, or to desertion owing to discovery.

Neither jays nor magpies are backward in defence of their young, but here again, no doubt, as in the case of the raven, the boldness displayed will vary from bird to bird. A pair of jays have been known to show their wrath at an intruder who was examining their young by "chattering and by menacing him, now cawing like a rook, then mewing like a cat, and in their extreme agitation actually plucking off leaves, and biting off pieces of dead twigs from neighbouring trees." A magpie has been observed, in captivity, to express its anger in somewhat similar way; it would utter loud barks, "and would jump on the grass, gather a mouthful of daisies and stones, and commence burying them amid continuous notes of displeasure."²

On quitting the nest the parents and young of both species remain together for some weeks. The extent to which they are subsequently gregarious is difficult to ascertain, owing to the paucity and still more to the incompleteness of the evidence. It has been said that both young jays and magpies, when able to shift for themselves, quit

¹ R. J. Ussher and R. Warren, *Birds of Ireland*, 1900, pp. 89-90; F. C. R. Jourdain (*in litt.*).

² W. S. Durban and M. A. Matthew, *Birds of Devonshire*, 1895, p. 87 (jay); *Field*, 1863, xxii. 322 (C. R. Bree on Magpies). Cf. above, p. 15, the account of the raven tearing off twigs, etc.

Plate 6

Jay Alarmed

By G. E. Collins

the place of their birth, and wander, sometimes forming small bands.

Flocks of jays are certainly observed during the winter months, and in some years more frequently than in others, which suggests that some of them may be formed of immigrant birds. That they are also seen in pairs or singly is of course a well-known fact. On a common with which I am familiar, the jays are either singly or in pairs after about October. Of the roosting habits of this species, little or nothing appears to be ascertained.

Magpies are frequently observed in flocks during the winter, and in parts where they are not persecuted these may number from thirty to forty individuals. Single pairs are also seen, both in the British Isles and abroad. They may be accounted for, perhaps, by local scarcity of birds due to persecution. Magpies certainly roost in flocks, often in company with other species. According to a writer in the *Field*, several hundreds were on one occasion found by him roosting near Morlaix in Brittany. He and his gallant companions manifested their interest in the discovery by leaping out of their traps and firing at least fifty shots into the roost, killing sometimes two or three magpies at a shot, the slaughter being rendered easy by the fact that, for all the noise, the birds did not quit the wood. One ventures to hope that no Bretons witnessed this brutal exhibition.¹

In the winter, both jays and magpies are in the habit of hoarding provisions, which is what one would naturally expect, not only from them, but from all the Corvidæ, having regard to the fondness they have been observed to display, when in captivity, for hoarding all sorts of objects, including food. Montagu denied that jays hoard, but the evidence, so far as it goes, is against him. They have been observed hiding grain, acorns, and the like, carrying them either in the gullet or the distensible pouch under the tongue, and regurgitating them into any chink or cavity, or into holes made with the beak in the ground. They will make several such holes, burying one or more objects in

¹ *Field*, 1900, xcv. 579.

each, and then covering them over with leaves or earth. As they not infrequently forget the whereabouts of their hoards, the nuts or grains take root. Thus the jay becomes unwittingly a planter of trees and corn. The same applies to rooks. They are said to be largely responsible for the dispersal of acorns, but it is not clear that this is due to any deliberate intention to hoard, as the birds are in the habit of plucking off the acorns from the trees and carrying them to be eaten on the ground, where they sometimes leave them lying about or half buried. There is, however, some evidence that they do bury fir-cones. The magpie undoubtedly hoards. In the winter hoard of one thrifty bird the following objects were found—nuts, almonds, apples, scraps of bread, bones, fragments of china, bits of coloured cloth, and a thimble.¹

THE CHOUGH

[F. B. KIRKMAN]

The chough is a comparatively rare bird, and becoming rarer, a fact which accounts perhaps for the little that is known of its habits. Like the other Corvidæ, it makes a very interesting pet, and like them again is capable of strong affection. Dr. A. Girtanner, a well-known Swiss ornithologist, relates that a pet chough which he lost and recovered, manifested boundless joy on returning once more to the familiar quarters and hearing the familiar voices. It uttered excited cries as if beside itself, and sprang and danced about the room and before its master in the most extravagant manner. It behaved, indeed, very much as a dog would under similar circumstances.

The same bird was fond of hiding various objects, and had for that purpose a private box of its own, in which it kept a varied

¹ For hoarding by the jay see the *Field*, 1880, lv. 390; J. B. Bailly, *Ornithologie de la Savoie*, ii. p. 125, 1853; V. Fatio, *Faune de la Suisse*, ii.; Naumann, *Vögel Mitteleuropas*, iv. (edit. Hennicke). For the magpie—J. B. Jaubert, etc., *Recherches ornithologiques du midi*, p. 102, 1859; V. Fatio, *op. cit.*; J. B. Bailly, *op. cit.* For the rook—*Field*, 1880, lvi. 843; *id.*, 1903, cii. 803, 927; Clement Reid, *Origin of the British Flora*. For the chough—*Zoologisches Garten*, 1877, p. 146 (A. Girtanner).

Plate 7

Choughs

By A. W. Seaby

assortment of snail-shells, stones, bits of paper or wood, etc., which it greatly cherished. It regarded any attempt to examine the contents of the box as an unpardonable liberty, flying at the offender with loud protests, and emphasising its displeasure with digs from the sharp red beak. Another tame chough has been observed to hide its food, also to rub in the soil, before eating them, the scraps of meat it was given, a proceeding the exact contrary to that of herons, who may be seen taking scraps to the water in order to wash them before swallowing.¹

The chough pairs for life. Little is known of its love displays. The male has, however, been seen to manifest his affection for his mate by softly rubbing the back of her head with the underside of his coral beak. Like the rook, he also makes a point of bringing her succulent morsels, a fresh red worm or a juicy grub, which she receives much in the attitude of a young bird begging for food, her wings trailing and mouth wide open, expectant, vociferous. These two simple acts, the one expressive of the desire to touch the beloved, be close to her, caress her; and the other, the desire to please her with gifts, have their equivalents, be it noted, in the courtships of many other animals, including man himself. Billings, cosseting, hand-clasps, kisses, giving chocolate, worms, bracelets, are after all merely different ways of doing the same thing. They provide that touch of nature which makes the whole world kin.²

Formerly the chough used to make its nest frequently in ruins, both in this country and in Switzerland. In the latter country they have, during the last fifty years, owing, it is said, to the buildings being rendered unsuitable by renovation, left them for the mountain heights. In this country they now rarely breed away from cliffs by the sea, and often return to the same nesting place year after year. They are seldom, if ever, found nesting in colonies; each pair prefers

¹ *Zoologisches Garten*, 1877, pp. 146-164 (A. Girtanner); *Field*, 1907, June (J. Walpole Bond); *Journal für Ornithologie*, 1857, p. 277 (Bolle).

² For the sexual displays of the chough I am indebted to R. J. Ussher and R. Warren, *Birds of Ireland*, 1900, p. 84.

to make its home apart. One tame pair has been known to drive another away from the tower in which it had built, though all four birds had roosted there in amity together during the winter. Nests found by Mr. Ussher and Mr. Warren in Ireland were observed to "occur on an average a mile apart." One pair in one place is said also to be the rule in Switzerland. This habit may account for the comparative rarity of the species, as compared with the Alpine chough and the jackdaw, both of which nest in communities.¹

When the young are fledged they remain with their parents for several weeks, returning to the nest to roost. Where the species is numerous the families gradually unite to form flocks; where scarce, they are seen either in families, in pairs or singly, according to circumstances. In Switzerland the birds flock to make local migrations. And in the mountain regions of Abyssinia, where choughs are plentiful, they have been observed to quit the common roost early in the morning and spread thence to feed in detachments over the neighbouring country, much like starlings or rooks. They do not appear to mix readily with other species, but have been seen with rooks and daws, and sometimes in Switzerland with the Alpine chough. An interesting fact noted by Mr. P. G. Ralfe in the Isle of Man is that individuals of the species are to be seen in flocks in the breeding season. He holds the view that these are birds which have not been able to find nesting sites. If we assume that the young birds of the previous year are mature by the spring, and would not, therefore, be flocking unmated, the explanation has much in its favour, and it finds support in the habit, already noted, that the birds have of breeding apart, and of resenting intrusion into their nesting area by other pairs.²

¹ R. J. Ussher and R. Warren, *op. cit.*; P. G. Ralfe, *Birds of the Isle of Man*, 1906; Gadeau de Kerville, *Faune de la Normandie*, 1890; *Field*, 1882, lx. 441; Naumann, *Vögel Mitteleuropas*, 1897-1905, iv. 52 (quoting Schinz for Switzerland). It quotes (p. 45) the same authority for the gregarious breeding of the Alpine chough: "Sie nisten häufig in Gesellschaften in geringer Entfernung von einander wie die Dohlen."

² P. G. Ralfe, *op. cit.*; *Zoologisches Garten*, 1877, pp. 146-164 (A. Girtanner); R. J. Ussher and R. Warren, *op. cit.*; V. Fatio, *Faune de la Suisse*, ii.; Naumann, *op. cit.* (for quotations from Schinz, König, Heuglin); J. B. Bailly, *Ornithologie de la Savoie*, 1853, ii. 143.

A few words in conclusion on the notes of the chough. Its usual cry is a clear ringing K'chare! Other notes have been syllabled K'chouf! and K'quoue! The nestling's call for food is Kare! Kwaar! or Jaar! The bird, when excited, utters a Kwùk-uk-uk-uk! Like other Corvidæ, it has a kind of song, a chattering warble, not unlike that of the starling.¹ At what seasons it sings is not recorded.

¹ *Zoologist*, 1900, p. 498 (O. V. Aplin); *Field*, 1907, June, p. 870 (J. Walpole Bond on "Choughs in Captivity"); Naumann, *op. cit.*, iv. 51.

THE FINCHES

[ORDER: *Passeriformes*. FAMILY: *Fringillidæ*. SUBFAMILY: *Fringillinæ*]

PRELIMINARY CLASSIFIED NOTES¹

[F. C. R. JOURDAIN. F. B. KIRKMAN. W. P. PYCRAFT. A. L. THOMSON²]

GREENFINCH [*Ligurinus chloris* (Linnæus). Green-linnet, green-chub, green-grosbeak, green-olf, pea-sweep, featherpoke. French, *verdier*; German, *Grünling*].

1. Description.—Recognised by the stout conical bill, the prevailing yellowish green hue of its plumage, and the conspicuous yellow on the outer webs of the primaries and basal parts of the tail feathers. Length $5\frac{1}{2}$ in. [139·5 mm.]. (Pl. 9.) The female differs in having the head and mantle browner, the under parts chiefly olive-grey tinged on the breast with green, and the yellow on the primaries and tail feathers duller. The young are striated with dark brown both on the olive-brown upper parts and the pale yellowish green underparts, while the rump is brown instead of green. Their inner secondaries have broad margins of brown, and the primaries are tipped with greyish white. [W. P. P.]

2. Distribution.—The ordinary European form of this species is found south of Orkney in the British Isles, 65° N. lat. in Scandinavia, and 60° N. lat. in Russia, throughout Europe (except in Portugal, Spain, and the Levant, where it is replaced by two local races), and eastwards to Turkestan. It has been introduced into the United States. It is abundant throughout the British Isles, except in the more barren and elevated districts and the outlying islands; it has, however, recently extended its range to include the Orkneys and some of the Inner Hebrides, but it remains a mere visitor to the Shetlands. [A. L. T.]

3. Migration.—A resident and a migrant species. Large flocks arrive in autumn, mostly by day, on the coast between Kent and the Wash, thence spreading

¹ See the Explanation, p. xvii.

² In the sections *Nest and Eggs*, Mr. Jourdain is responsible for writing the descriptions of the nesting place, nests, and eggs, Mr. Kirkman for the remainder.

Photo by Ch. Reid

Greenfinch on Nest

Photo by E. L. Turner

Young Hawfinch in Nest

Photo by Riley Fortune

Greenfinch Nest

inland and northwards. This immigration is at its height in October. In spring they return to their breeding grounds in Central or Western Europe by the same route, and it is doubtless these emigrants which are recorded in April from light-stations on the part of the coast in question (cf. *Brit. Assoc. Report*, 1896, p. 456; and *B. O. C. Migration Reports*, i. p. 125, ii. p. 178). Movements between Great Britain and Ireland occur at the same season, but there appear to be two routes; an east to west one across the Irish Sea, especially between Anglesey and Co. Dublin, and a north-westerly one across St. George's Channel (cf. *Brit. Assoc. Report*, 1896, p. 460). There is also some evidence of intermigration between England and countries to the south. [A. L. T.]

4. **Nest and Eggs.**—Nesting place: usually in shrubs, trees, and hedges, rarely in creepers, about 4-8 feet as a rule above the ground. Nest: a foundation of twigs, moss, roots, and sometimes wool, neatly lined with fine roots and hair, and occasionally with feathers. (Pl. III.) It is built by the hen, the male, according to Naumann, occasionally helping. The eggs, usually 4-6, rarely 7, in number, are rather sparingly spotted with reddish brown and occasionally a streak at the big end, on a dirty white or pale greenish blue ground, with underlying markings of pale violet or light brown. Some eggs are quite unmarked. (Pl. B.) In character they resemble those of the linnet, but are larger, and 101 eggs average $\cdot 80 \times \cdot 57$ in. [$20\cdot 25 \times 14\cdot 52$ mm.] in size. Laying begins sometimes in April but generally in May. The hen incubates, but the male has been seen to relieve her (Naumann). Period of incubation 13-14 days. The young remain in the nest about two weeks (S. E. Brock *in litt.*). Broods 2-3, as a rule, but Lilford (*Birds of Northamptonshire*) says that 4 occasionally occur. [F. C. R. J.—F. B. K.]

5. **Food.**—Seeds, especially of turnips, radish, mustard, sprouts; also charlock, maize, wheat, berries. The young are fed by both parents on insects and macerated seeds. [F. B. K.]

6. **Song Period.**—From about February to August. [F. B. K.]

HAWFINCH [*Coccothraustes coccothraustes* (L.); *C. vulgaris*, Pall.

Common-, blackthroated-, or haw- grosbeak, cherry-finch, cow-bird, berry-breaker. French, *grosbec*; German, *Kirschkernebeisser*; Italian, *frosone*].

1. **Description.**—Recognised by the peculiar bill-hook shape of the tips of the inner primaries (Fig. 4), the huge beak, the horny pads inside it, the black throat and lores, and the orange and ruddy browns of its plumage. Length 7 in.

[178 mm.]. (Pl. 18.) The female is paler, and easily distinguished even in the fledgling stage from the male by the ash-grey on the outer webs of the secondaries,

Fig. 4.
(Natural size.)

and the distal half of the primaries. The fledgling differs in having the crown and nape sepia-brown, no black on the throat, underparts yellowish white spotted with dark brown, rump tawny. Later the throat becomes bright sulphur yellow with a dusky border, then black, beginning in the centre; crown and nape yellowish brown, the back as in the adult but paler, breast pale tawny brown, remaining in some specimens dusky white with

black tips, giving the appearance of bars. [W. P. P.]

2. Distribution.—Palæarctic: the typical form is somewhat locally distributed in suitable localities throughout the greater part of Europe, but does not reach high latitudes, and is replaced in North-West Africa by a local race. The limits of its breeding range in northern Europe are the St. Petersburg district, the southern part of Sweden, and England. In the last-named it has extended its range to a remarkable extent of late years. 'Eighty years ago or thereabouts, hawfinches were accounted scarce *visitors* to England, and it was only a few years after that they were found to breed here' (Newton, *Irish Naturalist*, 1906, p. 136). In 1899 it had been 'steadily increasing in numbers during the last fifty years,' and was common in the south-eastern parts of England, becoming scarcer towards north and west, and had bred in every English county except Cornwall (H. Saunders, *Manual*, 1899, p. 171). Since then the increase and extension have continued (cf. "Summary of Records," *British Birds*, vol. i. p. 150). In Wales, it bred in Breconshire in 1890, and has since increased and spread westwards (cf. H. E. Forrest, *Fauna N. Wales*, 1907, pp. 139-142; and others), but is still absent from the western seaboard. This rapid spread has taken place in northerly, westerly, and intervening directions from the south-eastern corner of England, and it is now only in the extreme northern and western districts of England and Wales that the hawfinch is uncommon. To Scotland and Ireland, however, it is still for the most part an uncommon winter visitor, although its occurrences are widespread, and it has bred exceptionally in both countries (cf. *Annals of Scottish Natural History*, 1894, p. 195, and 1904, p. 11; and *Irish Naturalist*, 1902, p. 250, and 1903, p. 111). The extension of range is ascribed to the increase of market-gardens providing proper food in abundance at the season when it is most needed (cf. H. E. Howard, *Zool.* 1901, p. 465). [A. L. T.]

3. Migration.—The not infrequent occurrence of the hawfinch in winter

outside its breeding range may be taken as evidence of a certain amount of migratory movement apart from range extension, but exact information is lacking. [A. L. T.]

4. Nest and Eggs.—Nesting place : usually in orchards, isolated hawthorns, or forest trees, but occasionally in hedges. Nest : characteristic—a layer of twigs, with a shallow cup of bents, fibre, roots, lichens, lined with rootlets, hair, dry grass, fibre. (Pl. III.) Whether it is built by both sexes or one has not been recorded. The eggs, usually 4-5, sometimes 6, in number, are handsome and very distinctive. They are boldly streaked and spotted with very dark olive-brown and faint markings of purple-grey on a bluish or greyish green ground. In some varieties this is slate-grey and in others warm buff with brown markings. (Pl. B.) Average size of 100 eggs $\cdot 94 \times \cdot 68$ in. [$23\cdot 8 \times 17\cdot 2$ mm.]. (Pl. B.) Laying begins at the end of April or in May. Incubation is performed chiefly by the female (Naumann). Period of incubation 14 days. One brood. [F. C. B. J.—F. B. K.]

5. Food.—Chiefly the kernels of the hawthorn, cherry, plum, yew ; peas, hornbeam seeds. The young are fed with insects (Naumann). Both sexes share in this duty (Naumann ; Bailly, *Ornith. de la Savoie* ; E. L. Turner). [F. B. K.]

6. Song Period.—February to June (Naumann).

CHAFFINCH [*Fringilla cœlebs*, Linnæus. Called after its familiar note the spink, twink, pink. Other names : sheely, shilfa, shelly, shivvy, skelly, scobbie, scoppie, shell-apple, white-wing, white-linnet, pie-finch, fleck-linnet, copper-finch, buck-finch, bull-spink, beech-finch, boldie, snabby, charbob, weetie, wintie. French, *pinson* ; German, *Buchfink* ; Italian, *fringuello*].

1. Description.—Recognised by the conspicuous broad upper and narrower lower white bars on the wing-coverts, the yellowish green rump, slate blue crown and nape, light chocolate-coloured back, and red (pale burnt-sienna) throat and breast. After the autumn moult the plumage is less vivid. Length 6 in. [152 mm.]. The hen differs in having the crown and nape greyish brown, the back olive-brown, and the throat and breast whitish brown with a tinge of sienna. (Pl. 14.) The young are like the hen, but have conspicuous yellow-green margins to the outer webs of the secondaries. [W. P. P.]

2. Distribution.—Palæarctic: the typical form breeding throughout most of Europe and much of Western Asia, up to the Arctic Circle, and beyond this, in Scandinavia, nearly to the North Cape. A number of local races are, however, resident in the various North-West African states, in Madeira, in the Canaries, and

in the Azores. The chaffinch is abundant throughout Great Britain, and is found even on the smaller islands, including the Inner Hebrides, Orkneys, and exceptionally the Shetlands. It is considered to be the commonest land-bird in Ireland. [A. L. T.]

3. Migration.—It is both resident and migrant. Its migrations appear to be practically identical with those of the greenfinch already described, but the southward emigration in autumn, and the corresponding spring immigration on the south coast of England are more marked (*vide antea*, p. 64; and cf. *Brit. Assoc. Report*, 1896, pp. 456, 460, and 464; W. Eagle Clarke, *Ibis*, 1902, pp. 252, 256, and 266, and 1904, pp. 119 and 138; and *B. O. C. Migration Reports*, i. p. 125, ii. p. 178, and iii. pp. 181 and 192). [A. L. T.]

4. Nest and Eggs.—Nesting place: hedges, bushes, or trees, generally from 4-15 feet high. Nest: very neatly built of felted moss, wool, grasses, etc., decorated externally with lichens and lined with hair and feathers. (Pl. 14.) It is constructed by the hen, though the cock is said to help in bringing material. The eggs, usually 4-6 in number, are pale greenish stone colour, with a few "brand-spots" and streaks of dark purple-brown. Some eggs have only pale cloudings of light brown, while others have a bright blue ground, sometimes unmarked, or with very dark markings. Average size of 100 eggs, $\cdot 76 \times \cdot 57$ in. [$19\cdot 3 \times 14\cdot 6$ mm.]. (Pl. B.) Laying begins in mid-April. The hen usually incubates, but is habitually relieved each day by the cock according to Naumann, occasionally so according to others (T. H. Nelson, *B. of Yorkshire, etc.*; A. Taylor, *in litt.*). Period of incubation 11-14 days. In an incubator 11-12 days (W. Evans, *Ibis*, 1891). The young remain in the nest about two weeks (S. E. Brock, *in litt.*). Broods 1-2. [F. C. R. J.—F. B. K.]

5. Food.—Seeds, berries, buds, kernels of fruit, insects and their eggs. The young are fed on insects, possibly seeds, by both parents. [F. B. K.]

6. Song Period.—From January to July, and on fine days in autumn and winter. [F. B. K.]

BRAMBLING [*Fringilla montifringilla*, Linnæus. Bramble-finch, mountain-finch, furze-chirper, cock-o'-the-north, oversea-lenny, French-linnet. French, *pinson des montagnes*, *pinson des Ardennes*; German, *Bergfink*].

1. Description.—Distinguished by its chestnut throat and breast, white rump conspicuous in flight, and the blue back feathers of the head and mantle, which in winter have ruddy brown edgings. Length 6 in. [152 mm.]. Young males in winter are paler. The female is brownish grey mottled with

brownish on the head and mantle, and is generally duller in coloration. (Pl. 17.) [W. P. P.]

2-3. Distribution and Migration.—Its breeding range in Europe is confined to Scandinavia north of about 60° (except in the extreme north), and North Russia from the Kola Peninsula south to St. Petersburg and lat. 62° in the Urals. It visits nearly every part of Europe on migration, although rare in the extreme south. It is of accidental occurrence in the British Isles in summer, but as a winter visitor, chiefly from October to March, it is found abundantly in the region between the Forth and the Humber, and also in fair numbers both to the north and to the south of this area; but on the western side and in Ireland it is rarer, although occasionally appearing in large numbers. Most of the birds probably arrive on the east coast between the Forth and the Humber, but a certain number pass through Shetland and the north-eastern districts of Scotland. Its relative abundance is proportional to the severity of the season. It arrives in flocks. [F. C. R. J.—A. L. T.]

4. Nest and Eggs.—Is not a British breeding species. See the previous note.

5. Food.—Chiefly beech-mast, various seeds, insects.

6. Song Period.—Only sings in the breeding season (Collett).

GOLDFINCH [*Carduelis carduelis* (Linnæus); *C. elegans*, Stephens. Goldie, gold-spink, red-cap, red-linnet, thistle-finch, captain, speckled-dick, proud-tailor, Sweet-William, Peckel-Dick, Jack-Nicker, King Harry. The young are known as greypates or branchers. French, *chardonneret*; German, *Distelzeisig*, or, from its call-note, *Stieglitz*; Italian, *cardellino*].

1. Description.—Easily identified by the crimson, white, and black of the head, and the yellow bar on the wing. Length 5 in. [126·5 mm.]. (Pl. 15.) The hen (upper figure in Pl. 15) resembles the cock, but there is less red on the face, and the black of the wings is duller, with greyish brown on the minor coverts. The young may be distinguished by the absence of the red, white, and black of the head and the striated back and breast. Abnormal varieties of the goldfinch, with a white throat, are called “cheverels.” [W. P. P.]

2. Distribution.—This species is divided into many slightly differing local races. The British form, *C. carduelis britannica* (Hartert), is practically confined to England, Wales, and Ireland, while the common continental race inhabits the rest of the West Palæarctic Region, with the exception of Spain, Portugal, and North-

west Africa, Corsica and Sardinia, the Canaries, which are inhabited by local races. In England it is local, and, after a period of great decrease, is now to some extent on the increase again owing to protection (for summaries cf. J. A. Harvie-Brown, *Zool.*, 1903, p. 23; and Witherby and Ticehurst, *British Birds*, vol. i. p. 179). In Scotland it is now very scarce, and is nowhere common even in the south and centre, while it is very rare in the north, although it has nested in Skye and Caithness. [F. C. R. J.—A. L. T.]

3. Migration.—The migratory movements in Great Britain comprise—(a) an autumn immigration of continental birds on the east coast (cf. H. Saunders' *Manual*, 1899, and Nelson, *B. of Yorkshire*, 1907, p. 171). The return migration has been little noticed; and (b) subsequent southward emigration of the same birds along with the goldfinches which are summer visitors to our own country. This last is at its height in October, and the corresponding spring immigration takes place chiefly during the latter half of April and the first week of May, and at this season they have been recorded as arriving in hundreds in Somerset (cf. *B. O. C. Migration Reports*, ii. p. 178, iii. p. 182). As well as being a summer visitor and a bird of passage, it is a resident species. In Ireland it is resident, and "the reports from lighthouses do not seem to prove a transmarine migration, but rather betoken irregular movements round Ireland" (Ussher and Warren, *B. of Ireland*, 1900). The *B. O. C. Reports* (*loc. cit.*) record the species as migrating in flocks, but, according to Gätke, it is usually a solitary migrant (cf. *Heligoland as an Ornith. Observatory*, 1895, p. 389). [A. L. T.]

4. Nest and Eggs.—Nesting place: trees, especially fruit-trees, shrubs, less often in hedges. Nest: neatly built of moss, lichen, roots, wool, webs, and other material, lined with hair, wool, down, and perhaps feathers. (Pl. iv.) It is constructed by the hen according to Brehm and Dresser, by both sexes according to Bailly, *Ornith. de la Savoie*. Naumann states that the cock occasionally helps in carrying material. The eggs, usually 4-6 in number, are thin shelled, with a faint bluish tinge and a few distinct spots and streaks of deep red-brown, sometimes almost black, and a few fainter red-grey markings. Average size of 100 eggs, $\cdot 67 \times \cdot 50$ in. [$17 \times 12\cdot 9$ mm.]. (Pl. B.) Laying begins in May. The hen incubates (Brehm; N. Quépat, *Monographie du chardonneret*; F. E. Daniel, *in litt.*). Period of incubation about 14 days. The young remain in the nest about a fortnight (N. Quépat, *op. cit.*). Usually 2 broods. [F. C. R. J.—F. B. K.]

5. Food.—Seeds, insects. The young are fed, according to Bailly, on seeds

Photo by Riley Fortune

Goldfinch Nest

Photo by E. L. Turner

Linnet on Nest

Photo by Wm. Farren

Linnet's Nest and Eggs. An unusual Site

digested and regurgitated by the parents. They are at first fed on insects (H. Saunders, *Manual*). Both parents share in the duty. [F. B. K.]

6. **Song Period.**—All the year, except when moulting. [F. B. K.]

SISKIN [*Carduelis spinus* (Linnæus)]. Barley-bird. French, *tarin*; German, *Zeisig*; Italian, *lucarino*].

1. **Description.**—Identified by the black crown and chin, yellowish green plumage, and striated back and flanks. For some time after the autumn moult the feathers on the nape, hind-neck, and back have ash-grey tips. Length $4\frac{1}{2}$ in. [114 mm.]. The female is greyer, has the crown olive-green with dusky streaks, the chin dull white instead of black, and the underparts all striated except the belly. (Pl. 12.) The young differ from the hen in having the upper and under parts much more striated, the ground colour of the rump dull white instead of yellow, and with dusky striations, the sides of the head freckled dusky on a dull white ground, and no green tinge on the sides of the neck and breast. [W. P. P.]

2-3. **Distribution and Migration.**—It is found throughout Europe, but very locally up to the limit of coniferous forest-growth, although only as a winter visitor to the most southerly portions, such as the three Mediterranean peninsulas. It is resident in the pine forests of many parts of Ireland and of Scotland, from Perthshire northwards (cf. J. A. Harvie-Brown, *Fauna of the Tay Basin and Strathmore*, p. 114). It also nests regularly but very sparingly in parts of the south of Scotland and of the north of England, and is said to have bred in many English counties, but the evidence is by no means conclusive. Otherwise it is a winter visitor to the British Isles from Northern Europe, occurring on passage in the Hebrides, in Orkney, and in Shetland. As a winter visitor its numbers are subject to very considerable variation from season to season. It migrates in flocks. [A. L. T.]

4. **Nest and Eggs.**—Nesting place: usually from 10-50 feet high in coniferous trees. Nest: twigs, roots, dry grass, moss, lichen, lined with wool, down, hair, feathers, fibrous roots. It is constructed by both sexes according to Naumann; but Mr. Allan Ellison, who studied the species closely in Ireland, states that the male accompanies the hen to the nest, singing and twittering gaily, but takes no part in building or in collecting material (*Brit. Birds*, iii. 9). A case of the hen alone building is recorded of a caged specimen in the *Field* (1871, xxxviii. p. 3). The eggs, usually 4-5, rarely 6, in number, are pale blue, with a few markings of dark red-brown and fainter spots and streaks of red-grey. (Pl. B.) Average size of 72 eggs, $\cdot 64 \times \cdot 47$ in. [$16\cdot 3 \times 12$ mm.]. Laying begins in April-May. The hen

incubates (Brehm; C. Jex in the *Zoologisches Garten*, 1876, p. 217). Period of incubation 12-14 days. Two broods. [F. C. R. J.—F. B. K.]

5. Food.—Seeds, buds. The young are fed, according to Bailly, first on digested and regurgitated buds and seeds, afterwards on macerated seeds and fresh buds. In captivity “there is a difficulty in rearing the young, as in the earlier stages they appear to require *aphides*” (H. Saunders, *Manual*). Both parents share in feeding them (Bailly, *Ornith. de la Savoie*; A. Ellison in the *Zoologist*, 1887, p. 338). In captivity, however, the hen alone has been observed to perform this task (*Zoologisches Garten*, 1876, p. 217; 1890, p. 221). [F. B. K.]

6. Song Period.—All the year (Zander, *Vögel Mecklenburgs*).

LESSER-REDPOLL [*Linóta flammea rufescens* (Vieillot). Red-linnet, reddy, rose-linnet, red-cap, chivey, chippet-linet, French-linnet. French, *cabaret*, *petite linotte*; German, *kleiner Birkenzeisig*].

1. Description.—Recognised by the black lores and chin, the buff wing band, the red on the forehead, crown, breast, and rump, and the dusky striated brown back. After the autumn moult the red on the breast is obscured by brown, while the brown of the beak becomes wax yellow. Length $4\frac{1}{2}$ in. [114 mm.]. (Pl. 12.) The female has the red only on the forehead and crown, a very small area of black on the throat. The young lack the red altogether, as well as the black on the lores and throat; they have the head, neck, and back distinctly grey, thickly covered with dusky striations; the underparts are greyish white, with sharply defined dusky striations on the breast and flanks. [W. P. P.]

2. Distribution.—Our native lesser-redpoll is confined as a breeding species to the British Isles, the Alps, and probably the Carpathians, but only at fairly high levels towards the southern extremity of this range. In the British Isles it is local in the breeding season, especially in England, from the extreme southwest of which it is almost entirely absent. It is more regularly distributed in Ireland and Scotland, even to the outlying islands of the latter—breeding regularly in the Orkneys and some of the Inner Hebrides, and exceptionally in the Outer Hebrides (cf. J. A. Harvie-Brown, *Ann. Scot. Nat. Hist.*, 1902, p. 146), but not known to have done so in Shetland. [A. L. T.]

3. Migration.—Except for local movements within our shores, the species appears to be sedentary, not having been obtained at any of our light-stations. [A. L. T.]

4. **Nest and Eggs.**—Nesting place: sometimes in trees, as much as 40 feet from the ground (Ussher and Warren), but often bushes, hedges, occasionally in long heather, furze, or bracken. Nest: externally rather roughly built of twigs, coarse dead grasses, moss, wool, roots, etc., neatly lined with willow-down, hair, feathers. (Pl. v.) By which sex the nest is built is uncertain. The eggs, usually 4-5, rarely 6, in number, are easily distinguished by their dull surface and deeper greenish ground colour. The markings consist of a few spots and streaks of purplish brown, with underlying paler markings. (Pl. B.) Average size of 100 eggs, $\cdot 62 \times \cdot 48$ in. [$15\cdot 9 \times 12\cdot 2$ mm.]. Laying begins exceptionally in April, usually late in May. The hen incubates (F. E. Daniel, *in litt.*; J. Steele-Elliott, *in litt.*), but there is some evidence to show that the cock may share in the task. Period of incubation 11 days (Alfred Taylor, *in litt.*). Sometimes 2 broods appear to be reared. [F. C. R. J.—F. B. K.]

5. **Food.**—Seeds. The young are fed first with regurgitated seeds and buds, later with macerated seeds and fresh buds (Bailly, *Ornith. de la Savoie*); with regurgitated seeds (Zander, *Vögel Mecklenburgs*). A young bird, examined June 15, 1894, contained larvæ and fragments of a weevil (Newstead). Both parents share the duty. [F. B. K.]

6. **Song Period.**—Said to sing all the year except when moulting.

MEALY-REDPOLL [*Linóta flammea flammea* (Linnæus); *L. linaria* (L.). Greater-redpoll. French, *sizerin boréal*; German, *Birkenzeisig* or *Leinzeisig*].

1. **Description.**—Is like the lesser-redpoll, but larger, has the rump more or less striated and tinged rose-red; it lacks the rufous tint in the brown of the back. Length 5 in. [127 mm.]. The hen has red on the forehead and crown only, has less black on the throat, the black forehead is scarcely visible, and the general appearance is greyer and paler. The young differ from the female in being darker, more heavily striated, and lack the red. (No plate.) [W. P. P.]

2-3. **Distribution and Migration.**—This lighter and larger continental race is found breeding in the arctic and higher subarctic regions of Northern Scandinavia and Russia, and confines its southward visits, as a rule, to the more northern countries of the temperate zone. It is a common winter visitor to most of the east of Great Britain, from Shetland to Durham, and is of fairly frequent occurrence in other parts of the British Isles, especially on the west coasts of Scotland and Ireland. For the purposes of this note we may include also the following

forms—*Linota flammea holboellii*, *L. f. rostrata*, *L. hornemanni hornemanni*, and *L. h. exilipes*—which have been known to occur in the British Isles in the winter months, but whose breeding grounds extend westward from Spitzbergen, Iceland, and Jan Mayen to the subarctic regions of North America, as well as east through Siberia. The question of the rank to be assigned to these forms will be discussed in the supplementary chapter on "Classification." [A. L. T.]

4. **Nest and Eggs.**—Is not a British breeding species. See previous note.

5. **Food.**—Seeds.

6. **Song Period.**—Not recorded.

TWITE [*Linota flaviróstris* (Linnæus). The rock-, hill-, heather-, or mountain-linnet, yellowneb-lintie. French, *linotte montagnarde*, or *linotte à bec jaune*; German, *Berghanfling*].

1. **Description.**—Distinguished from the redpolls by having red on the rump only, white outer margins to the inner primaries, the beak more or less yellow in summer as well as in winter, and by the absence of black on the chin and lores. To the colour of its beak it owes the name *flaviróstris*. Length 5 in. [127 mm.]. (Pl. 13.) The hen has no red on the rump, which is striated. The young resemble her, but are darker, and have the major coverts uniformly coloured. [W. P. P.]

2. **Distribution.**—As a breeding bird it is confined to North-Western Europe—chiefly Norway, Lapland, and the British Isles—while it visits most parts of Northern Europe, but is only a rare wanderer to the southern countries. A paler race, sub-specifically separated as *L. f. brevirostris*, breeds from Asia Minor to Manchuria. The twite is absent from the south and east of England, although it has bred exceptionally in Devonshire (cf. C. E. Pearson, *Bull. B. O. C.*, xiv. p. 91). It breeds on the elevated moors of Central and Northern England, but is nowhere abundant, and is everywhere inclined to be local, breeding sporadically in colonies; also, and more regularly, in similar parts of Scotland, becoming abundant towards the west and north-west, and in the isles, including Orkney and Shetland. In Ireland it is widely distributed. [A. L. T.]

3. **Migration.**—In winter it seeks lower levels, and there is a certain amount of movement in autumn, but this does not make itself felt very far south of the species' breeding range. Except for such local movements, the twite is stationary in the British Isles. [A. L. T.]

4. **Nest and Eggs.**—Nesting places: very variable—bushes, heather, creepers,

the ground under stones, sods, etc., grass, walls, peat-stacks, banks of streams, ledges and crevices of sea-cliffs, rabbit burrows, haystacks (Saxby, *B. of Shetland*). Nest: roots, grass, stalks, moss, twigs, lined with hair, wool, fur, and feathers. (Pl. 13.) It is constructed by both sexes (Saxby, *op. cit.*; Harvie-Brown, *Fauna N.-W. Highlands*). The eggs, usually 4-6, rarely 7, in number, are bluer as a rule than those of the linnet, and more boldly marked with a few streaks of very dark red-brown. (Pl. B.) Average size of 100 eggs, $\cdot66 \times \cdot49$ in. [$16\cdot9 \times 12\cdot6$ mm.]. Laying begins in May. Which sex incubates not recorded. Period of incubation not recorded. Two broods (R. Gray, *B. of the West of Scotland*). [F. C. R. J.—F. B. K.]

5. Food.—Seeds. The young are fed with regurgitated seeds (Zander, *Vögel Mecklenburgs*). Saxby implies that they are fed by both parents. [F. B. K.]

6. Song Period.—Uncertain.

LINNET [*Linóta cannábina* (Linnæus). Lintie, brown-linnet, whin-linnet, redbreasted-linnet, red-linnet, robin-linnet, thorn-linnet, furze-linnet, heather-lintie, bent-linnet, blood-linnet, rose-lintie, gorse-bird. French, *linotte*; German, *Blut-hanfiling*].

1. Description.—Differs from both the redpolls and twite in having each tail feather margined with white, except the two middle, which have light-brown edges. The outer webs of the inner primaries are also white, the beak horn-grey. In summer plumage the male has crimson on the crown, forehead, and breast, its general coloration being brown and grey, with chestnut on the mantle. From autumn to spring the crimson makes way for grey. Length $5\frac{1}{2}$ in. [140 mm.]. (Pl. 11.) The female lacks the crimson and is more striated. The young are still more striated, and develop during the immature stage broad brown tips to the primaries. [W. P. P.]

2. Distribution.—It is widely distributed throughout Europe below the 60th parallel, and in Scandinavia up to 64° N. lat., but in the Mediterranean basin, and in Siberia as far as the Altai Mountains, it is replaced by local races. In the British Isles it breeds nearly everywhere where waste lands exist, but is not found in Scotland at the higher levels, and becomes local and uncommon towards the north-west of that country and in the outlying islands. [A. L. T.]

3. Migration.—It is resident as a species in most parts of the British Isles, but is only a summer visitor to some. There is a considerable southward emigration in autumn, at which season also a large number of birds from the Continent arrive on our east coast. It is noticed as an immigrant on the south and other coasts

of England from mid-March till late in April (cf. *Brit. Ornith. Club Migrat. Reports*, i. p. 125, ii. p. 178, iii. p. 182). "The migration reports yield notices of it all round the Irish coasts and at all times of the year" (cf. ; and see further Ussher and Warren, *B. of Ireland*, pp. 63-4 ; and see also R. M. Barrington, *Irish Migrat.*, 1900). It migrates in small parties or flocks. [A. L. T.]

4. Nest and Eggs.—Nesting place : usually at no great height, in bushes, especially gorse, and in hedges. Nest : roots, moss, grass, stalks, lined with hair, wool, feathers, down. (Pl. iv.) It is built by the hen with but little help from the cock (Naumann ; Bailly, *Ornith. de la Savoie*). The eggs, usually 4-6, occasionally 7, in number, are rather variable, bluish white or pale blue in ground colour, sometimes unmarked, and at other times spotted, blotched, or freckled with purplish red, with underlying paler markings. (Pl. B.) In size, too, they are variable, the largest exceeding small greenfinches' eggs in size, but 100 eggs average $\cdot 71 \times \cdot 51$ in. [$18\cdot 1 \times 13\cdot 1$ mm.]. Laying begins in April-May. The hen incubates, but in the case of one pair the cock was seen to relieve his mate every evening between five and seven o'clock (Helm, quoted in Naumann). Period of incubation 14 days (W. Evans, *Ibis*, 1891). Usually 2 broods. [F. C. R. J.—F. B. K.]

5. Food.—Seeds, berries, insects, buds, fruit. The young are fed by both parents on digested and regurgitated seeds (Bailly, *op. cit.* ; Zander, *Vögel Mecklenburgs*). [F. B. K.]

6. Song Period.—All the year. [F. B. K.]

HOUSE-SPARROW [*Passer domesticus* (Linnæus)]. Spadger, spuggy, sprig, sprug, spyng, sprong, craff, row-dow, thatch-sparrow, Philip. French, *moineau* ; German, *Haussperling*, *Hausspatz*].

1. Description.—In summer the cock may easily be distinguished from the soberly brown-hued hen by the ash-grey on the head and rump, the brilliant black gorget contrasting with the white cheek-patch and the bluish black beak. The hen has the top of the head and nape greyish brown, a conspicuous post-ocular streak of buff, the mantle and wings brown, instead of mahogany-red as in the male. Length 6 in. [152 mm.]. In winter the grey and black of the cock are obscured by brown, the white by a dull yellowish tinge, and the beak becomes brown like that of the hen. (Pl. 10.) The young bird resembles the latter, but the white wing bar and the post-ocular streak are barely traceable. The median coverts are brown instead of black, and the throat and breast are dull white. [W. P. P.]

2. Distribution.—Except in Italy, Corsica, Sardinia, and Sicily, it is found in nearly every part of Europe where there are human habitations and cultivation. It is also represented by closely allied races of the same species in North Africa, West Asia, and India. As an artificially introduced species in North America, Australia, and New Zealand, it has multiplied and spread to an extraordinary extent. It is abundant throughout the British Isles, except on a few of the smallest islands and in some Highland localities, but of comparatively recent appearance in some of the outlying portions formerly uncultivated. [A. L. T.]

3. Migration.—Resident, but the fact that it forsakes some exposed localities in winter, and that it sometimes occurs “singly or in flocks, at the lightships and rock-stations” (cf. Ussher and Warren, *B. of Ireland*, 1900, p. 59; and others), seems to indicate that it migrates at times. [A. L. T.]

4. Nest and Eggs.—Nesting place: any convenient recess, *e.g.* in ivy-covered trees, rocks, cliffs, stacks, eaves, spouts, holes, and also sometimes among the branches of trees. The nest is domed when in the open, and partially so when sheltered by ivy or in a hole. It is very carelessly made of straw, hay, with odds and ends, and warmly lined, usually with feathers. Both sexes share in its construction. The eggs, 3-7 in number, but usually 4 or 5, vary a good deal, and one egg in a set is often much more lightly marked than the rest. They are generally mottled and spotted all over with varying shades of ashy grey and brown. Some varieties are distinctly reddish in tone; others have a tendency to a cap of darker markings at the big end, while occasionally white eggs are found. (Pl. B.) Average size of 100 eggs, $\cdot 86 \times \cdot 61$ in. [$22 \times 15\cdot 6$ mm.]. Laying usually begins in May, but in towns, and where the climate is mild, often much earlier. According to Naumann both sexes incubate, according to others the hen only. Period of incubation 11-14 days. In an incubator 13-14 days (W. Evans, *Ibis*, 1891). Two to three broods, sometimes more, are raised. [F. C. R. J.—F. B. K.]

5. Food.—Seeds, buds, fruit, berries, insects, spiders. The young are fed on insects. Also on grains of wheat and barley (O. V. Aplin, *B. of Oxfordshire*). Both parents share the duty. [F. B. K.]

6. Song Period.—In the case of individual birds a short continuous series of notes may sometimes be heard, to which the term song might be applied. Flocks may often be heard, in autumn and winter, uttering for several minutes a continuous chatter. [F. B. K.]

TREE-SPARROW [*Pásser montánus* (Linnæus). Rock-sparrow, red-headed-sparrow, copper-head, mountain-sparrow. French, *friquet*; German, *Feldsperling*; Italian, *passera maltugia*].

1. Description.—Distinguished from the house-sparrow by its ruddy brown crown and nape, triangular black patch in the white of the cheek, double alar bar, and much more graceful appearance. Length $5\frac{1}{2}$ in. [139·5 mm.]. (Pl. 10.) The sexes are alike. The young differ in having the alar bars tinged with buff, and the black on the cheek and throat both less in area and paler in hue. [W. P. P.]

2. Distribution.—Palæarctic, distributed throughout the greater part of Europe and Siberia east to China and Japan, as well as in the Indian region (India, Sumatra, Borneo, Java, etc.). In Europe it is rare in Spain, and absent from Portugal, Corsica and Sardinia. In Scandinavia it is now found up to $70^{\circ} 30' N.$, and in North Russia to the Petchora valley. As an introduced species also, it has been obtained in North America. In Northern Europe it is extending its range, and is now found in Arctic Norway, and has also been recorded as common in the Faroes, where it was unknown previous to 1869 or thereabouts, but appears to have again disappeared of late. In the British Isles it is a local species; it is found in England in every county except Cornwall and Devon, but is very scarce in the Lake District. It now breeds in Wales (although almost unknown in the west and south), in the Hebrides, and in Shetland. In Ireland it is beginning to spread from a locality in Co. Dublin, from which it was first recorded in 1852, being otherwise unknown except as an occasional migrant. The fact that it may have formerly existed, but have been overlooked, owing to its likeness to the house-sparrow, in some of those districts from which it has been only recently recorded, must be taken into consideration. [F. C. R. J.—A. L. T.]

3. Migration.—It is a resident species; also an autumn immigrant. The autumn immigration is at its height in October, and appears to consist of (a) immigration on the north-eastern coast from Northern Europe, and (b) immigration to the south-east of England from Central Europe (cf. *Brit. Assoc. Report*, 1896, p. 457). The birds which are recorded from the Essex, Norfolk, and neighbouring light-stations in April (cf. *B. O. C. Migration Reports*, i. p. 125, ii. p. 179, and iii. p. 182) are probably migrants returning to Central Europe. There is also evidence of some migration between our shores and countries farther south: birds are recorded from our south coast lights in the latter half of March (cf. *loc. cit.*). A gregarious migrant. [A. L. T.]

Photo by E. L. Turner
Tree Sparrow's Nest with Covering Tile removed (see Pl. 16.)

Photo by Wm. Farren
Lesser Redpoll's Nest

Photo by Seton Gordon

Bullfinch on Nest

A black and white photograph of a large, rectangular, light-colored object, possibly a piece of paper or a small board, with numerous small, dark, circular holes or indentations arranged in a grid-like pattern across its surface. The object is oriented horizontally and occupies most of the frame. The holes are small and dark, contrasting with the lighter background. They are arranged in a somewhat regular grid, though not perfectly aligned. The lighting is even, and the background is a plain, light color.

4. **Nest and Eggs.**—Nesting place : always in holes or hollows of some kind, in trees, buildings, walls, sandpits, cliffs. Nest : dry grass, roots, straw, wool, lined chiefly with feathers. (Pls. 10 and v.) It is constructed by both sexes (Bailly, *Ornith. de la Savoie* ; S. E. Brock, *in litt.*). The eggs, usually 4-6 in number, resemble those of the house-sparrow, but besides being smaller are much more glossy and more heavily marked. They are also darker and show more brown as a rule. Often one (sometimes two) eggs are much lighter than the rest. (Pl. B.) Average size of 103 eggs, $\cdot77 \times \cdot55$ in. [$19\cdot5 \times 14$ mm.]. Laying begins usually in May, exceptionally earlier. According to Naumann both sexes incubate. Period of incubation 13-15 days (Bailly, *op. cit.* ; Gadeau de Kerville, *Faune de la Normandie*). Two to three broods. [F. C. R. J.—F. B. K.]

5. **Food.**—Same as the house-sparrow. The young are fed on insects, soft vegetables, etc. (H. Saunders). Both sexes share in the duty (Bailly, *op. cit.* ; F. E. Daniel, *in litt.* ; N. H. Foster in the *Irish Naturalist*, 1906, p. 221). [F. B. K.]

6. **Song Period.**—The pairing season (W. H. Hudson, *British Birds*).

CROSSBILL [*Loxia curvirostra*, Linnæus. French, *bec-croisé* ; German, *Kreuzschnabel* ; Italian, *crociere*].

1. **Description.**—Recognised by the crossed tips of the bill. Length $6\frac{1}{2}$ in. [165 mm.]. The plumage of the fully adult male is mostly crimson, with a touch of orange, the female yellowish green. (Pl. 8.) The young up to the first autumn moult are mostly smoke-brown above, dull white below with dusky striations, there being little difference between the sexes. The mandibles do not begin to cross till about the time the bird quits the nest. After the autumn moult the young are still striped, the males being tinged with orange, the females with yellow, on the underparts, head, and rump. After the second moult red mixes with the yellow in the males, there being remains of spots and striations above and below. The coloration of individual males at this stage varies considerably, the full red not being attained till the third or fourth year. Adult males, especially in captivity, sometimes retain the yellow or revert to it in old age. (The description of the young is based on those of Wheelwright (*Zool.*, 1870, p. 2236) and V. Fatio (*Oiseaux de la Suisse*). [W. P. P.]

2. **Distribution.**—If we take all the subspecies together we find that *Loxia curvirostra*, as a whole, is widely distributed throughout the Palæarctic and northern Nearctic Regions, wherever there are coniferous forests. In the British Isles we have two forms, the Scottish crossbill, *L. curvirostra scotica*, Hartert,

which nests regularly in the old pine-forests of Scotland, and the ordinary continental race, *L. curvirostra curvirostra*, L., which has frequently nested in suitable localities in many parts of England and also in Ireland. It is, however, more commonly met with in winter, in small parties or flocks. [A. L. T.]

3. Migration.—In some seasons considerable “irruptions” occur. For instance, in the well-marked irruption of 1909, “during late June, all July and August, these birds were widely spread over Great Britain, but seem to have come most under notice at the northern islands of Scotland, where forests and other cover are non-existent,” and the immigration was “remarkable for the number of the visitors, and the wideness of the area covered. They were first detected on Fair Isle . . . on the 23rd of June. Their numbers afterwards increased, as if the birds had come . . . in a series of waves, and as many as 300 were seen some days” (W. Eagle Clarke, *Ann. Scot. Nat. Hist.*, 1909, pp. 215-217; see also collected notes, *British Birds*, vol. iii. *passim*, but especially pp. 226-228 and maps). In tracing the origin of these immigrants, it is worth noting that, during the same period, this species was also recorded from the Faroes, two specimens, now in the British Museum, being obtained from a flock of eight first seen on July 2 (Rev. Francis Turreff, *in litt.*). In the same connection it should also be mentioned that a number of specimens received by Mr. Eagle Clarke (*loc. cit.*) “all belonged to the continental race.” The species is a regular migrational visitor to Shetland. [A. L. T.]

4. Nest and Eggs.—Nesting place: in firs and larches, rarely less than 35 feet above the ground. Nest: characteristic, and not to be confused with those of other species—a platform of larch or fir twigs; on this dry grass, wool, sometimes moss and roots, with a lining of finer grasses, more rarely hair (Ussher and Warren, *B. of Ireland*). (Pl. 8.) It is said to be constructed by the hen (Zander, *Vögel Mecklenburgs*). The eggs, usually 3-4, occasionally 5, are like large greenfinch’s eggs, but the markings are generally darker and fewer. The usual type has a few spots or scrawls of dark purple-red or almost black on a greenish white ground; but some eggs are unmarked, and others are only faintly blotched and smeared with pale reddish brown. (Pl. B.) 100 eggs of the Scotch race average $\cdot 83 \times \cdot 62$ in. [$21\cdot 24 \times 15\cdot 91$ mm.] in size. Laying begins as a rule in February-March, but on the Continent eggs and young have been found usually from January onward, but occasionally as late as September or even December, so that probably more than one brood is reared at times. It makes its nest thicker in winter than in summer (Keller). According to one writer the hen alone incubates (Zander, *op. cit.*).

Period of incubation 14 days (Tiedemann), 15 days (Bouteille, *Ornith. du Dauphiné*).

[F. C. R. J.—F. B. K.]

5. **Food.**—The seeds of larch and fir cones, kernels of berries, fruit, buds, insects. The young are usually fed on regurgitated seeds (Zander, *op. cit.*). Macgillivray implies that both sexes share in this duty. [F. B. K.]

6. **Song Period.**—Heard usually in the spring, occasionally by moonlight, but generally in the morning (Ussher and Warren, *op. cit.*). Both sexes sing (Wheelwright in the *Zoologist*, 1870, p. 2238). [F. B. K.]

BULLFINCH [*Pýrrhula pyrrhula* (L.); (*P. europæa*, Vieill.). Bull-spink, bully, bully-blackhead, hoop, olf, nope, mawp, pope, redhoop, blood-olf, tawny, tony-hoop, black-cap, monk, coal-hood, plum-bird, thickbill, bud-picker, alph, alp. French, *bouvreuil*; German, *Gemeiner* or *Kleiner Dompfaff* or *Gimpel*; Italian, *ciuffolotto*].

1. **Description.**—Recognised by its black hood, portly red (rose-vermilion) breast, and in flight by the white rump which contrasts with the violet-black tail and grey mantle. Length 6 in. [152 mm.]. (Pl. 16.) The hen differs in having the mantle sepia-brown and the underparts vinous-brown. The young differ from the hen in having no black on the head, the whole of the upper parts, except the white rump, grey tinged with brown, the underparts pale brown, and the wing coverts tipped with buff instead of grey. [W. P. P.]

2. **Distribution.**—Our local race of this bird, *P. pyrrhula pileata*, Macgillivray, is confined to the British Isles, where it is sedentary, but other subspecies are found on the Continent; Scandinavia, Russia, North-East Germany, Hungary, and West Siberia being inhabited by the northern race, while the southern form is found in Middle and Western Europe from North Spain and North Italy to West Prussia, and a third race is found in the Caucasus. The British form is tolerably common in all wooded parts of the British Isles, but though increasing its range is not yet known to have bred in Orkney, Shetland, or the Outer Hebrides, though it occurs in Skye and has nested in Eigg, Mull, Islay, Jura. In Ireland it is commoner than in the middle of the last century (Ussher and Warren, *B. of Ireland*, p. 68). [F. C. R. J.]

3. **Migration.**—The northern race occurs occasionally on migration on our east coast (Yorkshire), but otherwise there is little or no evidence of anything more than occasional local movements on the part of our resident birds. [A. L. T.]

4. Nest and Eggs.—Nesting place: thick bushes, especially evergreen and hedges. Nest: twigs and moss, neatly lined, usually with roots and a little hair, and more rarely a few feathers or wool. (Pl. v.) It is constructed by both sexes (Naumann; Bailly, *Ornith. de la Savoie*); by the hen only (Petényi, *Ornith. Fragmente*). The eggs, 4-6 in number, are clear greenish blue, marked with a few spots and streaks of dark purplish brown, sometimes almost black, with faint underlying markings, which generally are thicker towards the big end and sometimes form a zone. Rare varieties have reddish markings on a white ground, or are white without markings. (Pl. B.) Average size of 100 eggs, $\cdot77 \times \cdot57$ in. [$19\cdot5 \times 14\cdot46$ mm.]. Laying begins late in April or early in May. According to Bailly, Roux (*Ornith. provençale*), and the *Field* (1874, xliii. p. 627), both sexes share in incubation. "Chaque jour le mâle participe à l'incubation" (Bailly). According to the observation of others, this task is performed by the hen alone (Naumann; F. Schlag, *Der Dompfaff*; Steele-Elliot, *in litt.*; H. Saunders, *Manual*). Period of incubation 13-15 days. Incubated under a canary 13 days (W. Evans, *Ibis*, 1891). The young remain in the nest from 2-3 weeks, according to the weather (F. Schlag, *op. cit.*). Broods 1-2. [F. C. R. J.—F. B. K.]

5. Food.—Seeds, hawthorn kernels, fruit buds. The young are fed partly on insects and their larvæ, and partly on seeds softened by the parents (H. Saunders, *Manual*; E. Hartert, *Vögel der Paläarkt. Fauna*); with semi-digested seeds when 3-4 days old (W. Farren, *in litt.*); with shelled and softened seeds (Naumann; Zander, *Vögel Mecklenburgs*). [F. B. K.]

6. Song Period.—In the breeding season. It has been heard singing in winter (Ussher and Warren, *op. cit.*). The hen also sings, and, according to Petényi (*op. cit.*), begins to do so as soon as the young are able to take care of themselves, continuing till the spring moult. [F. B. K.]

THE FINCHES

[EDMUND SELOUS]

If there be any one group of our smaller birds by whose total disappearance from the land we should lose more than by that of any other, it is perhaps—though only perhaps—the Finches, those brisk, bright, active, and cheerful denizens of our woods, fields, and hedge-rows. There are, indeed, the *Turdidæ*, in which both the black-bird and thrush are included—but I rule these out as not small enough. The robin is his own group—*Erithacus*, a bird quite *per se*. It were much to lose *him*, but could we set even the robin against all our little finch army, and prefer to lose them all? It must be held at least doubtful, even were the wren counted with him. No one will seriously name the Tits, and if some would urge the Larks or the Warblers, here too, as far as the first are concerned, it would be practically only the skylark we should lose—a heavy calamity truly!—yet, as against the imagined one, there is this to be said, that if we lost both him and all our warblers too—nightingale, blackcap and all—it would at least be only in the leaf of the year that we should miss them, and not the whole year through. The lark is forgotten in winter, and, contrary to what is usual, it is our summer prosperity that the rest would have abandoned, leaving to stay on with us, both through that and our adversity—"the winter of our discontent"—the true Finches, the *Fringillinæ*.

It is with these, and not any further with the above speculation, which, in serving to introduce them has now served its purpose, that this chapter will deal, and first with that strange-looking species, the crossbill, or common crossbill—common, but by no means here familiar—a bird which, with its few "co-mates and fellows" in the peculiarity that its name implies, differs from all others of its class—an excellent reason, surely, for not on that account alone separating it

from any family whatever, much less its own, as some ("*horresco referens*") have mistakenly attempted to do. For this reason, if for no other—for who would not redress an injury when it lies in his power to do so?—I place *Loxia curvirostra* first upon my list.

The use, and consequent *raison d'être* of the above-mentioned strange abnormality has now long been thought a part of our knowledge. Yet it is perhaps not quite certain that the mere outward shape of the mandibles—unique though it be—has anything to do with the bird's feeding habits. For what are the facts? As first explained by Townson, and afterwards, more scientifically, by Yarrell, the mechanism of the required bones and muscles is such that, on the mandibles being opened sufficiently widely—but no more—for the tips to meet, these, though crossed before, do now so meet, becoming opposed to each other, in a straight line. The bill, therefore, instead of being a double-pointed instrument, as it was just before, is changed, for the nonce, into one of the more ordinary type, only broader, and is thus inserted between the scales, preferably, of a fir-cone, when, being opened still wider, the mandibles now again diverge laterally, but to a much greater degree, and with such power that the scales are forced wider apart, and, the seeds lying between them being thereby loosened, the bird extracts them with its tongue, which, to complete the perfection of the adaptation, acts after the manner of a scoop.

But what part, it may be asked, is played in all this by the crossing of the bird's bill, in the manner peculiar to it, when closed? Were it of the usual shape it could still be inserted—perhaps with equal efficacy—between the scales, and its subsequent lateral extension in the way described should then, as now, do the rest. If so, then that peculiar conformation which so strikes the eye, and gives its name to the species, is but incidental to the general scheme of the mechanism,¹ in which case the crossbill, as such, must be looked upon not as a main proposition in evolutionary physiology, but as a corollary

¹ It may even have become a secondary sexual character, since it would appear that the cross is more pronounced in the male than the female, and is also subject to much variation. See *British Birds*, January 1910.

merely. With the law of correlated variation of parts as a known factor in nature, this does not seem wholly impossible; or a Darwinian, who was also a believer in Lamarck's doctrine,¹ might explain the facts by supposing that the ancestral crossbill, before it had become so specialised, would, by perpetual endeavours thus to force the scales open, have gradually made its bill crooked, so that the two tips ceased at last to meet, from which point, if such a shape had not proved detrimental—and we see that it did not—the process of modification would have continued. He might further surmise that such birds as could not, by opening their mandibles a little, get them into a straight line, to begin with, were placed at a disadvantage as against those who could do so—probably because the pronged bill would not enter the sheath with facility—and that thus the whole complicated structure has at last come about. It is true that, as observed by Townson,² some time before 1799, in his study at Göttingen, the crossbill, when actually extracting the seed, grasps it (as I understand him to mean) between the pointed tips of the mandibles. But can we suppose that, the protecting sheath being once forced open, the contents of it could not be extracted with equal or sufficient facility, were the shape of the beak normal? Being as it is, it must be used as it is, but this may be the resultant, rather than the cause. Still it is, perhaps, along these lines of research that the true meaning of the abnormal curve may become manifest. The pointed tips might also be specially serviceable in the tearing of the sheath to pieces, which the bird has sometimes even now to resort to, but one does not gather clearly from the accounts of observers³ that this is the case. It is not, however, intended by these remarks to do more than point out certain doubts and difficulties which may still appertain to this ornithological problem.

The abnormality of its beak is not the only way in which, from a

¹ I do not think this is exploded or can be exploded, however genial the experiments, in the laboratory only, where the conditions of nature are not reproduced with sufficient accuracy. Professor Francis Darwin, if I mistake not, has recently expressed himself as still in favour of Lamarck's law, or, at least, as unconvinced against it.

² *Tracts and Observations in Natural History and Physiology*, 1799, p. 119. Before reading Townson, I never could make out that any one had actually seen the lateral motion.

³ *E.g.* Naumann, *Naturgeschichte der Vögel Mitteleuropas*, iii.

Darwinian standpoint, the crossbill is interesting. There is its colour, for instance—in the male a rich crimson, touched with the rose—which, as he glints amidst the dark, yet often sun-flecked, fir-forests of his native north, or over the snow that enshrouds them, must at times make him disadvantageously conspicuous. None, surely, but such as go all lengths in the theory of protective coloration—to whom, were they free, in such a case, to apply it, a crimson sunshade, or even its bearer, would appear unobtrusive—could explain such plumage through such an agency.

And yet, in some sort—in a roundabout, and, as it were, underhand way—the protection theory crept in, in regard to the male crossbill (leaving the female aside) almost before it was well understood; at least the supposed facts on which it could take action were ready waiting for it, by the time it appeared. For, owing to the vagaries of some caged specimens, it was strangely supposed that the bird, after making, as it were, a brilliant *début*, belied its early promise, and became duller and duller, as men, but not birds, are accustomed to do. In a word, a controversy arose as to whether, in its “unhouselled, free condition,” it was the male dull yellowish crossbill that became bright red, or the male bright red one that became dull yellow. If the latter, then the bird, though unaccountably handicapped at its start in life, was yet in course of becoming “protected.” Possibly a few yellowites may still linger amongst us, just as a few Jacobites still do, but those who have read Naumann’s remarks on this subject, supplemented and reinforced as they are by later German and other continental authorities, cannot doubt that, under natural conditions, whatever passage takes place is, as any evolutionist, who is also a believer in sexual selection, would have expected, from the duller to the brighter hue. That the contrary is not infrequently the case with crossbills kept in captivity, is doubtless to be explained as a reversion to the earlier coloration, when the sexes were less differentiated, due, most probably, to some obscure disturbance in the system, attendant on so sad a state—men too become yellow in prison. The various theories, however, which

Plate 8

Crossbills, Male (red) and Female (green), going to their Nest

By H. Goodchild

stand connected with a bird's outer garb may be discussed, more fitly, hereafter, in relation to the Finch family as a whole.

In addition to the evolutionary points above mentioned, we have in one, at any rate, of several deviations from the more common type of *Loxia*, concerning the specific or merely varietal value of each of which there is, of course, the usual barren disputation (for, strangely enough, this has not ceased with Darwin, though the whole essence of such jangles has crumbled at his touch)—we have, I say, in the parrot-crossbill (*Loxia pityopsittacus*) an instructive illustration of varying habit bringing with it varying form; for it is perfectly evident that, in this bird, we see the final or rather up-to-date result of certain individuals of the common kind having come to eat the seeds of the Scotch fir, as well as, and so, gradually, instead of, those of the larch and spruce, which form the staple of the latter. As more strength was needed to extract these, a stouter bill and larger body were gradually acquired by those birds which delighted to do so, till, insensibly, and almost without knowing it, they found themselves parrot-crossbills. That each kind, now preferring its own tree, should stay, or go, where this grew, was of course a necessity of the case, and thus a difference in geographical distribution was added to that of habit and structure, for the Scotch fir does not extend so far north as either the spruce or larch.¹

Here, then, we seem to see, pretty plainly, a process of bodily modification following upon a mental one, for though certain crossbills, through having harder beaks, or more vigorous muscles to work them, may have been led to attack the Scotch fir-cones as well as the others, yet why, because of this, should they have come to prefer the former, all being equally open to them? Taste, however, being capricious, that the change should have been founded upon the preference presents no difficulty. For myself, I have long played with a theory, in regard to this, which I will now, at last, seriously bring forward, namely, that the first crossbill of all who began to pay atten-

¹ See Seebohm, *A History of British Birds*.

tion to the harder kind of cone—the original founder of the parrot clan—*may* have had a bill not only not above the average robustness, but even, in some trifling degree, below it; only that, being a bird of a more investigative turn, and possessing force of character, he did, notwithstanding, having first, by some accident, discovered that he liked them, succeed in extracting a seed or two of these, now and again. It may have been so. It is, of course, impossible to prove it, but on the other hand, it is not susceptible of disproof.

Though there can be no reasonable doubt that the unique *muscular* adaptation of *Loxia curvirostra* has been gained in relation to his principal food—the seeds of the fir, namely—yet is he not confined to this diet, but will, upon occasion—any occasion where an orchard presents itself—condescend to apples or pears. In England, which is a pomaceous rather than a coniferous land, this happy pliancy of disposition may be well seen—when the bird is; but unfortunately the bird is rare, by which I mean that were any right peasant, from the Land's End, at any rate, to the Tweed, to see one, he would, no more, probably, than in the days of Matthew Paris,¹ have a name to his tongue for it. In Scotland, indeed, it breeds regularly in certain counties, whilst there are but few perhaps of our own in which it has not been, from time to time, observed, or its eggs pilfered by the scientific, or non-scientific, collector.² Yet this I know, that one may live in the country, and grow grey, without seeing the common crossbill, though, all the while, you will hear of him as “an irregular autumn or winter visitor, often then appearing in large flocks, which, at the former season, devastate orchards.” So it was, indeed, in 1257 and 1593, as witnessed by observers whose

¹ “*Aves mirabiles quæ nunquam in Anglia antequam videbantur.*”

² The difference between them is this, that the first, in the name of science, does more harm than the last, in the name of absurdity only, which has less stamina. But the two forms approach each other so closely that, even as sub-varieties, it is not always easy to keep them distinct, and as much of true science, probably, appertains to the one as to the other. Both have equally grasped the fact that no two shells of the egg of any one species are marked quite precisely alike, and it interests them more than the whole of Darwin, or any other problem in life. It will be clear, of course, to the scientific collector proper that only the scientific collector, so-called, can be here intended. Exactly, and I leave them to settle it which is which. [As stated in the Preface, the writer is solely responsible for the opinions he expresses.—ED.]

luck has been recorded in Latin; but, for myself, I have seen the orchards year after year, generally very well laden, and, as one may say, waiting, but I have not yet seen them devastated. However, *tout vient à qui sait attendre*—brighter days may be in store.

The crossbill is not the only bird of the Finch tribe whose food consists, largely, of the seeds of conifers. The pine-finch or grosbeak, though, according to Naumann,¹ he but seeks them on the ground, has similar leanings, but a question of more interest for us who are dealing with British birds, is whether any of our own species both affects and extracts them. As a general proposition, and so far as it applies to the indigenous firs of our woods and plantations, this does not appear to be the case, but the greenfinch will perseveringly attack the cones of some introduced trees of this family, the superior size of which may make it easier for him to pick out their seeds. To do this he does not, as the crossbill generally does, detach the cone, but, hanging head downwards, upon it, or, should this be too difficult, from a tuft of the surrounding pine-needles, inserts his beak between the somewhat widely distended scales, and beats with it upon them so quickly that the noise thus produced has quite a vibratory ring in it, and is sufficiently loud to attract attention and rouse curiosity. In doing this the bird moves its head so continuously and briskly that one is reminded of the way in which the little woodpecker makes its drumming love-note in the spring-time—the motion, however, is here more lateral. At last, if successful, it pulls out the seed, and, flying off with it to some “more removed” (or congenial) “ground”—as a shrubbery, in which it delights—there tastes the reward of its labours, first, however, as in all other such cases, shelling it.

It is in winter that I have seen the greenfinch acting in this manner, and it is possible that in Scotland, where fir-forests become a feature of the landscape, it may attack the seeds of these in the same manner. If not, however—and I have not yet heard of its

¹ *Naturgeschichte der Vögel Mitteleuropas*, iii.

doing so—this perhaps makes my own observation the more interesting, as showing us the first or earlier steps towards what might, in time, and under favouring circumstances, become first a common, and, at last, an almost exclusive habit. The larger cones, with their scales, as I have seen them, more widely separated, should certainly be easier than our own to rob, and, moreover, the seeds, being more of a mouthful, or by the superiority of their flavour, may have made a stronger appeal. But however this may be, we see here in this familiar bird of our own, of ordinary Finch habits, the base, as it were, of a ladder which, carried on, rung by rung, through various members of the group to which it belongs, would link it, at last, with the crossbill, whose structure has become abnormally modified, and its geographical distribution more or less limited, in relation to this particular diet.

To me, indeed, it has always seemed one of the most interesting things in field natural history, that, by the study of habits not yet become remarkable in our own fauna, we can often better understand essentially similar, but more highly developed, ones belonging to allied species that we may never, very likely, have the opportunity of observing. This perhaps is a line of thought which may be carried to an extreme—descending into trivialities—and if so, I confess that it is my habit and intention so to carry it. Thus, having just, “as in a glass, darkly,” seen the greenfinch become a crossbill, I will now imagine him on the way to becoming a sparrow; not, indeed, in a bodily sense—as far as colour, at any rate, can do so, he is protected from that—but in that extreme boldness and familiarity, amounting almost—and some would say quite—to a vice, which has come to be a birthright of the last-named species. I do not believe that this was always inherent in the bird’s nature. In so far as his habitat lies beyond our proximity, he retains—who can doubt it?—the wild graces which belong to the tree- and the rock sparrow. The vulgar taint has been doubtless induced by a too

Plate 9
Greenfinches
By A. W. Seaby

A. W. SEABY

near approach to civilised human-kind, and it is in the same way, in my opinion, that the greenfinch also stands in danger of acquiring it. If it be asked—and it is a question which the evolutionist always should ask—by what path, I reply by that of the shrubberies. Except the sparrow itself, I never knew a bird more fond of them, and it is through this insidious snare, by which, as I believe, the sparrow fell, that he too, I fear me, will fall.

For it brings him near the house, to the very walls of it sometimes—nay, into almost actual contact with the kitchen and scullery premises, which are not seldom guarded in this way—and here he habitually builds. With the windows open and the young in the nest, what can be expected? From here to the pipes and gutters, the housetop, and ultimately to the very front door, and under the drawing-room windows, is a "*facilis descensus Averni*."

Up to the present, however—and may it always be so!—things have not gone quite so badly, and it augurs well that some of the more picturesque habits which the bird has brought with it from the larger life of the fields, into the cramped air and confined space of gardens, have not yet become obsolete. If it can preserve *them*, it may perhaps preserve itself—morally I would be understood to mean. Such a one is the pleasing way in which, as the year wanes, these birds, when returning in small bands to roost, will wheel, a little, in undulating flight above the dark place, before descending into it. The air itself is dark, by this time, but it is light against the opaque blackness amidst which you stand, and look up at them. A few circles, and, with a little scurry, they are in, and, for some moments, the place is full of sounds—fluttering and rushing ones, with the harsh, overwhelming chirpings of more prosaically-entering, or roused-up, sparrows, and perhaps the loud "mik, mik-kings" of one or two half-civilised blackbirds. Then the voices sink, the gloom deepens, and darkly they all creep to bed. This, then, is one pleasing trait—though it be born out of darkness and winter—that the greenfinch brings with him even into our near proximity.

In the spring or summer time the male has another, but it should not be looked for in shrubberies. Perched, now, amidst the high boughs of some whispering elm or poplar in an upright, bold attitude, as his custom is, he will, from time to time, divert himself (but not egotistically) by flying about its summit, singing the while, till, from this high bower of minstrelsy, he mounts, of a sudden, to a still prouder height, obliquely, and flapping his wings with such force, as he does so, that, both above and below him, their tips touch, or try to—you would think, were it cold (as it may be), that he was trying to warm himself. After this bizarre fashion he will describe a circle or two, and then, sinking—singing ever—alight, to rest, for a little, either in the tree-top he has mounted from, or else in some neighbouring one, from whence, in due time and in like manner, he will return. The song thus out-welling is pleasing enough—thin, but so would the sounds of elementals be—light as themselves—and so, and with something of such imagined charm, fall these. Trilled forth by that small feathered atom, he seems rather to be flying amongst them than to have any part in their birth.

Very different are the sounds thus emitted to some others that the bird has, when, seated lower and nearer, he will, time after time, with monotonous regularity, give vent to a long, deep, uncomfortable note that seems to come squeezed out of him, like some painful but positive duty. I have often tried to interpret the expression in this sound, as gauged by my mere human ears, and my valuation of it is always the same. It sounds to me as though the bird were shocked at something—that and something else quite elusive. This depressing performance is usually described as a scream—I call it the Grundy (and something else) note—but the indefinability hardly redeems it. I am aware that, between the pauses of his scandalisation, the greenfinch is supposed to sing—a low trill is especially spoken of. It may be so, but personally I have waited—I have had to wait sometimes—for hours, and during all that time the bird

has been steadily shocked at me—with others perhaps he would have trilled.

I have said that the above diversion of the male greenfinch (the penultimate one, I mean, in the air) was not egotistical. I now make good my words by stating that it is nuptial—a combined display of that kind both to eye and ear, in which not only must the beauties of the yellow-green breast, as the bird mounts and descends, be made clear to the up-glancing hen, but the lighter and still brighter yellow—almost of a citron hue—bordering the wings upon their upper surface, must also, when thus flashed rapidly downwards, be strikingly recommended to her kindly consideration. But there is not only the charm of colour here, as well as of music, but also that of the flight itself; and in the beauty, or strangeness, of this, one would have a sufficient reason for such a performance, were the greenfinch no brighter than the lark. Indeed in the skylark's soaring—too high surely even for a bird to see well—we have, very probably, the ultimate expansion of the nuptial allurements, become now a joy in itself.

If the single flight-matrimonial of the greenfinch be pretty to witness, the double one of the chaffinch—our little Cœlebs—is more—much more—than this. Here there is nothing of *bizarrierie*, of something which, though enjoyable, is almost uncouth—for the wing and body action of Chloris are open to this charge—but all is beauty, nothing but beauty and grace. Out of some high tree in which they have sat for some time, invisibly, calling to one another, the pair sweep, suddenly, in downward flight, pressed, at times, almost together, so close is the race, and still conversing as they sink. The effect in this is not gained by the striving for it; the motion, though swift as an arrow, is yet effortless, for the wings are but spread, and the bright little birds swim, as it were, upon them, down the thin waters of the air, with those almost sensuous curves, flexions, slidings, glidings, which so fill, yet never to satiety, the human eye. Nearing the ground, they undulate, for a little, above it, then with

a swift upward, as before with a swift downward, sweep, shoot to their sylvan banks again, and are out of sight.¹

But this, however exquisite, can hardly be called a display; a mutual expansion one may term it, rather, without *arrière-pensée*, and only unconsciously lovely. It is after another fashion that the male, as wooer, plays his own proper rôle. For this he is well fitted. In coloration, the male greenfinch may a little excel him; still he is more varied and his figure daintier—also he wears shoulder-knots, which Chloris does not. This last, perhaps, is the root of the matter with those most concerned in it; yet still Cœlebs' breast, if not resplendent, is quite satisfactory, so that, his carriage being less upright than is that of some others of the family—Pyrrhula, for instance, as well as Chloris—it has interested me to see him dilating on this theme, to the female, from a spray something above her, in the hawthorn where both were domiciled. She must thus have had a very fine view of it, nor did the snow-white, gleaming patches on the wings, before alluded to, suffer in the least, they being made to play a part even beyond that of the other.

Shoulder-knots indeed (for such I call them) are the chaffinch's chief glory, and were they to fall out of fashion he would be quite lost. His method with them is a little to expand the wings, by which they become fuller, bending, as he does so, if his position make it advisable, both forward and downward, singing all the while most vociferously, moving his wings, expanding his tail, and twitching and jerking himself about in such a tense, high-wrought state of excitement, that he may almost be said to dance upon the spray. These patches, in fact, are very fine ornaments, and, though only white, are so bright and glancing that they look almost like silver, sometimes, when the sun shines on them. Sometimes too they are so large, and the feathers forming them so thick and matlike, that, when thus displayed, they have the appearance of two oval, or almost round, bosses, projecting noticeably beyond the general surface of the plumage. But there are

¹ See Witchell's interesting observations, recorded in the *Zoologist* for May 1898.

birds and birds, in this respect, and I have been so struck with individuals, especially one who looked as though two very large flakes of snow had fallen symmetrically upon him (it was May, indeed, and East Anglia, yet not snowing), that I believe, in some cases, shoulder-knots—as has happened before,¹ and like other such rages—must be carried to an extreme.

But if the shoulder-knots of the chaffinch are worth the showing, those of the goldfinch, being what his name implies them to be—not silver, merely, but gold—are even more so. With him too they are his chief glory, even surpassing, in the effect they produce, that rich small patch of crimson-lake that burns upon his forehead, cheeks, and throat—that little hood, or half-hood, it looks like, through which the front part of the face is so almost comically thrust—for, indeed, the bird seems rather to have put it on separately than to wear it as part of his own feathering; it is so sharply defined, and goes such a little way back, that the eye—the human eye—almost misses something, almost cries out for more. This perhaps—and it may be here remarked that the very theory of gradually increasing adornment, in the male bird, frees us from the necessity of thinking each successive stage of it perfect—gives the preference to the rich, sunny sheen of the wings, with which view the bird's own actions, when he woos the hen, seem to accord;² for, standing before her, with wings a little spread—on the large, high bough of an elm, perhaps, and here the pair may make their nest—he alternately flashes in her admiring eyes first one and then another of these golden lures, turning himself, to do it, from side to side, so swiftly that he seems rather to sway than to bend, till, coming nearer, and growing more and more excited, with glint on glint he makes the air an aureole about her, and almost sets his Danaë in a shower of gold. And so she yields, assuming always that there is no obstacle, and that the pliant hour has been taken, for with finches too—even with goldfinches—it is not always that the

¹ See Swift: "This fellow has no soul, where are his shoulder-knots?"

² Jenner Weir, as referred to by Darwin in the *Descent of Man*.

course of true love runs smooth; and should a more richly-tinted suitor appear, it is quite possible (or even likely) that his shower will prevail. But this is a risk from which, by the very principle of sexual selection, no male is exempt. Beginning with the first dawn of appreciative perception on the part of the female, the law travels right upwards; and perhaps one of the greatest pleasures to be derived from the observation of these simple little bird-courtships is that we may often see in them the germ, or symbolic forecast, of those far higher ones that take place amongst ourselves.

The above-described courtship of *Carduelis* is, perhaps, the most remarkable performance of the kind, practised by any of our British finches,¹ and here I would draw attention to a feature which so many of the *Fringillinae* possess in common, that, whether distinctive or not, it may fairly be called a family one. I allude to the combination of vocal and artistic charms by which the males of the various species are accustomed to win the affections of their respective hens. It has for long passed as an axiom that these two means of attraction are not to be found united in a high or an equal degree, yet such examples to the contrary as the king bird of paradise, who has a "beautiful, melodious, warbling song, enchanting to hear,"² and the lyre bird—praised almost as enthusiastically by Australians for its music, as it is shot by them for its tail—would of themselves be sufficient, even if they stood alone, to show that there is no necessary antagonism between the one and the other.

Probably the reverse is the case, for since even the dullest-coloured birds are attracted and made happy both by the appearance and voice of their mates—as how should they not be?—there seems no reason why both should not have been improved simultaneously, as making up, between them, the personal charm. Rightly considered, there is amongst birds more equality, in the same individual, of song

¹ "Mr. Weir informs me that no other British finch turns thus from side to side during his courtship, not even the closely allied male siskin, for he would not thus add to his beauty."—*Descent of Man*, vol. ii. p. 105, 1888.

² See *Ibis* for 1907, pp. 227-8.

Plate 10

Tree-sparrow building its Nest (*see Plate V*)

By Alfred Priest

Two cock House-sparrows courting a hen

By Winifred Austen

and adornment than of any other two attributes, altogether distinct from one another, as, for instance, those of flight, running, climbing, swimming, etc., in more than one of which no bird excels; or, rather, the combination of the first two is not so much an exception as a law that is often in abeyance. The Finches, as it appears to me, illustrate this law upon a moderate plane, and if, by establishing this, I can make them in any degree instrumental to the dissipation of a fallacy which has run through both hemispheres, I shall have done the world and them some service—how much it is not for me to say.

This, I think, should be easy, for if the greenfinch sings only sufficiently well, let us say, to make him just a singer, is he not equally, by his plumage, just a pretty bird? and if the goldfinch be a very pretty one—for looking to the “Class Aves,” as a whole, one dare not claim more for him—is not his song superior, almost, if not quite, in the same degree? Then, descending, we have the twite, who, in this connection, may be instructively opposed to the linnet. The song of the male is undeniably inferior, and so, too, is his special adornment, the rosy flush above the tail. Yet both he possesses, and both, to the same end, he uses. The first he ekes out, as it were, with an attractive upward flight and descent,¹ whilst to show the last to advantage, he will, time after time, both open and depress the wings,² by which it is not only seen to the full, but with an added charm—for the spread wing is ever a beauty. In the sparrow, again—*Domesticus*, I mean, he of notoriety; his uncorrupted cousin, *Montanus*, may top him “by the altitude of a *chopine*”—we have a basic example of the same thing. True, he cannot properly be said to possess either vocal or bodily attractions, but since he thinks he has both, and acts on that conviction, he stands essentially on the same footing—indeed offers a good illustration of the principle under examination. With drooped wings, and actions in which an attempt to look sentimental seems to struggle with the habitual self-satisfaction and air of vulgar import-

¹ Macpherson and Harvie-Brown, *Fauna of N.-W. Scotland*.

² T. A. Coward and C. Oldham, *Birds of Cheshire*.

ance which is natural to him, he will hop (or several may thus hop) about the hen, at whose hands or, rather, at whose beak, he often, for his pains, receives the most cruel and, apparently, inappreciative treatment; for she will dart upon him and peck him, not merely for a peck or two, but continuously and for minutes at a time—so, at least, it has seemed to me, whilst to the bird itself it may well have appeared longer. Still he is able to recommend himself, and he does so by methods essentially the same, if not so developed and elaborate, as those which the goldfinch, the linnet, or the bullfinch employ. For instance, he wears, and is justly proud of, a black cravat. It is his one striking point, and he would be mad to neglect it. Nor does he, but, standing before her, and throwing his head upwards, so that she cannot escape it, he seems often, like Beau Brummel, whom at such times he greatly resembles, to bid her “look—and die!”

To some it may seem that, in our last-named example, the bullfinch, that correspondence which has been postulated between the degree of beauty and of vocal excellence is not quite so close; that, on the one hand, he is more showy than his song, whilst, on the other, those sweet flute-notes, so soft, so low, and yet so woodland-wild, issue from a form a little too full, too rounded—too fat, if one must say so—for perfect poetic appropriateness. But, in the first place, this has been so, and still is, with many of our most celebrated singers—tenors especially—so that, by mere association of ideas, it should seem to us correct; and then too, even if—which I deny—the form jar slightly—no, not that, it cannot do that!—but if it seem, to some, not quite absolutely in consonance, is there not the colour also to be considered? and *that*——! There is something—so it seems to me—in that exquisite, soft, blood-peach bloom of one whole half of the bird, that exactly tallies with those soul-drawing notes. These, by the way, are not the song, technically so-called, but only the call or talking notes, those sweet and low—so low that one must be near to hear them—“dee-ew, dee-ews,” followed by their still softer and lower “dee-it, dee-its”; but if a bird be musical,

not only in its song but in its conversation also, should not that be reckoned in with it?

Many, it is true—perhaps most—will think that the prelude here, as it may at any time become, is superior to the actual symphony, and in regard to the point under consideration, opinions must a good deal depend on whether the artistic or musical craving is most strongly developed in the soul of the listener, who, however—a combination not always easy here—should contrive to be a see-er also. But be this as it may, few will dispute that Pyrrhula, in his person—his full masculine person I would say—is an honour to the Finch family. Were he only as the female is, still he would be a sightly bird, but being *as* he is, who shall describe him? Luckily there is no need to, for though not, in England, as common as one could wish—not like the chaffinch or greenfinch—still, but once seen he is not to be forgotten, and there is hardly a fruit-grower in the country who has not been favoured, at least to this extent, whilst on most the privilege has been bestowed with a less jejune hand.

The grand feature is, of course, the breast, or rather the whole under surface, as well as the sides of the body, with a charming upper encroachment almost into the region of the nape, and of this splendid development nothing that would not do it wrong can be said, except this, that it is the work of a great colourist. Nor can any one be in error as to the *motif* of the thing, its true meaning. To see it is to know, at once, what the bird does with it. No more than if Mr. Pepys were to stand before us in one of his new “Jackanape coats” (“cost me twenty pounds” or so), can we doubt on what point, in this wooing, the stress will be laid. The attack *must* be frontal—and it is.¹ Yet not exclusively so; to a certain extent it may be said to be from the rear also, for whilst the soft feathers of that incomparable façade, in whose very quality there is something, even when they lie close and sleek, as they sometimes do, which suggests puffiness, are puffed now to the very limit of this capacity—increasing, almost

¹ See Jenner Weir, as referred to by Darwin in the *Descent of Man*.

indefinitely, the sunset area—the black tail, brought round with strenuous motions, presents itself, now upon the one flank, now the other,¹ like the homelier relief action in a drama whose almost too powerful interest might, if untempered, keep the spirits too much at a tension. Of course the velvet of the smooth round head plays here its part, also, and the same is the case with the fiery forehead of the goldfinch and the chaffinch's little blue crown.

For the latter bird, his little simple roundelay, trolled out so constantly through the spring and livelong summer day, that the country, at that time, would hardly seem the country without it, is fairly on a par, perhaps, with his more moderate degree of adornment, and, as we have seen, he is equally anxious to do justice to both. It is the same with the other members of the family—the crossbill, grosbeak, siskin, twite, linnet, brambling, and the rest. All these birds have, in varying degrees, adornments which they make good use of, all have a song, and in most, if not all of them, there is some rough correspondence between the extent to which both are developed in the same species.

This is the case with the two first-named, who both sing melodiously,² with the brambling, who, under proper conditions, does also,³ with the siskin, who is both less adorned and less musical, with the twite, to whom this applies on a still lower plane, and pre-eminently—upwards again—with the linnet.⁴ For the song of the latter, he confessedly excels in it all other of our finches, but I also acclaim him the most beautiful, for there is something in that Lucrece breast of his, which, for me, strikes a higher note than anything in the more extended and worked-up adornments of either the goldfinch or bullfinch. It is hard indeed—there is something like inconstancy, with remorse, about it—to have to give up the breast of the latter, having but just praised it so warmly; but I cannot help preferring the colour of the linnet's, and,

¹ See Jenner Weir, as referred to by Darwin in the *Descent of Man*.

² For the grosbeak see Naumann, *Naturgeschichte der Vögel Mitteleuropas*, iii.

³ Collett, as quoted in Sharpe and Dresser's *Birds of Europe*.

⁴ Naumann, *op. cit.*

Plate 11

Cock Linnet in summer plumage (upper bird) and hen

By A. W. Seaby

for the rest, the masterly way in which it is dashed in, and its coming, as it were, out of nothing, pleases me more. It is not such a finished, or seeming-finished, performance—for here, perhaps, we have the *summa ars* of nature—but it is freer, less studied, and so more artistically effective. The way it begins is beautiful, and so is the way it ends—those tragic stains full of dramatic suggestiveness! It surprises one too—I give but my field impressions—even when one most looks for it, for, not only in the bird's quiet colouring, otherwise, but in his ways and actions, careless, as they are, and unstudied, there is nothing that leads up to or ushers it in, which makes that when it does come—full, in some careless turn or poise—it never comes tamely, but as though it had leapt from the dark. True, there is the blood-red forehead also, and the shafts of white light in the tail, but for the last to flash out, the tail must be fanned; and, withal, the bird is but little, and, from only the least distance, looks as sober and unpronounced as many a duller one—as a hedge-sparrow, sometimes, almost—till, all in a moment, that breast—like a wound—bursts upon one.

One may envy the hen linnet, that has a breast like this carefully shown her—for here there is nothing unstudied—but I was once, myself, all undesignedly, almost as highly favoured; indeed, for the time it lasted, which was by much too short, I doubt if ever a hen of them all had a finer (I do not say a closer) view. It was one of those lonely little pools—ponds, tarns—I know not which to call them—that in Suffolk often surprise one, suddenly, in the middle of a ploughed field or other such agricultural surroundings, as unpeopled, very often, as the desert itself. This one, where it happened, was deep set in the ground, almost circular, a steep brushwood bank running up from it, topped with young elms, still slender, but tall in their degree, the two together shutting out, as though it could never have existed, the more familiar little world around—a place of stillness, of absolute peace and forgetting, with a disc of late sunlight on the dark water, decked, from shore to shore, with delicate,

bronze-hued leaves that looked like those of a small water-lily—there I was watching. The greenfinch had drunk there, and so had the pheasant, and the thrush still stood, silently, within a hop's length, though *he* had come for a water-snail. Then he drew a little back, for a moment, half startled at a small rushing sound, as, out of the elm-tops and right into the still-lying sunshine, a bird, like a meteor, shot impetuously down, and then up, and then down again, with a pendulum swing, going from one side to another, in a series of bold, sweeping dashes, each one like a ray of blood. The last reached the water, and there, in its very centre, poised on a lily-leaf, the bird stood, his magnificent breast flashing and kindling in the sun, and drank daintily. One greenfinch—whom he seemed to disdain—was drinking there too, not far from him, his body partly submerged in the water—half frightened at his own boldness—but the daintier weight of the linnet scarce wetted him whilst he sipped. That was a picture—and the thrush now was banging his water-snail.

Everything that the linnet does he does daintily. Even feeding, which is a gross thing in itself, is not so with him. You may see him in the spring-time, sometimes, when daisies are about, stretching up and bending over one of them, to crop its golden crown, and his partner, the hen, will fly up beside him, to share the poetical meal. There is no more pretty conjugal scene, but that breast of the male is almost too much, sometimes, for it seems to be bleeding. It is not like the redbreast's, who never has moved me so, but right blood, to my fancy, and splotched upon the feathers as if it were welling out of them.

Since, however, it has not been acquired in that way, how has it been?—and how has that of the male bullfinch, greenfinch, chaffinch, with their plumage generally, the crossbill's too, and the gold and red cap of the goldfinch—the question comprises all of them—how have they all been acquired? Protective amalgamation with the general hues of the landscape is here excluded, even for the extreme modern exponents of that view, for not only, were it valid,

should the females be brighter, instead of duller, than the males—since they more need protection—but the very males themselves are hardly bright enough to satisfy *them*; the parrot tribe, in which neither of these drawbacks obtain, and, of these, the macaws, more especially—the scarlet one, say, *Ara macao* for choice—would reward their ingenuity better.

The next-favoured hypothesis is that of superior vitality in the male, leading to the acquisition by him alone of colour, frills, lappets, etc., at that period especially when vital energy is most required in the cock bird, whilst the hen, who needs but little for egg-laying, nest-building, and care of the young, remains unaffected—in youth, that is to say. In age, having lost the capacity for these things, and become more vigorous in consequence, she may sometimes (as noticed by Darwin) assume the attributes of the male to a minor degree—striking collateral testimony to the truth of the main proposition!

Accepted frankly, this theory is incidentally useful, as giving us a sure insight into comparative bird psychology and temperament, for since, according to it, the more vigorous the males of any species are, the brighter they glow, we see at once that the cock bullfinch, for instance, whatever the hen may be, is a much brisker bird, not only than the sparrow, but even than the sparrow-hawk and others of the Accipitres, or than the swift, swallow, martin, etc., which we should never have found out had we been forced to rely on our own unaided observation. If, indeed, we allow ourselves to be guided by this, as well as by common knowledge, it becomes apparent that the world is full of extremely vigorous birds that are dull, and much less vigorous ones that are brightly coloured; but these we are at liberty to account for as exceptions to a rule which, in accordance with a well-known axiom, they thus help to prove.

But if still unsatisfied, we are then driven back upon the generally unpopular doctrine of sexual selection, which, though it has every possible evidence of fact in its favour—even to that of the process

having, upon various occasions, been actually seen¹—is as strongly at variance with certain dogmas and presuppositions to which a value still more decisive than that of evidence has, for long, been accorded. The difficulty has always lain with the hen bird, who, by admiring, as the theory said she did, something that only man could be held sufficiently æsthetic to appreciate, interfered with his monopoly of a certain high spiritual faculty, and thus gave a deep dig at his pride. For the cock, there could be no doubt that he did thus exhibit himself before the hen, and since vanity was a spiritual faculty which man was willing to share with his inferiors, less difficulty was experienced in admitting that *he* might, upon such occasions, feel something as we do when we act in a similar fashion. The thing was winked at; but when it came to the hen's appreciating his beauty, to the extent, even, of choosing him for it, here was a different matter. If so, then she shared an æsthetic sense with man, who alone, it was held, was privileged to admire, let us say, a male Argus-pheasant, though to no one, except to a female Argus-pheasant, had proper facilities for doing so been given. Still, clearly, the thing was impossible, and though the facts before mentioned were not in dispute, a more reasonable explanation of them was held to be that cock birds, all the world over, were mistaken in their estimate of hen birds,² and so, misled by vanity, went through a variety of most remarkable performances, all clearly designed to further their wishes, but which did them no good whatever. No matter what the cock did, or what *he* thought. If only the hen were indifferent all would be well, and so, since the sole possession of an æsthetic sense by man was not a claim to be lightly surrendered,

¹ I have myself witnessed it in the case of several species, including especially the ruff and blackcock. See my papers, "Observations tending to throw light on the Theory of Sexual Selection, etc.," in *The Zoologist* for June, August, and November 1906, and February, May, and October 1907, and "An Observational Diary on the Nuptial Habits of the Blackcock in Scandinavia and England" in the same for November 1909, January and February 1910, etc.

² A delusion shared, as is now known, by male spiders, who dance before the female to her *most evident* satisfaction, and, to demonstration, thus win her. See the famous paper by Professor and Mrs. Peckham, as also remarks thereon by Professor Poulton, in *The Colours of Animals* (International Scientific Series). The title and bibliographical of said paper will here be found. It should be read in full by all evidentially interested, but not more so than my own papers referred to on p. 52.

indifferent, in despite of Darwin and common sense, she was held to be.

Whether she really is, however, should be, as I hold—without disrespect to either of those two great names—a matter for every man's—at least for every ornithologist's—field observation; and, for my own part, since I have seen her, on various occasions, very much other than indifferent—to the extent of watching battles urged on her account, assaulting one or other of the single combatants, driving off third-comers, and choosing, in the plainest way, males that she as plainly preferred¹—I hold her to be only so, occasionally, and as even women sometimes unaccountably are, in the presence of masculine pose and charm. In fact, I know her to be impressionable, though capricious, and sometimes cold, and so, since I am not at all smitten with what I call man- or Yahoo-pride, and am of opinion, moreover, that, even if the hen bird had an entire want of the æsthetic sense, she would share *that* almost as much with us as I think she does its possession, I explain all these doings and wooings and plumatic or other adornments, whether of finches or other birds, as due to the agency of sexual selection, which appears to me to be as well made out as natural selection itself, and a very great deal better than either warning coloration or recognition marks. If it has had to wait thus long for acceptance, it is because it attacks that last stronghold of man's self-worship—now that the body has gone—the mind. That a bird should admire! That a butterfly should be tickled as we are!

Nuptial display, either vocal or ornamental, is, of course, in finches as in birds generally, the prelude to nesting and general domestic activities, and in our pleasant little lesser redpoll—*Linota rufescens*—we can point—that is to say, we might once have pointed—to one of the family, at any rate, belonging to this country, who, in the opinion of at least one ornithologist of repute, does—that is, did—us the distinguished honour of breeding nowhere else. He is also—this

¹ See footnote 1, p. 104.

at least is established—the smallest of our finches, so that his claim to our regard and interest is—or was—twofold, though in what two ways the debt has ever been paid, other than through the twin ambition to possess both his skin and his eggs, I have yet to learn. It has even been thought by some that this diminutive species, the eleventh smallest on our list, is distinctively British, in the way that the red grouse is so; but this view was happily abandoned before there had been time for extermination to follow upon it, as it otherwise most certainly would have done, seeing that the lesser redpoll is not a game bird.¹ And now, too, the old opinion in regard to this little bird's peculiar love of our island must either be held to have been erroneous, or else it has shaken off its insular prejudices and become cosmopolitan. It has now, for some time, been domestically established, by Dr. Hartert and others, both in West and Central Europe, and Dr. Hartert, moreover—though in this he stands opposed to both Tschusi and Deichler—declares that British and continental specimens are indistinguishable. May this point not be tested by a few hundred thousand comparisons! ²

In spite of the merits, real or imagined, of the lesser-redpoll, his cousin *Linaria*, the mealy-redpoll (so named, we are told, from a certain farinaceous appearance of the plumage), is perhaps the more interesting bird of the two, partly by reason of his more linnet-like breast and richer “poll,” but more on account of his tit-like activity amidst the tops of trees, and free, bold flight, many together, the call-notes uttered, as the linnet's are, on the wing—in fine, by a certain charm of manner, a wild way which he brings with him from the north. These latter traits link him, yet subtly, to the siskin also, who comes mostly, like himself, in the winter, and whose entertaining, or most entertaining, springtide activity, as performed by the male, is but seldom seen in this country. For mounting, with blythe song, from the summit of some

¹ The red grouse, of course, is, to which fact it owes its preservation.

² This is not said without warrant—even recent warrant. I protest against certain pedantic slaughters to which our birds—a part of the national wealth of the country—may, in spite of the law, be exposed.

Plate 12

Lesser-redpolls (three upper birds) and Siskins (two lower yellow-green birds)

By A. W. Seaby

dark or snow-clad pine-tree in the forests where these birds love to build, he circles a little above it, smiting his wings above his back, and then, with fanned tail and swelled plumage, sinks slowly down again to where the hen sits admiring. This, it will be seen, is a very similar exhibition to that of the greenfinch, yet, as probably in all such cases, there are marked points of difference between the two, the latter bird endeavouring with success to make itself *outré* by a novel method of flight, whilst the former achieves the same result both through this and the additional (or perhaps more pronounced) expedient of dilating the plumage, which gives it a curious puffy appearance that shows strangely in the air.

Mere shadow of the redpolls, a vanishing gleam of the linnet, the twite is a bird which, in his building proclivities, really does show a marked preference for the British Isles, since, with the exception of some others, less famous in history, off the west coast of Norway, and, more sparingly, the adjacent mainland, with now and then a honeymoon in Sweden or North Russia, he would seem to breed nowhere else. The locality, however, must be suitable, by which he understands moors, heaths, and such like desolate, wild places, owing to which isolation his clutches, as I would fain hope, often escape those of the collector, however scientific; nor was it, indeed, till towards the end of the seventeenth century that he himself, even, was, most unfortunately, discovered, and booked as a British species. For his own sake—and mine—I could wish that he still lived *incognito*, or that, since he must be so restricted, he had chosen some comfortable spot in the Desert of Sahara or at the North or South Pole, from whence, his non-British-laid eggs having performed their true function, he might, with comparative safety, have repaired to us during the later months of the year.

However, he breeds with us, in which connection may be mentioned a curious habit which this bird seems, in some parts of England, to have acquired, of decorating his somewhat rude nest with one or, at most, with two feathers, being usually the hackle feathers of the

cock. Whence comes this odd fancy? A feather loosely stuck into the outside of it (as I gather) can answer no purpose in the construction of the nest, so that we seem almost compelled to attribute its *persistent* presence there to that æsthetic feeling which, however it may be denied, some birds do most certainly possess. I have myself seen the nest of the more ornate cormorant, or shag, gay with the flowers of the forget-me-not, whilst others had pieces of bleached spar sticking out from them, presenting a clean, white appearance, which might have pleased the eye of a savage, as well as a bird,¹ but as useless, otherwise, as the twite's one or two feathers. In this latter case, especially, the limitation of the number thus used is an evidence, as it seems to me, of the nature of the impulse at work. Were the object *here* structural, more would probably be required and used, but it is conceivable that one only, or a couple, might be sufficient to satisfy the bird's æsthetic needs, just as one plume or one carcass on her head will sometimes glut those of a woman.

The statement on which the above remarks are founded is (with my own underlinings) as follows:—"One day," says Mr. W. H. Parker, in the *Zoologist* of November 1905, "my son and I found six nests. Every one of these nests had the *conspicuous* feather (occasionally two) *that we Bradfordians have noted so frequently*, when photographing the nest, *so that we expect always to find this odd adornment*." On another day: "We found No. 1, and after a careful examination could not find even the odd feather; again we find another, not a feather in it, another surprise. This, too, when *we had almost come to believe that, as far as our own district colony was concerned, twites never built without this adornment*. Only a few days later *and every nest found contained a feather (or feathers)*, mostly the hackle feathers of the farm-yard rooster." To some it may appear that I am making too much of the matter, but I do not myself think so. Nothing, to my mind, is so interesting or, from the point of view of origin, so important, as the

¹ See *Bird Watching*, pp. 174-5. The skeleton of a puffin, partly bleached, yet with the feathers of the wings still adhering, had also been thus made use of, and is perhaps still more "convincing."

Plate 13

Twite and its Nest

By G. E. Collins

earlier stages in any peculiar, or indeed in any, habit. Who would not be glad to find them in the case of the bower-birds? But when only the advanced stage is known, the origin may be difficult even to conjecture. Therefore the slightest indication should be carefully noted, for it may help to solve problems both of the past and the future. The fact that the twite puts a layer of feathers in its nest, which it then covers with wool, hair, etc., does not appear to me to destroy the value of these Bradford observations. Feathers stuck conspicuously into another part, and suggesting an "odd adornment" to all who see them, are something different. The process would appear to be this—feathers are in use, feathers are decorative; *some* birds appreciate this, and add decoration *to* use. It is not the long step, but the little one, in evolutionary reasoning, that we should be on the watch for—*natura non facit saltum*.

The same æsthetic instinct has been observed in the case of the goldfinch.¹ "They were picking," says Colonel Ward, "from my flower-beds sprigs of the blue forget-me-not, which they immediately carried up to the nest, and used for its adornment."² It may be noted, incidentally, that both birds were doing this. It was the same with the cormorant, and equally a novelty in either case. But the beautiful, soft, sky-like blue, no less than the green and the gold of their own plumage, was admired by each of the architects—and why not? Has not much of the difficulty in these matters been made by the fine word "æsthetic"? What, after all, is it to be pleased with something bright? We do not think much of it in a baby; why should we in a bird?³ Find some short Saxon word for the thing, of the "brute-meaning" type, and all will be well. But admit the rudiment, and I myself can see no reason why a bird should not become more æsthetic, in some special direction, than many a man is, generally. Why should I not think so, seeing that my experience, as a cyclist,

¹ See also Dr. Martin Braess in regard to the decoration of its nest by the starling with violets, hyacinth, narcissus, primrose, etc., *Das heimische Vogelleben*, p. 146.

² *Field*, 1891, lxxviii. 415.

³ The jackdaw—especially he of Rheims—may be considered.

has taught me never to ask any question, when exploring, in regard to the relative beauty of this or that road? Your rustic and your barn-door fowl are alike here.

The house-sparrow is another of our finches who has "ideas" on the subject of nest-building. In trees, which lie open to the weather, he prefers a domed residence, but dispenses, to some extent, with such addition, where the projecting eaves or parapets of buildings supply him at once with a roof.¹ This has been called an intelligent adaptation of habits to changed conditions; but, though it may be so, it seems also possible that the adaptation need not imply much intelligence. In a word, does the sparrow reflect that, having already a dome, he need no longer build one, or, finding that there is one, does he either come to think he has built it, or recognise the fact that it is there? In the one case there would be intelligence, in the other a mere puzzled acquiescence. A sparrow, no doubt, upon finding itself under the dome of its nest would have certain satisfied sensations, assuring it that all was well. Would it not be likely to receive a similar assurance though the dome took the form of a parapet? The darkness, the quietude, the security—all would be there, producing, it seems likely, by association, the actual feeling of having made the nest; but this would not apply to the cold stone flooring before it had been properly wadded. The fact (as it is asserted to be) that, on these occasions, the dome is not entirely, but only partially, dispensed with, is in favour, I think, of the explanation here offered. Did the thought, "There *is* a dome; therefore why build one?" pass through the mind of the bird, we might expect to find none at all built by it, at least in some instances; but the *sensation* of the nest being all that it should be would increase as the building continued, till it became too strong to be resisted, when the work would be abandoned. It seems to me possible, therefore, that this change (which, however, is not universal) may have been brought about rather through the senses than through the intellectual faculties, nor

¹ See Romanes' *Animal Intelligence* (Int. Scient. Series).

is evidence, in my opinion, wanting to show that some actions which have all the appearance of being intelligent, and may even *now* have become so, have had a similar, or even a more purely physical, origin. The subject is interesting, but has been badly neglected.

As the domed nest is no doubt an advance upon the open one, and as no other finch in our islands (if it be not *Passer montanus*) builds in this way, it may be argued that our little homely town brownie stands first as an architect. As an artist, however, all must admit that he is greatly excelled by the chaffinch, whose dainty little cup of moss and lichen—sometimes to be seen in our hedges, more often not to be, in trees—is one of the most beautiful and charming objects produced by any British bird. This most attractive family residence is completed by the hen in the space of three weeks, for though the male attends her when she is thus busied, yet it is only to gaze and admire, or, at most, he will sometimes, though rarely, collect materials to pass into her shaping bill. Harting,¹ at least, and others would thus limit his capacities, but it is to be observed that Naumann² does not entirely corroborate this, but gives some share of the work to the male. He seems to imply—for the meaning is not quite evident—that, in the first enthusiasm of the enterprise, he works with the hen, but that his assistance becomes more and more irregular, till at last he ceases to proffer it, and only sings.

Besides the ordinary moulding and shaping of the material by the pressure of the breast and wings, and the use of the beak, it has been supposed that a firmer adherence of the component parts to one another is secured by the bird's employment of its saliva, in order to cement them together. This is a point on which, perhaps, more evidence is needed, but that spiders' webs are made use of for a similar purpose is matter of common observation.³ The interior of this sweet little snugery is a perfect idyll of cosiness. Wool, soft, yet elastic, supports a smooth—one might almost say a polished—lining

¹ *Birds of Middlesex*.

² *Naturgeschichte der Vögel Mitteleuropas*, iii.

³ Before it had become so, it was recorded by Brehm and Waterton.

of horse-hair, on which a few feathers lie softly curled, like kittens asleep on a bed. Here either the two birds sit, alternately, or only the hen does, or the male but occasionally, or just for a little while, according to authority and the state of their minds.

The brambling's birch-built nest, if not made quite so neatly and delicately as the last, is almost prettier, whilst the materials made use of, drawn from woods higher-lying and wilder than our own, give to it a sort of northern charm and expression. Green mosses, indeed, that we know, or that seem familiar, make the outer woof of it, and are bound with such webbings of spider or caterpillar as the chaffinch uses, but it is starred all over with flat, disc-like pieces of white lichen, which, mingling with strips of peeled birch-bark, also white or of a pale, glaucous hue, give to the whole a silvery appearance, half soft and half shining, like the tree against which it lies pressed. Within there is wool, and, on that, the feathers of the white grouse or ptarmigan, which show above the rim, curling inwards so as almost to "quite over-canopy" the brooding bird.¹ The nest is much larger than that of the chaffinch.² This bird-gem of the north is placed generally in a spruce or birch-tree—if the latter (which seems to be the one preferred³), in the fork where a main branch leaves the trunk, at some ten or twelve feet from the ground.⁴ If the spruce is chosen, both the nest and the visiting birds are more effectively concealed amidst the dark drooping frondage and streaming lichens that hang down like tails from each bough. These latter may become now the chief or even the only building materials employed.⁵ Whether, either by such or other means, the bird consciously endeavours to hide its nest is perhaps a nice point, in connection with which the following interesting habit, which it would appear to have, may be mentioned. "I have noticed," says Collett (author of *Bird Life in Arctic Norway*), "that in the west, where *Corvus cornix* is a

¹ J. Gould, *Birds of Great Britain*.

² E. R. Alton and J. A. Harvie-Brown, quoted in Sharpe and Dresser's *Birds of Europe*.

³ Sharpe and Dresser (*op. cit.*), who quote Gould and F. and P. Godman.

⁴ E. R. Alton and J. A. Harvie-Brown in Sharpe and Dresser, *op. cit.*

⁵ R. Collett, as quoted by Sharpe and Dresser in *op. cit.*

dreaded robber of the eggs and young of small birds, when compelled to leave its nest for food or any other purpose it generally hides the eggs amongst the moss at the bottom of the nest.”¹ Seeing that the moss is beneath the wool and feathers on which the eggs lie, this surely is very remarkable, nor do I know that a similar habit has been observed in any other of our finches.

I may here, however, refer incidentally to an interesting and somewhat similar trait of character which has been observed in the crossbill. “If,” says Keller, “the bird finds itself under observation whilst in the neighbourhood of its nest, it drops suddenly, like a lump of lead, from the tree,² and disappears amidst the underwood. It shortly emerges upon the other side, to repeat the manœuvre if paid further attention to, and, if followed, will lead the intruder farther and farther from its nest, until, satisfied with the success of its stratagem, it mounts aloft and flies back.”³ The account, however, is not perfectly clear. On the other side of *what* does the bird reappear, and from what does it continue to fall when the nesting-tree has been left?

Coming to the goldfinch, his nest too is a most artistic production, less finished, perhaps, and not so exactly shaped outwardly as that of the chaffinch, yet, whilst the interior with its thick mattress of thistle-down, surmounted by a thinner one of horse-hair, on which the bird reposes, is beautifully rounded and of delicate proportions, the more massive foundation which fixes it to the bough, being all or mostly of green moss, whether culled from earth or tree, has a particularly pleasing appearance. From this mossy basis, or pedestal, rises a varied assortment of roots, stems, brown fibres, lichens, and such woodland upholstery, over and about the whole of which pass the grey webs of spiders or the spawnings of caterpillars, giving it a softened and misty appearance. Feathers and thistledown made all snug within. Neat the nest may be, but this is not its best beauty. Conjoined with and

¹ Quoted in Sharpe and Dresser's *Birds of Europe*.

² As I understand from the context.

³ Naumann, *Naturgeschichte der Vögel Mitteleuropas*, iii.

surpassing it there is a sort of careless grace, a wild, woodland charm, something in the nature of that "sweet neglect" which "takes" both eye and heart. "Neglect!" some may cry, but your "sweet neglect" is not that. There is freedom—that is what I mean. Some of the moss of it may hang loose in the air—a wild, an unstudied effect—and yet so dainty withal, one may well ask if aught but the feminine beak could produce it. There is some lack of agreement here. Naumann has but a poor opinion of the goldfinch husband in this respect,¹ but elsewhere he has won golden ones.² Be this as it may, a goldfinch's nest upon its forest bough is a lovely thing to see; nothing can improve it, except the bird when she sits there.

Yet there may be those who prefer the siskin's, or who would do so could they see it, for, shrouded amongst the dark, drooping fir-boughs, with their long, beard-like lichens that fall about and envelop it, this is a difficult matter—so difficult, indeed, that in days when the truths of science had not so much encroached upon the more pleasing realms of fable and fancy, it was sought to explain it by attributing actual invisibility to an object whose existence, since the birds were seen building, could not be denied.

But this theory, though satisfactory up to a certain point, did not cover all the ground. It accounted perfectly for the number of failures to find, but since, after all, a siskin's nest sometimes was found, something else was needed to explain this apparent anomaly. It was therefore surmised that this quality of invisibility was not inherent in the nest itself, but must be conferred upon it, as it were, by a certain stone (not more wonderful, after all, than the philosopher's) which the siskin was accustomed to place in it, and that when, either through indifference, or such stones being not very common, it failed to do so, it had then to run the risk of discovery. Even so, the nest might often escape detection through mere natural concealment, as did those of so many other birds, but it was undeniable that such as were

¹ Still he implies that *some* work is done by him. Sharpe and Dresser (*op. cit.*) say the female only works at the nest.

² Such, at least, is my impression.

found had, invariably, no stone inside them. Thus all the facts were accounted for, but in spite of this very great merit in an hypothesis—not the less uncommon because indispensable—this ancient one of the siskin-stone has been constantly losing ground, and it is now a very long time since any ornithologist of standing has declared himself unreservedly in its favour. It has been succeeded by that of protective assimilation, since not only is the nest of the siskin, a small object, sheltered by its immediate surroundings, but the materials of which it is built are largely composed of them. Thus the first layer or foundation is composed of such thin, lichen-grown twigs as sway about it, whilst the long, beard- or tail-like growths which festoon every bough are the principal stores of the second. Some nests, indeed, are almost wholly composed of such lichens, both without and within, even to the exclusion of the usual layer of vegetable wool, mixed with feathers,¹ but this is far from common. All these things and some others, including spiders' webs, play their part in the average specimens, the general appearance, when completed, being something like that of a miniature goldfinch's nest, which, of course, is high praise.

The greenfinch and linnet have much alike in their architecture,² except that the former, being a larger bird, builds a larger nest. Coarsely woven on the outside, the interior fabric is finer, and the cup being well shaped, it may pass, on the whole, as a neatly made structure, though with some slovenly exceptions. In the matter of situation, the bird is not nice. Tree, bush, and hedgerow are equally affected by him,³ but his highest instincts are, perhaps, satisfied by an evergreen in a shrubbery. As for the linnet, he prefers a bush—especially a furze-bush—but trees are not disdained by him, and nests on the ground are frequent, or even habitual in certain localities.⁴

¹ Naumann, *Naturgeschichte der Vögel Mitteleuropas*, iii. See also the similar statement of Collett in regard to the brambling's nest (*ante*, p. 112).

² Naumann, *op. cit.*, iii. Naumann seems to have been much impressed with this resemblance, whilst others, as so often happens, can't understand how he could have been.

³ See *ante*, "Classified Notes," p. 65.

⁴ See Naumann, *op. cit.*, iii. Naumann himself declares that the bird's choice of a site is extraordinarily varied. He gives more botanical examples than my German can keep pace with, and adds to them, as something more exceptional, the straw thatch of cottages, etc.

Rustic amongst things rustic, the twig-woven, moss-padded nest of the bullfinch is a pleasing object for the eye to dwell upon, even exteriorly. The cup, with its fibrous and hirsute lining, on which a feather or two may lie lightly, is still more so—one envies the bird that sits there. 'Tis a sweet sylvan home. There may not be riches, but there is rural abundance. Wool is not an unknown luxury, and a few leaves, even, may add a refining touch to the edifice,¹ which is crowned with content—at least I never heard word to the contrary.

Both the redpolls build well, if somewhat roughly. The nest of *Linaria* is commonly placed in the fork of a birch-tree, like that of the brambling, and at about the same height, but also amongst brushwood, where it may be but a foot from the ground. It is cup-shaped. Moss, lichen, and grass-stalks enter into its outer texture, enclosing, within, the feathers of the ptarmigan, and soft, woolly down of the willow.² Similarly situated, and in much the same style of architecture, the smaller nest of *Rufescens* has a still more elegant appearance, as well as the added charm of being built, yearly, upon British soil—a fact not always to the poor bird's advantage.

For the twite, no one, in my opinion, should presume to speak of its nest—or rather of its nest-building—otherwise than by quoting from Dr. Saxby's account³ of a pair which he watched whilst thus engaged—unless indeed he should himself have similar credentials, which is not my own case. "One very favourite situation for the nest," says Dr. Saxby (speaking in regard to the Shetlands), "is under a long strip of turf which has been nearly reversed by the plough. In such a situation I once found the commencement of a nest, and derived much interest from watching the progress of the work. When one of the birds disclosed to me the site chosen for its future habitation, by flying out, I could perceive nothing more than a slight hollow which had been scraped beneath the turf, and although

¹ Sharpe and Dresser, *Birds of Europe*.

² Collett. See Sharpe and Dresser, *Birds of Europe*.

³ This account has a general interest beyond that which relates to the species in question. Nidification is a very interesting process, but there are not many records of it.

I frequently visited the spot in the course of the day, nothing more was seen of the bird until about twenty-four hours afterwards, when the pair began placing a number of fibrous roots in front, in the form of a half-circle, the back part of the cavity being left untouched. In a few hours' time some stalks of plants were added, and from four o'clock in the afternoon until noon next day the birds disappeared. They next laid the foundation of the other half of the circle, continuing steadily at their task until the structure was equal in height all round. They now appeared more eager to proceed, working so diligently that, by the evening of the fourth day, the mass of roots, grass, and stalks of plants formed a perfectly circular wall, an inch and a half in height, and about two inches in thickness, somewhat loose and irregular upon the outside, but with the inside neatly interwoven, and sloping rather suddenly to the bare patch of ground enclosed. On the morning of the fifth day, I observed a few feathers upon the ground in the centre, and the number rapidly increased until the sides were covered more than half-way towards the brim; in the evening the feathers were almost concealed by a quantity of cow's hair, among which a little wool was intermingled. More work was done that day than any other." Dr. Saxby strewed some rabbit's fur about, and continues: "Although it was soon discovered, the birds were not quite contented, using it rather sparingly, and working it into a felt-like mass, with wool, and the hair of cows and ponies. This process appeared to be one of difficulty and to require great care, for it was not before the evening of the eighth day that the task was completed, the brim of the cavity being by that time neatly finished off with a few long black horse-hairs, and measuring exactly $2\frac{1}{4}$ inches in diameter."¹ In another nest which was found by Dr. Saxby, "a layer of curved white duck's feathers" was also covered up under "a thick layer of wool, intermixed with hair of cows and ponies."²

¹ *Birds of Shetland*.

² *Ibid.* Thus the fact of some twites sticking a feather or two conspicuously in the nest does not lose interest, and if it occur with any frequency (as near Bradford it does) must be due to more than chance.

The characteristic cup in a twig-tray, as one may call it, in which the brooding hawfinch sits, is, as the work of a finch, a large structure, yet, as might be expected by ornithological students of character, so well is it concealed, withal, that the maker itself is perhaps less elusive. The site is, by preference, an orchard or aloof-standing forest tree—beneath, or rather above a substantial bough of which, it modestly hides itself from the gaze of terrestrial seekers—in which assurance, or strong hope, of safety, I, with complacency, leave it.

Were it not for its greater size, the nest of the crossbill would be as invisible as that of the siskin, being built of similar materials, and concealed in much the same way. Placed, in the majority of cases, near the summit of some tall fir-tree, whose intervening branches shield it from below, the network immediately above it is so close as to make it practically a domed¹ nest. It is thus made snow-proof,² a precaution which is the more necessary, inasmuch as the crossbill, unlike other birds—an abnormality, indeed, almost as great as his structural one—breeds at all seasons of the year, in winter as well as in spring.³ For the rest, though large, the nest is an admirable structure, the base being formed of a quantity of small fir-twigs—mixed sometimes with heather and grass stems—thickly quilted, as it were, with moss and lichen, or with the last entirely, which, of a finer quality—often combined with grass or the filaments of tree-roots, more rarely with a few feathers—forms, also, the interior lining.⁴ Warm amidst this, though the snow may whirl around her, and “winter storms sing i’ the tree,” sits the female, who alone both builds and broods, whilst the male flies backwards and forwards bringing

¹ Naumann, *Naturgeschichte der Vögel Mitteleuropas*, iii.

² *Ibid.*

³ In fact in every month of the year. *Ibid.*

⁴ The above account, which follows the interesting one of Naumann, is to be understood as applying *par excellence* to the continental type of the crossbill's nest, just as does that given by Ussher and Warren (*Birds of Ireland*) to the British-Insular specimens more particularly. It can hardly be doubted that climatic and other geographical differences must produce some corresponding variations, either in the architecture of the nest or the materials used in its construction, or in both, the more so that seasonal modifications are to be noted even within the same locality. (See *ante*, “Classified Notes,” p. 80.)

her food, or sings to her, near, amidst the branches or from the tall spire in which they end, or, in love-flight, circles like a roseate flame above that close, dark bower where all his heart lies hid. He will sing as he circles, too, sometimes—the true finch ecstasy—and thus we see the same figure that was used in the courtship continued now when courtship is no longer needed. But the old feelings remain, and so the old measure is trodden.

We may say, perhaps, that the nest constructed by the crossbill offers the highest example of the massive, as opposed to the light, style of finch architecture, the last being best represented by the chaffinch, brambling, goldfinch, siskin, and perhaps both the redpolls. From it there is a declension through that of the bullfinch, which yet retains considerable excellence, to the greenfinch's, linnet's, twite's and hawfinch's. In the nest of the greenfinch we have, as it were, a sort of middle degree of merit, which seems to have developed along two paths, one *viâ* Bullfinch to Crossbill, the other through Carduelis to Cœlebs. To some, perhaps, this road-map may seem fanciful, but what is science when not quickened by the imagination?

As has been seen, although it is generally, if not always, the female finch who takes the chief part in building the nest, whilst, in several cases, she may be alone the architect, yet there is almost invariably a conflict of evidence, both in regard to this latter point¹ and also as to the extent to which she is helped by the male. From the incubatory point of view, also, the conjugal merits of the latter have been frequently in dispute, so that there can, I think, be little doubt that, in both these respects, some individuals make better husbands than others. Speaking generally, however, it would seem that whilst, in the case of the chaffinch, hawfinch, bullfinch and mealy redpoll, to go no further—the male, as well as the female, incubates (leaving the share taken by each doubtful), in that of the crossbill, goldfinch, greenfinch, linnet and

¹ The crossbill is, as far as I know, the sole exception.

siskin¹ only the female does. It is stated by Naumann, however, that the male greenfinch occasionally, if rarely (*ich erinnere mich nur einigemal*), takes his place on the eggs, and that the male house- and tree-sparrow habitually do so.²

In each of the above two classes of activity—nidification, namely, and incubation—as also in the relative share taken by the two parents in the subsequent care and nurture of the young—for in this the male almost invariably renders some assistance—an interesting field lies open for future investigation. It is not sufficient, as in England it has been long thought to be, to know when and where a bird builds, how its nest may be recognised, what are the colours and markings of its eggs. All this, especially the last, may be most absorbingly interesting, but something more intimate and psychological remains, and until we know, with some degree of fulness (which must include the habits and relations of both the sexes in all these respects), how birds build,³ how they incubate, and how they rear their young, we have not torn out the heart of their mystery. In all these, but especially in the two first, there would seem to be an individually fluctuating element on the part of the male, more particularly, which, if properly studied, might lead us to conjecture how or why he first adopted or gave up the habit, and thus gain some insight into the causes of the differentiation of the sexual relations in regard to it.

The greater number of our finches feed their young with seeds that have been first swallowed and softened in the crop, as, for

¹ For all these see *ante*, "Classified Notes," under *Finches*. For the mealy redpoll see Collett, quoted in Sharpe and Dresser and in Naumann.

² *Ibid.* Owing to the number of opposed assertions, and the difficulty there sometimes is in knowing whether they are from the writer's observation, it is almost impossible to state the facts uninfluenced by the personal equation. My own, for example, gives more weight to affirmative statements than to negative ones, it being easy to miss a bird that has either been, or is coming, to the nest, but not so easy to see it there, if, in fact, it is not there. Unless we are told, internal evidence must be the guide as to whether or not a statement is from personal knowledge.

³ It is through observation of this, as I believe, that the origin and philosophy of avine nidification is to be discovered. I have, as I think, brought forward good, though not extensive, evidence to show that the practice has grown out of those nervous, and often violent, movements, at a certain season, which, along another path, have led to the nuptial display. Both, in my opinion, have been made out of the same raw material. See my paper in the *Zoologist* for December 1901, vol. v. pp. 459-462, and April 1902, vol. vi. pp. 133-144.

Plate 14

Cock Chaffinch feeding the Young, the Hen waiting

By H. Goodchild

instance, the greenfinch, bullfinch, linnet, twite, redpolls. Most of these, however, vary the diet with insects, especially in the earlier stages, whilst the hawfinch, sparrow and tree-sparrow adopt this régime, if not entirely, at least as a staple. To these, according to Naumann and others, the chaffinch is to be added; but Fatio¹ declares the young of the latter to be fed, at a later period, with seeds disgorged from the crop, and Bailly² also says the same thing, or, at any rate, that triturated seeds are given them. No other observer, as far as I am aware, has remarked this, but a very good provisional rule in the estimation of evidence, is to be more impressed with affirmative than with negative statements. If it is only sometimes that the chaffinch does this, that makes it all the more interesting.

Some recent observations by Mr. Farren would seem to favour this latter conclusion, since the young were then fed, though fledged and almost ready to fly, on green caterpillars and some other insects, a skipper butterfly, on one occasion, being amongst the number. The element of doubt, however, is perhaps not entirely eliminated, Mr. Farren's words being as follows:—"It was not easy to identify the nature of the food, since generally it was carried quite hidden from sight, in the mouth or throat, and it was only as it was regurgitated, just before delivery to the young, that I caught sight of it. I afterwards found some pieces which had been dropped in the nest, by which I was able to confirm my previous identification."³ But if the possibility of the food having sometimes been not insects, but grain, is here excluded (which it, perhaps, is not absolutely), we are still left in doubt whether the caterpillars had first been swallowed, or were only, or only sometimes, brought in the mouth or throat, as suggested. If the former, or even if the latter, then we may perhaps see a step in a process of transition, the course of which would be—insects brought in the beak—mouth—throat—swallowed first and regurgitated—

¹ *Oiseaux de la Suisse.*

³ *Country Life*, July 13, 1907.

² *Ornith. de la Savoie.*

regurgitated at the same time with seeds—regurgitated seeds as distinct from insects—regurgitated seeds alone. We can also understand how Fatio and Bailly, seeing the bird fly in with nothing in its bill and then regurgitate something, may have assumed this to be grain when it really was insects. This, indeed, is rather an unhand-some supposition, as against so good and painstaking an observer as the latter seems to have been; but, then, it may be wide of the mark, or, again, “*dormitat nonnunquam bonus Homerus.*”

Whatever the food, or whatever the method of sustenance adopted, young chaffinches are extremely well looked after, their state, from this point of view, being a more gracious one than that of young goldfinches, who are not fed, apparently, more than once an hour.¹ Once in ten minutes would seem to be the usual chaffinch rule, and sometimes the interval may be diminished to five or even three. Thus, within the space of an hour and a quarter, twenty-one visits were observed, ten by the male and eleven by the female, in every one of which food was brought (which need not always be the case), and so attentive and careful were the parents that, if not entirely satisfied with the position of the morsel delivered in the mouth of the quite young fledgling, they would replace it properly, or even remove it and give it to another of the brood.²

An observation that has been made, both in regard to the chaffinch³ and goldfinch,⁴ viz. that when any of the young leave the nest the male alone returns to it, whilst the female devotes herself solely to those that have flown, is interesting as showing, or at least suggesting, how the habit of both parents feeding the young, instead of only one, may have been fostered through natural selection; for if this last must be disadvantageous, even while the family are together, it would be doubly so when it became separated. The exit takes

¹ See a very interesting and sympathetic paper by Miss M. E. Bruce in vol. xv. of *The Auk*, pp. 239-43. The observations, it is true, were made in the United States, and the Latin name of the goldfinch is not given. Still, it seems probable that what applies to the North American species of goldfinch would apply also to our own.

² *Country Life*, July 13, 1907.

³ Farren, *op. cit.*

⁴ Bruce, *op. cit.*

place, roughly speaking, in about a fortnight (in the case of the goldfinch it was observed by Miss Bruce on the sixteenth day); and is of an impromptu nature. The young bird scrambles on to the edge of the nest, balances itself for a little, and then flies off, sometimes out of its own and into a neighbouring tree. Or it will crawl out and try flying afterwards, but in no case do the parents appear to teach—that is to say, assist—it to fly. Their method seems rather to be, if the chicks are old enough, to leave them to the spur of hunger, so that an unduly timid one may be left for some time without a meal. If this, however, does not bring him out, one or both parents will return, when the encouragement of their presence, with his own eagerness for food, is generally sufficient to do so.

That the young do not all fly together seems *prima facie* to be evidence that the incubation of all the eggs does not always begin at exactly the same time. In the case of the goldfinch, Miss Bruce writes as follows:—"When I first looked into the nest there were six eggs, but my little girl friend had told me that there were but two eggs laid when the bird began to sit, and I was curious to know whether there would not be a marked difference in the age of the young ones. After two weeks' patient waiting, the little mother and I were rewarded by finding among the pretty eggs a very ugly birdling. On my afternoon visit there were three little birds, the next day four, and on the day following, I counted five heads"¹ (the sixth egg was not hatched). Between the fifth and the first young one, therefore, there would have been some two days' difference, and in so short an infancy not days merely but hours ought to count. This appears to me to be a more probable explanation of the fact in question than difference in disposition, though, to be sure, in birds' nests, as in other family residences, all are not alike. A restless, unsatisfied feeling seems to precede the exodus, early associations

¹ *The Auk*, vol. xv. pp. 239-43. Naumann says that the female crossbill also begins incubating at once as soon as she has laid her first egg. On the other hand, the female twite of the pair watched by Saxby waited till she had laid all hers. It would appear, therefore, that there is no invariable rule.

are no longer operative, and the home has lost its charm. Presumably these particulars are not confined to the two species to which the above observations relate, but, in a general manner, may be applied to the whole family.

It used to be thought that not only were the greenfinch, bullfinch, twite, linnet, redpolls, etc., strict vegetarians in their own persons, but that they fed their young exclusively on a similar diet. The accumulation of evidence, however, has shown both these suppositions to have been unfounded in several instances, and it is probable that the list of exceptions will grow till all are included. I, at any rate, find it hard to believe that a British finch of any species will not eat insects occasionally,—when time shall serve,—as has been proved in the case of one (to be similarly mentioned) long thought pre-eminently vegetarian. However this may be, both the bullfinch and greenfinch are now known to give their young (presumably) raw insects, as well as prepared seeds, nor is it certain, in the case of the latter, that the seeds are swallowed or even macerated (by which I understand bruised or crushed with the mandibles), which is what Harting says that they are. At any rate, such maceration cannot be looked upon as invariable, since it now appears (as if it were something quite new) that Blake Knox stated in the *Zoologist*, so long ago as 1866 (painful ideas of burial this gives to the modern contributor), that the seeds are merely shelled, and then given entire. He goes on to say that the digestion of the young greenfinches is, in consequence, slow, and that their throats, unlike those of young chaffinches, are always well packed, “the parents feeding them only at long intervals, very thoroughly, so that they are not often seen at the nest.”¹

These interesting observations, which ought to have been at once taken up, as it were, and made part of our common ornithological knowledge, have been apparently forgotten for the last forty years or

¹ This agrees, in an interesting manner, with Miss Bruce's observations on the goldfinch. See *ante*, p. 122.

so, the pages in which they first appeared thus becoming, as so often happens, at once their cradle and their grave. So it will be, I suppose, with my own observations on the ruff, redshanks, blackcock, etc., in relation to sexual selection (however important) or on the stone-curlew, with its strange autumn "dances," or antics, and so on. "I wonder that you will still be talking, Signior Benedick; nobody marks you."¹

A bird that has always been supposed to feed its young exclusively on the seeds of the fir, regurgitated from the crop, is the crossbill, yet, even in its case, a doubt would seem to obtain, since Ussher and Warren saw the parents, in Ireland, flying to the nest with what appeared to be the green early buds of the larch. If so, it seems probable that these may also play a part in the régime; and since, as we shall see, the grown crossbill has not entirely dispensed with an insect diet, at least upon occasion, it is not quite impossible that the young may sometimes, if only to a slight extent, receive the benefit of this also from their attached and indulgent parents. Few birds, indeed, in matters domestic and conjugal, are more exemplary than these. So closely does the female brood upon her eggs that she has ere now paid the penalty of her maternal, and somebody else's scientific, devotion, with her life. But should she escape so fatal a conjunction, she is then, as we have seen, while so importantly occupied, faithfully fed by the male, who, as he flies up, utters his call-note, a sharp "*gip, gip*," which she answers lovingly, from the nest, with a soft "*yup, yup*."²

The rosy circling of the male crossbill above the nesting-tree has been already referred to, and a few words may now be added on the subject of that plumage to which this and similar epithets can be applied.³ I was not till quite recently aware that any naturalist really

¹ The foolish and even insulting idea that a clearly observed fact—even when observed repeatedly by the same person—requires "confirmation" from somebody else, may have something to do with this discreditable state of things. Before anybody wants, or will take the trouble, to confirm it, it is forgotten, especially should it happen to tell against any received view, in which case there is a strong wish to forget it. Thus poor Sprengel lay for years in his paper sarcophagus, till dug out of it, at last, by a stronger spade—to wit, Darwin's.

² Ussher and Warren, *Birds of Ireland*.

³ As, for instance, "rose-colour," "rosy red," "carmine," "rich crimson-red varied in places by a flame colour," and so on.

supported the view that the brilliant hues of the male crossbill have been acquired through the laws of protective coloration, as directed by natural selection. Ussher and Warren, however, in their *Birds of Ireland*, remark as follows:—"The reds and greens of the crossbill's plumage may be regarded as protective plumage, the former harmonising with the russet bark of the Scotch fir, and the latter with the foliage." This view was endorsed by Cornish, from observations made by him in the Isle of Wight. He says, speaking of the cock, that the "red and orange-brown" of its plumage "is much less visible than might be supposed, for this matches the bright red-brown of the young pine-shoots and the bark of the branches"¹—a remark the force of which is somewhat discounted by others which precede it, to the effect that the male birds, in general colouring, are of "a more or less rosy red," that "many of them wore this garment in most resplendent fashion, the brightest and most brilliant tint showing constantly when they fluttered their wings and showed the parts beneath, as they tried to balance themselves on the tips of the pine-shoots," and that "others, sitting sunning themselves, looked like big red fruit on the trees."² The faith, as it appears to me, must be great, that can see in a bird of which this can be written an example of the principle under discussion. In this connection I would draw attention to the following considerations, viz.—1. That whatever may be the "red-brown" of the young pine-shoots as against the "crimson," or "rose," or "carmine," or "flame colour" of the male crossbill, there are also old pine-shoots in the northern fir-forests, nor is it always spring there. 2. That there is, besides, a great deal of snow in those latitudes, and that both birds and beasts of prey have to live all through the year. 3. That it is not the seeds of the Scotch fir or larch that are the food *par excellence* of *L. curvirostra*, as

¹ *Animal Artisans*, p. 111.

² *Ibid.*, p. 110. Wheelwright, who was not, I believe, obsessed by the theory in question—perhaps had not even heard of it, which would make him the better witness—writes in *A Spring and Summer in Lapland* of crossbills flitting about the fir forests "like parrots, their bright-red and orange plumage reflected in the rays of the afternoon sun."

distinct from *pityopsittacus*, but those of the much gloomier Norway spruce, whose distribution the bird follows,¹ and which is the predominant tree in its native forests. I, at least, have never seen this tree looking at all the colour of the adult male crossbill, but always dark, sad, and gloomy, though beautiful. 4. That conclusions as to adaptation to surroundings, based on the observations of a highly characteristic species out of its characteristic home, are liable to be untrustworthy. 5. That if the assimilation, here supposed, of the bird's colouring to the "red-brown" shoots and "russet" bark of the pine really exist, then the male crossbill is not, after all, a much more brilliant species than the hare or red deer; nor, indeed, if his plumage has become what it is through successive slight accentuations of vividness, is it easy to see why, on the harmonising principle, it should ever have passed beyond this moderate degree of emphasis. 6. That the hen crossbill must require protection, *at least as much as the male*, and that, since the young male's plumage shares in the comparative obscurity of hers, there can be no doubt that that of the adult male must have diverged from it. But if crimson was more protective than drab for him, why not for her—the hen—also, since the habits and resorts of both are alike? If, indeed, the male haunted poppy-fields, whilst the female kept to forests of conifer, the principle characteristic of whose foliage, whatever may be said about reds and greens, has been aptly summed up by Longfellow in the epithet "midnight," a case, perhaps, could be made out—but such is not the case. That foliage can and does hide (an oak is supposed to have hidden Charles II.) I am well aware from practical experience; and having seen even the male golden oriole disappear, as if by magic, on flying into this or that tree, I am not much impressed by that "almost invisible" quality which is attributed to so many bright animals nowadays that one might almost be led to suppose that the dull ones must be not less, but more conspicuous, since otherwise how are *they* ever seen at all—by a naturalist? "Crimson," "flame colour," "carmine,"

¹ Seebohm, *Hist. Brit. Birds*, 1884, vol. ii. p. 34.

“brilliant rosy red”—and invisibility! No, but there is in nature—as how should there not be?—a large amount of ordinary concealment, as well as of mere accidental resemblance, of which every creature—even, probably, a sheldrake or scarlet flamingo—at times gets the benefit. To distinguish between this and true special protective resemblance, acquired through natural selection, is what numbers of naturalists have not yet learned to do—or to try to do.

Something may here be said as to the crossbill's general habits of feeding. Sometimes he will extract the seed whilst swinging head-downwards on the cone, as it hangs, but more frequently he bites it off at the stalk, and feasts at leisure on the nearest convenient branch.¹ Not seldom he flies to another tree with it, holding it with the point forwards, or he may even fly down after a cone that drops, and rifle it where it lies, on the ground.² There, too, he will pick up seeds that have escaped from their sheathings, like any ordinary bird.³ Either in the tree, or under it, when the cone is detached, he holds it with one foot, like a parrot⁴ (but without lifting it), and then, with his hooked beak, presents a very parrot-like appearance. It is also interesting, as showing how habit tends to follow structure, to know that he uses the beak as a parrot does, in climbing;⁵ for no one can suppose that it has been thus abnormally modified in relation to such an employment of it. With all the bird's powers of extracting seeds scientifically, some of the sheaths prove too hard for him to open without previous biting and gnawing, whilst some he must even tear to pieces. It seems curious that, with others all about, he should waste time in doing this, but such is the case. That insects, also, occasionally form a part of the crossbill's diet has already been mentioned. Saxby thus describes his *modus operandi* :—“In summer the elm-leaves were often nearly destroyed by large numbers of *aphides* which, gathering upon the underside, caused each leaf practically to dry up and shrivel.

¹ Naumann, *Naturgeschichte der Vögel Mitteleuropas*, iii.; Ussher and Warren, *Birds of Ireland*.

² Cornish, *Animal Artisans*.

³ Naumann, *op. cit.*

⁴ Naumann, *op. cit.*; Cornish, *Animal Artisans*.

⁵ Naumann; Cornish, *op. cit.*

The crossbills gather these leaves, and grasping them in one foot—resting upon the other foot—rapidly clear them of their inhabitants, dropping them in hundreds at the foot of the tree.”¹ If this refers to the Shetlands I must have seen the trees, as they are the only ones in the islands, and situated, I believe, in what was once the observer’s garden—stunted, small things, more like hazels, owing their existence to being protected by four walls from the everlasting winds.

The young of the linnet, twite, and redpolls are also fed with seeds regurgitated from the crop, but although, so far as I am aware, no evidence has been adduced, in the case of the two first-named, that insects form, also, a part of their diet, it is significant that larvæ, and the fragments of a weevil, have been found within the crop or stomach of a young lesser redpoll.² The same method is employed in the siskin nursery, but, according to Bailly,³ only at first. Afterwards the chicks get seeds which have been bruised in the bill (“*broyés*”) but not swallowed (thus, at least, I understand him), and buds in their natural state. Yet even this earlier vegetable course is preceded by an animal one, the very young nestlings being fed with aphides.⁴ As far as is yet known, which is not very far, in my opinion, the young hawfinch gets caterpillars to eat;⁵ but no doubt, as time goes on, his rations will become more liberal, as are those of both the young house- and tree-sparrow, in which a certain modicum of apparently untreated vegetable food is included.⁶

It is clear from the above facts that the young of the Fringillidæ are not fed by their parents in a quite uniform manner, and also that the dietetic régime of the various species, in their adult state, is not uniform. These are interesting points. The food of the family, as a whole, consists both of seeds and insects; but whilst some of the

¹ *Birds of Shetland*.

² See “Classified Notes,” *ante*, p. 73.

³ *Oiseaux de la Savoie*.

⁴ It was this, no doubt, which led Naumann to state that the young received insects throughout.

⁵ Seebohm, *Hist. British Birds*.

⁶ See *ante*, “Classified Notes,” pp. 77 and 79.

species have, in the adult state, largely, or even wholly (that, at least, is the official view), given up the latter, and also feed their young, for the most part, if not in some cases entirely, on seeds that have been softened in the crop—as the linnet, twite, crossbill, etc.—others, such as the chaffinch, brambling, sparrow and tree-sparrow, are both fonder of insects themselves, and prefer them as food for their offspring. There is, however, no necessary connection between personal and parental habits in this respect, since the hawfinch, the staple of whose diet is (or is supposed to be) vegetable,¹ feeds the young on insects,² and the linnet, which, officially, gives them nothing but seeds, is itself, to some extent, an insect-eater.³

As the two diets of insects and seeds differ entirely, it may perhaps be conjectured that our finches first confined themselves to one of them, though which that one was may not be so easy to determine. Perhaps, if we think of the hardness or snow-covered state of the ground during much of the winter in north temperate Europe, and of the many asylums for small hybernating creatures, it may seem a more likely conjecture—since many of our small resident birds are wholly or almost wholly carnivorous—that insects, construed, in a large sense, to include spiders, slugs, and the like, were the primitive finch food. The fact that they are, in general, offered to the young without previous swallowing or dressing, which is certainly the more simple method, may add to the probability of its having been the first practised. We must assume, moreover, that whatever was the food of the grown bird would, in the first instance, have been that of the nestling also—for how could an idea of varying it to something not previously tried have occurred, “on a sudden,” to either or both parents? But if a change in the method of feeding the young has taken place, it seems, *prima facie*, more probable that this has been from the simple to the complex rather than the other way, and

¹ This, according to Naumann's editor, is the most that can be said, even if as much can be. See *post*, p. 155, footnote.

² Seebohm, *Hist. British Birds*; Naumann, *Naturgeschichte der Vögel Mitteleuropas*, iii.

³ See *ante*, “Classified Notes,” p. 76.

since the former is the process by which insect food, more particularly, is administered, both the one and the other are a survival, probably, or continuance, of earlier dietary habits.

How, then, did our finches, previously accustomed to bring their young caterpillars or spiders in the bill, begin, instead, to regurgitate seeds or buds, for them, from the crop? Of course, a variation in the diet of the old birds would be a motive for making a corresponding change in that of the fledglings, though, by a conservative instinct analogous to that by which ancient usage is preserved in legal or religious rite and ceremony, this tendency might be resisted. Seeds can be transported in the bill, as are grains of wheat and barley by the house- and tree-sparrow, but, where they are small, this would be a tedious process, nor would a number, perhaps, be so easy to carry as a beakful of insects. If only the idea could have been hit upon of bringing up the seeds again, at the nest, after they had been swallowed afield, it would have been, for the Finch tribe—now become largely seed-eaters—as the invention of fire to the contemporaries of Prometheus. But how could it have been, or, rather, how was it?

As to this, young birds, especially when large enough to be active in the nest, are very importunate for food. The parents are pressed and worried, and often resist their endeavours by turnings and motions of the head. In some of these, as the action seems an easy one with birds generally, there may have been slight, involuntary regurgitations, and, since the beaks of the young would be always seeking those of the parents, these might have been taken advantage of, sought again, expected, excited, till, finally, through stages which I myself have no difficulty in imagining, and which may even be, to some extent, seen,¹ the thing grew into a custom. Once established by precedent, this method of giving the food, which allowed the parents to feed upon it too, would have become more and more congenial to them, till, in the end, they would have taken the initiative, and satisfied, in this manner, not only the craving, im-

¹ As, for instance, with the cormorant.

portunate fledglings, but also the naked and helpless innocents just hatched from the egg. This little speculation, however, must be taken without prejudice to the one which preceded it a few paces back. I have not time to see if they jar.

Thus we come, at last, to the linnet, twite, and crossbill, who feed the young wholly in this way,¹ but we might expect, if this were an approximately correct view, to find amongst the various members of the family some traces of the transition, which, accordingly, in by far the greater number, we do find. Besides those species which have been mentioned as feeding their young by both processes, and with each class of food, there is also the goldfinch,² who, by some unaccountable oversight, has been left out. To see him doing so, in whichever way, is, of course, a charming sight, but there must, I think, be something still more exquisite in the way that large, conical (also comical) beak of the hawfinch—made for the cracking of hard things³—may be conceived as holding—tenderly, as it were, yet with firm, judicious pressure—the soft, albeit not lightly yielding, body of some prim fly or coy caterpillar. But may it not be more than one? since many birds, in feeding their families, do not bring each insect singly, but a number of them together, pressed close in a little heap, all struggling, writhing—often, incidentally, bursting—by the which thrifty method of procedure those pleasing sensations, derived from the contemplation of maternal love and solicitude in the lower animals, are much enhanced. Possibly, therefore, *Coccothraustes* adopts this plan also, and, if so, then what a heap it must be in such a beak as his!

The above represents, in short compass, our present knowledge as to the parental habits of the *Fringillinæ*. It may be added that, like most other birds, the greater number of the species have a due regard for the laws of sanitation, and, by carrying away or

¹ As far as is known, that is to say, up to the present—a very saving clause indeed.

² Perhaps, too, the chaffinch and greenfinch, or even the crossbill. According to Naumann and others, however, the former bird feeds its young only with insects, as do the other ones with regurgitated seeds.

³ But see *post*, p. 155, footnote 1.

Plate 15

Goldfinch (hen) feeding its young, the male alighting

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swallowing the dejecta¹ which would otherwise accumulate within or about the nest, ensure its comfort and cleanliness. To this laudable custom, however, the goldfinch, though so pretty a bird, would seem to be an exception, at least as far as the outside of the nest is concerned, and, as a penalty, is constrained to provide a new one for her second brood.² A similar and still graver laxity, extending to the actual dwelling apartment, has been remarked in the greenfinch,³ but there is reason to hope that here the taint has been individual only, and that the family, as a whole, are not involved in the disgrace, though they cannot quite escape the odium of it.

With these main facts of finch nursery economy it will be well to stop, for though they by no means exhaust the subject—being like the walls of a yet unfurnished elegant apartment—yet to describe at all detailedly, as such delicate fretwork requires to be, all that atmosphere of care and attention in which they are, so to speak, set—all the little ways, mannerisms, tendernesses, elegancies, prettinesses which coruscate and play about them—would be too long, if not too hopeless, a task. There is, however, an allied branch of the subject, on which, though less popular, some words may be said. Whilst much praise has been lavished on the care and solicitude with which birds feed their young, on the beauty and tenderness of the picture (as lately insisted on in the imagined case of the hawfinch), another kind of feeding—not parental, but conjugal—has been left comparatively unsung. Male birds, of various species and families, are accustomed to feed their mates in the nesting season, and, amongst them, several of our British finches—as the bullfinch, goldfinch, hawfinch—are to be prominently commended in this respect. They acquired the habit probably (or let us say perhaps) through helping their wives in the nursery, and, as the family grew, placed her upon the same footing. Having got to this, some rested satisfied and went no farther, but

¹ To be rejected, says Naumann, afterwards.

² H. A. Macpherson, *Fauna of Lakeland*, p. 134.

³ Both Hudson and Boraston, I think, mention this.

others have advanced more refinedly in this direction, expunged the grosser element of food from the meeting bills, and made the touch a kiss. If birds (and they are many) who go through this form do not kiss, then neither do we. The thing is so obvious that those who have seen it and still dream of human superiority in this respect, must be altogether mastered, as many indeed are, by the charms of this train of thought. Birds and men kiss, then—I do not know that others of our earth do—and, in either case, probably, the custom began in something quite practical. Do any male birds who are bound by no duty of feeding their young act in this way when they court? Does the ostrich or talegallus, the duck or the plover, the guinea-fowl, pheasant, partridge, or any other of the *Gallinæ*? If not, then this, as I hold, supports my view as to the origin of such affectionate behaviour in others, since, for a superstructure, there must needs first have been a foundation. On the other hand, birds—such as pigeons—who most bill and coo, are assiduous feeders of their offspring, as are those also who feed their mates, whilst in some the two habits in question—kissing and conjugal feeding—are combined, or the one seems passing into the other. There are the gulls, for instance, and the parrots—or, at any rate, some of them.

But does any British finch kiss? I believe, without disparagement to the others, that the bullfinch does, since it is not always, when the birds touch their bills, that there is anything more solid between them. Often, when one may have thought otherwise, it has not been so. He has bent over her, with black lips parted, and she has raised hers to his, and they have met, but that was all—there was no food; it was a kiss. Such was unmistakably the opinion of Naumann, who was well acquainted with bullfinches in freedom and captivity, and reports of them, alike in both, that they often “*zärtlich mit einander tändeln und sich schnäbeln*” (tenderly bill and caress one another). Were feeding here the explanation, it would imply inaccuracy either of statement or observation, neither

Plate 16

Cock (upper bird) and hen Bullfinch about to bill

By A. W. Seaby

of which is to be lightly imputed to the author of the *Naturgeschichte der Vögel Deutschlands*.¹

As a bird of sentiment and refined feeling, therefore, the bullfinch, possibly, may stand at the very summit of the Finch family, but though assurance be wanting in regard to the others, we should hesitate to condemn them on mere want of evidence, at least till more attention has been paid to the matter in question. An open mind is, in justice as well as in prudence, required of us. The linnet, greenfinch, twite, goldfinch, both the redpolls—possibly also the chaffinch—are all finches that feed one another conjugally; possibly, therefore, they may also kiss. In the first four of these cases, at any rate, the female takes the labour of incubation either wholly, or almost wholly, upon herself, thus supplying the male with a motive for feeding her upon the nest, out of which, like “the bright consummate flower” from its stem, the more spiritual need might seem to have arisen. But it is by no means always that the origin of a habit has been in accordance with what, at first sight, would appear to be the common sense of it, and the male chaffinch has been asserted to feed the female,² as well as to assist her in incubation, which is also the case with both the house- and the tree-sparrow.³ All three, therefore, may possibly do as does the bullfinch, but, up to the present, they have not been seen to do so.

A brief résumé may here be attempted of the various call-notes (so called), cries, and songs, made use of by our British finches. Short it should certainly be, if the subject be approached from the utilitarian as opposed to the controversial point of view—a difficult matter, perhaps, since whilst no two living persons, in all probability, have ever agreed in their description of any bird’s note or song (except, perhaps, the cuckoo’s), or written it down alike, till some convention had been agreed upon, it is doubtful if any one of them

¹ Now *Der Vögel Mitteleuropas*. The old work, with its time-aroma, is most fragrant to the literary naturalist, and the quaint, small pictures much superior to the modern ones—in fact, little gems in their way. But, alas! it is now unpurchasable.

² Fatio, *Oiseaux de la Suisse*.

³ Zander, *Vögel Mecklenburgs*.

has ever been recognised through such attempts at assistance. It would, as I conceive, make no very real or practical difference, if, by some oversight or confusion, the items in the following list were to be ascribed, uniformly, to the wrong species, but I shall not, on this account, be less careful not to do so, though probably there would be as many for as against the new scheme: with which warning—for it should temper undue expectation—I will permit my “adventurous *pen*” to “pursue,” not “things unattempted yet” certainly (far from it), but certainly as yet unachieved—which is almost as bold—“in prose or rhyme.”

The chaffinch in its song—which lasts from February to June—is supposed by some to say, “In another month will come a wheatear.” Space is insufficient for other possible renderings of the bird’s meaning, but the mode of expression—the rapid little strain, with the long, pronounced note at the end—is familiar to all who are ever likely to have a curiosity on the subject. The call-note is the loud “*pink*,” “*spink*,” “*twik*,” “*tweet*,” etc., common to both sexes, but according to Witchell, from whom the following facts have been taken, there is another, a short loud “*whit*,” which is uttered only by the male. The “*whit*” is sometimes used as an alarm-note, which might distinguish it from the “*pink*” were not this used as an alarm-note also, as is, moreover, on various occasions, the last note—the “*ear*”—of the song. Furthermore, the “*pink*” is a battle-cry, but since it is also uttered when there is neither danger nor likelihood of battle, it is equally, as far as one can see, both a peace- and a safety-cry, so that the definiteness of all these four meanings seems proportionately weakened. Moreover, it is used as a signal for roosting in the winter, and as a signal that all is well—that is to say, for nothing in particular—at any time. The “*whit*” is uttered during the first four months of the year, and the “*pink*,” which succeeds it, is in its turn followed by a “*tysh*,” which is the autumn call-note. The mutual love-note of the two sexes is a sound like the “*chissick*” (not to give variants) of the sparrow, but the young birds employ this same love-

note as the call-note, whilst the "*whit*," besides being an alarm-note, may also be uttered to make a noise, or attract attention. Also the "*tysh*," though it remains *the* autumn note, may be heard at other seasons.¹

It will be admitted that all this is very confusing, and, personally, I think that the meanings supposed to be conveyed by birds, in their various notes, have been far too much specialised, that a much greater definiteness than they really possess, with a corresponding exclusiveness, has been read into them. They correspond, as I believe, to various emotional states, each of which may cover a wide area—indeed, so wide a one as to give to the cry no very particular significance. The song or cries peculiar to, or characteristic of, the breeding-season, do, indeed, relate to the activities which then arise; yet within these limits there is, again, much indefiniteness, or these very notes themselves may be pressed into the service of other states of mind, and be uttered at other seasons. It should be remembered that a bird must either be silent or utter *some* note, on every occasion, so that unless it be held that *every* occasion moving to utterance has its special one, there must almost necessarily be a considerable putting-to-all-work. When a cry is uttered upon various occasions standing in no relation, or even in an opposite relation, to one another, it is absurd, as it seems to me, to credit it with such different or opposite meanings. Rather it has no meaning, in any proper sense of the word, but is merely a part of that bird—a vocal symbol of *Cœlebs*, *Carduelis*, etc.

The brambling has a harsh, chirping call-note, which, according to Forrest,² is quite different from that of any other finch, but according to Lilford³ is not unlike the "*pink*" of the chaffinch, though sharper and quite unmistakable. The latter thinks that the song, "low and harsh," resembles that of the greenfinch, in which Yarrell, who says that it ends in a "hoarse and droning note," agrees with him, adding that it is "not in the least like a chaffinch's."⁴ Collett, however, who

¹ C. A. Witchell, *Cries and Call-notes of Wild Birds*.

² *Fauna of N. Wales*.

³ *Birds of Northampton*.

⁴ *Hist. of Brit. Birds*.

heard it in Norway, speaks much more highly, and (as I well believe) justly, of the brambling's song. He says: "The true song is sweet and melodious, consisting of several flute-like notes, somewhat resembling those of the redwing," and adds that it is "only heard in the breeding season."¹ No doubt, when the bird sings here it is not his "true song"—there must be his true northern home to inspire it. The goldfinch's call-note is "*twitt-itt-itt*," whilst repetitions and variations of this simple theme make up its song,² which is, however, a sweet one. The greenfinch has two call-notes, each uttered by both sexes, most frequently during flight. The first is a "*dididit*," or "*twit, twit, twit*," which may be further prolonged, the second a more vehement "*yell, yell*," etc. (from one to half a dozen), which belongs more to autumn, and may be called the flocking note *par excellence*. Both these are combined with the song, or, rather, they together constitute it, with the exception of one note at the end, with which I am very familiar, and which Witchell terms "a coarse wheeze, almost a rattle;"³ my own opinion of it, and of its apparent significance, I have already recorded.⁴ The last may be (and constantly is) uttered singly, and (as I know to my cost) repeatedly. It never begins the song, and is sometimes left out of it, being not often uttered in flight, as the other parts are.⁵

The call-note of the linnet—which may also become an alarm-cry—is a curious rapid chuckle, followed by a twitter, like the "*dit-it-it*" of the greenfinch.⁶ The song is, apparently, a repetition (yet surely much ennobled) of the same chuckling strain, and is often uttered in chorus by many birds together.⁷ Bailly expresses it by the syllables "*pi, pi, pi, pi*" (as pronounced in French), and draws attention to the fact that the hens contribute a "*petit gazouillement*" to the general effect, some of the older ones having even a "*suite de sons assez soutenus*."⁸ Naumann⁹

¹ As quoted in Sharpe and Dresser's *Birds of Europe*.

² Witchell, *Cries and Call-notes of Wild Birds*.

³ *Ibid.*

⁴ See *ante*, p. 92.

⁵ Witchell, *op. cit.*

⁶ *Ibid.*

⁷ *Ibid.*

⁸ *Ornithologie de la Savoie*.

⁹ *Naturgeschichte der Vögel Mitteleuropas*, iii.

describes the call-note of the twite as "*yägägägäck*," which, allowing for the German valuation of these syllables—*yegegegeck*, perhaps, for I do not presume to speak positively—makes some approach to the *dit-it-it* (or thereabouts), preceded by a chuckle, of the linnet. It also utters a single "*jäck*" (*yeck*) and a "*daii*" (*dar-ee*) and, as an alarm-note, a "*scheh-sche-schei*," the song being, mostly, a combination of all these elements. According to Ussher,¹ the latter is a series of exclamations of which the longest upbraids "*lazy Jenny!*", and with this Warren² concurs. Macpherson,³ however, in conjunction with Harvie-Brown,⁴ presents us with a more pleasing picture of the male, in summer, "rising singly, on the wing, and, after describing a short circle, descending, spirally, on expanded pinions"—thus avoiding tautology: whilst R. Gray⁵ speaks of its "encouraging chatter," "piping notes," "shrill, joyous cry," and "strange music." Witchell,⁶ however, allows the same bird nothing but a frequently repeated "wheeze" as a call-note, and describes the song as "but little more than repetitions of this!"

Naumann⁷ was not impressed with the singing capacities of either of our two redpolls, referring to them as "*wenig wert*" (worth little). Forrest⁸ makes amends to the lesser one by speaking of its "pleasing, low, twittering song," uttered in chorus, at roosting-time, on a July evening. The call-note is a rapid, rattling twitter—"tschult" according to Naumann—uttered as the birds fly together, at a height above that of other finches.⁹ Witchell¹⁰ says that the tones of the lesser redpoll have an exaggerated resemblance to those of the greenfinch, and refers to its "even coarser wheeze." Its call, also, would be a "*tit-it-it*" (or *dit-it-it*) if it were not uttered at a lower pitch and in a less sharp tone, by which it becomes a "*twut-tut-tutt*."¹¹

The mealy redpoll's call-note has been described as a "*chizzzzz*," and its song (without any intention of insulting the bird) as either "*zig-wig*,"

¹ *Birds of Ireland*.

³ *Fauna of N.-W. Scotland*.

⁵ *Birds of the West of Scotland*.

⁷ *Naturgeschichte der Vögel Mitteleuropas*, iii.

⁹ *Ibid.*

¹¹ Witchell, *op. cit.*

² *Ibid.*

⁴ *Ibid.*

⁶ *Op. cit.*

⁸ *Fauna of N. Wales*.

¹⁰ *Op. cit.*

chutta, chutta, che, we, we,” or “*chick, chick, chick, wee, we*”—the latter being uttered in flight.¹ The nuptial song, with its accompanying flight, of the siskin has already been referred to. It consists of a number of twittering sounds, sweet according to some,² not pleasing (“*nicht schön*”) according to others.³ Besides this, it has a shrill, clear cry, said to be like that of no other bird, and, if put to flight suddenly, testifies some impatience, yet withal makes light of the incident with a “*tut, tut, tut!*”⁴

The house-sparrow, though no songster, makes use of a good many notes, which Naumann⁵ has classified as follows:—There is “*schilp*,” the call-note when perched, “*dieb*” that used in flight, “*dürr*” (*deer*) and “*die, die, die*” (*dee*), of a sentimental complexion, “*tell, terell, tell, tell, tell,*” the breeding-note, “*terrr*” that of warning, whilst “*diel*” and “*schilk*” are reserved for love in its higher forms. “*Schelm!*” though it might seem naturally to go with “*Dieb!*” is apparently undefined. Naumann, besides that he was perhaps the greatest field ornithologist that ever lived, was also a German, with, no doubt, a good ear, and it is, therefore, with becoming diffidence that I record my own personal opinion, or at any rate suspicion, that all or most of these sounds may be, and often are, used to express all or most of those meanings, each of which is supposed to correspond with some one of them.

The tree-sparrow’s notes are much like those of the house-sparrow, but whilst Naumann⁶ finds them “more musical,” Lilford⁷ describes them as “sharper and shriller,” a difference of opinion which would seem to be greater than the one of fact on which it is founded. In flight they have a “*teck, teck,*” sometimes a “*blui,*” and, should circumstances seem to warrant it, do not scruple to say “*dem!*”—often several times in succession—a habit which is soon caught by the fledgling young in the nest.⁸

¹ O. V. Aplin, *Zool.*, vol. xx. p. 451, and xxi. p. 69.

² Ussher and Warren, *Birds of Ireland*.

³ Naumann, *Naturgeschichte der Vögel Mitteleuropas*, iii.

⁴ Ussher and Warren, *Birds of Ireland*.

⁵ *Ibid.*

⁶ Naumann, *op. cit.*

⁷ *Op. cit.*, iii.

⁸ *Birds of Northampton.*

The sweet “*dee-ew*” or “*dee-it*” of the bullfinch, being its call, which upon another note or two becomes its song also, has been already referred to.¹ It has been described as a whistle, more feelingly as an “inward warble,” in making which the bird “puffs out its feathers and labours violently.”²

For the hawfinch, his call-note, according to Seebohm,³ is a sharp click, no doubt that which is referred to by Millais as a “peculiar clinking note,” heard during flight, and unmistakable. Naumann calls it a sharp “*zicks*” or “*knipps*,” but considers that a long “*zih*” (“*zee*”), also uttered on the wing or just before flying, is the more usual call-note, which, by rapid repetition, is changed into that of alarm. The song he describes as long, but poor, made up of the “*zicks*” aforesaid, and becoming, when many of the birds join in concert, “*ein sonderbares unangenehmes* ⁴ *Geschwirr*” (“a strange, disagreeable chattering”). A bird, however—still less a bird’s song—is never without a champion, and here both Macgillivray and Montagu come to the rescue, the former asserting that the hawfinch “sings pleasantly in low, plaintive notes, even in winter,”⁵ the latter⁶ that its “soft tones” resemble those of the bullfinch. To some extent this is confirmed by Seebohm, who describes the song as “four simple whistles on an ascending scale, the first two at a slight interval, and the last two repeated rapidly, one after the other, the final one being somewhat drawn out.”⁷ It would appear, therefore, that the hawfinch can sing “both high and low,” or at any rate in two very different manners.

The crossbill’s call, mostly uttered in flight, has been rendered “*tsip-tsip*” or “*tsup-tsup*,” “*yip-yip*,” “*yep-yep*,” or “*yup yup*,” “*gip-gip*,” “*gup-gup*,” “*sit-sit*,” and so on⁸—the class of sound may be imagined, the spelling, as in all such cases, must depend somewhat on “the taste and fancy of the speller.”⁹ Seebohm¹⁰ also speaks of a special call

¹ *Ante*, p. 98.

² Borrer, *Birds of Sussex*.

³ *Hist. Brit. Birds*. Millais, I think, is here quoted.

⁴ *Naturgeschichte der Vögel Mitteleuropas*, iii.

⁵ *A History of British Birds*.

⁶ As quoted by Macgillivray, *A History of British Birds*.

⁷ *A History of British Birds*.

⁸ Seebohm, Ussher, Warren, Witchell, etc.

⁹ Dickens, *Pickwick Papers*.

¹⁰ *Op. cit.*

—"tsow" or "tsoo," made by the male to the female, usually from the top of a tree; but it is not this, according to Ussher and Warren, but a sharp "*gip-gip*," which is employed by him when he flies up to feed her on the nest. This last, apparently, is the ordinary call, and when uttered by the female on the nest may be either a greeting or a request for food, as in other cases a cry of alarm or warning,¹ or, as I should myself say, a generalised sound uttered on all sorts of occasions, without any precise meaning being attached to it by the bird. The call or cry of the young is a "*chit-oo, chit-oo, chit, chit*."² From all accounts the song of the crossbill is a very charming performance,³ and must be made all the more so by the silence and sad solitude of those northern fir-forests in which it is *par excellence* to be heard. Amidst the security and still peace of these, the male, in all seasons, warbles love to his mate, which she, in fainter tones, sends back to him.

Though more typical, perhaps, as a family, of spring and summer leafiness, finches are interesting birds to watch in the winter-time. It is then that, through hunger, they become bolder, so that, by getting into haystacks in the early morning, before it has lightened, one can have them comfortably at a few yards, or even at a few feet distance. One sees thus, to perfection, their manner of divesting the seed from its outer husk, before eating it, and may notice that, whilst the greenfinch and others keep to the chaff-heap that lies by the stack, and eat with head in air, the goldfinch will walk, with assurance, to the stack itself, and, drawing out a blade, with the ear, stand and peck down upon it, like a little crow, husking each grain as it lies. For now the various species of the family are commingled, whilst tits, buntings, and others—the robin sometimes, with little pert flirt, and ever-demure, stealing hedge-sparrow—I would rather not mention him than call him anything else—help to make a warm-coloured patchwork on the white, cold carpet of the snow. It is

¹ *Birds of Ireland*.

² Ussher and Warren, *op. cit.*

³ Naumann, however, must be excepted. That there are individuals whose song can "even be called pleasing" is his highest praise.

here one may best see the bramblings, those northern beauties whose glowing hues of mingled copper and chestnut put, though they be but their winter robings, all others about them to shame—the yellowhammer's even and goldfinch's, much more those of the chaffinch, though the latter ruffles it with them, cheek by jowl, as though anxious to challenge comparison. For the linnet, his breast is not what it was in the summer, nor does he, unless hard pressed, affect mixed company,¹ whilst the hardest of winters will scarce make the bullfinch thus common. It was whilst watching (this *en passant*) such reunions, at close quarters, yet quite unsuspected, that I came to think birds were influenced in their movements by some form of thought-transference, or, as I have called it, collective thinking.² I have never seen any reason to alter this view, which further observation has since strengthened.

Though the song and call-notes of the brambling may sometimes be heard in this land, yet with us he is essentially a winter bird, and it is, perhaps, in his roosting habits at that season that we know him at his best; for we know him then, sometimes, in his thousands, and there is in such assemblages, when gathered for such a purpose, a very special class of excitement which I have often thought must have in it something analogous to that which prevails at migration. Indeed, it may be precisely the same, since it is the all having some set thing to do, and being met to do it, that gives excitement to numbers. Expectancy first, and then the deed, is the key-note, only the thing must be somewhat eventful and sufficiently concentrated into a period, not spread out through the day, like mere feeding, though even here some excitement may be shown.

Like greenfinches,³ bramblings are fond of evergreens as dormitories, and a Portugal laurel, especially, is for them full of charm. Thus they, too, should all local conditions be favourable, may become familiar with the garden shrubbery, but it is not until various

¹ Lilford, *Birds of Northampton*. There are, however, statements to the contrary.

² See *Bird Watching*, pp. 219-223, etc.

³ See *ante*, p. 91.

evolutions have been gone through, of an evening, that they reach this final rendezvous. Some little time before sunset, they collect into any tall trees that, like outposts, sentinel their chosen camp, from whence, later, they fly, in a body, into such as may stand close against it, or rise from its midst. One would think that the next stage would be the descent into the shrubbery itself, but daylight still lingers, and the birds are not yet ready for sleep. In small parties, of about a dozen together, they dash out over the country, where they are joined by other and larger ones, with which various family relations—greenfinches, chaffinches, or even, in favoured localities, goldfinches—may be commingled. And now, swollen in numbers and augmented in species, the flocks return, and, dropping, one after another, into their leafy ante-room, seem to wait there for bedtime. At last, when “the sun’s rim dips,” the whole of the assembly fly down in an orderly manner from the high twigs amongst which they have been perched, into the dark valley of evergreen trees and shrubs below, where they pass the night crowded together, and keeping as close to the trunk of each holly or laurel in which they cluster as their numbers will permit.¹

Next to a Portugal laurel, perhaps—which he cannot expect always—the brambling loves beech-trees to roost in. They have, indeed, the advantage, next morning, of producing beech-mast, to which he is partial—so partial that in England, where he can get it, he has been seen, in flocks numbering thousands, amongst “the beechen woods.”² In the north it is different. There, amidst dark shrouding conifers, with which his gay copper tintings and white and black patchery have doubtless been “shown” to assimilate, he sleeps in security, nor dreams of the poor purblind pine-marten.

The roosting habits of the greenfinch have been already referred to.³ Those of the linnet have this salient peculiarity amongst finches, viz. that he often roosts on the ground. “Amongst the

¹ Saxby, *Birds of Shetland*. North Wales is here referred to.

² T. H. Nelson and W. S. Clarke, *Birds of Yorkshire*.

³ *Ante*, p. 91.

thick grass and dry weeds," says Cordeaux; and adds that he has "frequently distinguished large flocks of them very early in the morning and late at night."¹ Lilford, in his *Birds of Northampton*, makes the same observation, but that they also roost in trees or bushes is equally certain;² and Bailly³ tells us how, in Savoy, they flock to the woods, in troops, at sunset, where they make ready for the night, choosing, more particularly, for their sleeping-trees, the oak and the witch-elm. Here they will dispute for places, and indulge in a little last conversation, and a feeble little "pee, pee, pee, pee, pee" continues to be heard out of the darkness, long after their proper bedtime. Yet withal they are early risers, and long before the sun is up fly out, either all together or in companies that follow one another to their accustomed feeding haunts.

But the house- and the tree-sparrow exhibit some peculiarities in their roosting habits which seem to stand in relation to the domed or otherwise enclosed nest, which with the former bird is general and with the latter invariable. Thus, during the winter, holes and the nests of various birds, are made use of as sleeping-places by both the species; but whilst the house-sparrow chooses its own, or those of the swallow or house-martin, by preference, the tree-sparrow favours crows' or hawks' nests—also the woodpecker's, but that may be classed under holes. Old walls and quarries, with such accommodation as is to be found under the eaves or windows of outhouses and buildings, are likewise common to the two, with the general distinction that while the house-sparrow's taste admits of, or even prefers, the close contiguity of humanity, the other, guided by a higher instinct, avoids it as far as is practicable. In such and such-like cosy nooks and crannies several birds will nestle together in apparent harmony, which, however, permits of some squabbling, over which darkness gradually exerts its well-known sedative influence.⁴ To the above the interesting statement is added that the house-sparrow, at

¹ *Birds of the Humber District.*

² Naumann, *Naturgeschichte der Vögel Mitteleuropas*, iii.

³ *Ornithologie de la Savoie.*

⁴ Naumann, *op. cit.*

any rate, when he sleeps in such places, lays down feathers—in fact, makes a feather-bed—for his warmth and comfort during the night.¹ All this, as before stated, is for the winter. In summer the more primitive lodgment of trees, shrubs, and reed-beds is as welcome to these as to other members of the Finch family, and the house-sparrow, especially, will roost amidst the upper branches of the former, undeterred by the frequent contingency of its being a rainy night.²

The above are perhaps the most interesting habits of the *Fringillidæ*, in connection with the important matter of going to bed, that are commonly open to observation in this country—though that expression can hardly be applied to those of the brambling. The crossbill's are possibly more interesting than any, since “many an aery wheel” accompanies its frequent social flights above the fir forests of its real home, and these would be no doubt intensified before the final descent into them for the night, which is passed amidst their densest gloom, takes place. But of this I can find no very arresting account. Of the rest of the species it is sufficient to say,³ shortly, that the bullfinch and redpolls roost in thick bushes, the goldfinch and hawfinch in tree-tops—the latter, also, in hedges during the winter—the chaffinch in trees, bushes, and hedges, the twite in plantations,⁴ and the siskin in the thickest parts of coniferous and other trees.

Though the roosting habits of socially-minded birds in the winter may be said to touch their flocking ones, yet they are not of the essence of this latter activity, and have, probably, nothing to do with its origin. Something, therefore, should be said in regard to the social or congregating impulse, as exhibited in varying degrees by our finches, treating this as a force in itself, without reference to any purpose or incidental advantage that may go along with it. Yet it is

¹ Zool. Garten, 1878, p. 205.

² C. A. Witchell, Zool., 1896, p. 77.

³ Naumann, *Naturgeschichte der Vögel Mitteleuropas*, iii.

⁴ When he can get them, doubtless, understood. He cannot, for instance, in the Shetlands, where he is common.

Plate 17

Bramblings in winter plumage

By A. W. Seaby

1885
A.W. SEABY.

not so much, after all, in the details, as in the general subject, and the questions arising out of it, that true interest lies. Why do birds flock? What was the origin of the habit? Is it an initial instinct, upon which, sometimes, circumstances may act as a check, or do circumstances alone produce the phenomenon? The number of solitary species seems a sufficient answer to the first of these questions;¹ whilst that habits themselves, however brought about, may pass, by degrees, into instincts, is a truth that can hardly be questioned. The rivalry and jealousy between male birds, as well as the proprietary feelings and protective instinct of both parents, which will not willingly suffer a too close contiguity to the neighbourhood of the nest, is sufficient to keep families apart during the season of domestic activities, but, when these are over, the check is relaxed, and there is no *prima facie* reason why like should not seek like. If, then, the numbers of the species, or the similarity of food and habits, tend to produce this result, it is easy to understand how a mere state of things, coming naturally about, should pass into a custom, and this, in some instances, into a craving so strong as even to break down the barriers just glanced at, so that nesting itself becomes social. Of this there is some indication even amongst our own finches, whilst their foreign relations, the Weaver-birds,² supply us with a crowning example of it. With this trifling preface we may pass from the general to the particular.

Bramblings, so social as we have seen them in their habits of roosting, are sufficiently so, even in the spring-time, for several to build their nests near together,³ sometimes, even, though this is exceptional, within the confined territory of a small juniper bush. When the period of domesticity is over, they yield entirely to the now more dominant instinct, and gather into flocks so vast as to attain, sometimes, even in Britain, a length of a quarter of a mile and a

¹ Yet the solitary habit may be induced.

² "Hardly to be distinguished from the *Fringillidæ*, except by their tenth primary being distinctly developed," says the *Cambridge Natural History*. A pedantic reason then, surely, for thus separating them.

³ R. Collett, quoted in Sharpe and Dresser's *Birds of Europe*.

breadth of some fifteen or twenty yards.¹ The number contained in such a body would be all the greater, because bramblings, under these circumstances, fly close together, presenting the appearance, according to one observer, of a "winged (say a many-winged) serpent."² When feeding thus, in numbers, together, the rearward members of the column keep constantly flying over the heads of those in front of them, so as to become the van. In this manner, says Bailly,³ they will pass from end to end of a field and back again, but this is a trait not peculiar either to them or to finches.

There does not appear to be any precise evidence, in the case of the brambling, of the male and female birds flocking separately. That they do not habitually do so is evident; but, as with the chaffinch, which species they resemble more than any other finch, it may be an occasional feature. In the latter bird this is said to be a northern habit; but although, in his *Birds of Oxfordshire*, Aplin remarks of it that "the sexes were formerly believed to separate in winter," Gilbert White's evidence should be held decisive on this point, even had it never been confirmed. He says, *inter alia*, "I see, every winter, vast flights of hen chaffinches, but none of cocks."⁴ To suppose that such a man could be mistaken on such a point, not once merely, but every winter, would be extremely ridiculous, and, moreover—which, however, I do not say as strengthening the evidence—I have seen the same thing myself, also every winter, in Berkshire, though here the numbers, if sometimes considerable, were never vast. But that they were every one hens I very well remember, and I have remarked the same tendency sometimes, though to a much less extent, in Suffolk, as recently, without this qualification, in Brittany. It is also exhibited, in a partial and fluctuating degree, by the greenfinch, which may perhaps be considered the most gregarious of the finches that breed with us, inasmuch as some four or

¹ R. Gray mentions one such instance in his *Birds of the West of Scotland*, but Stevenson (*Birds of Norfolk*) speaks of a flock which took thirty-five minutes in issuing from its roosting-place, flying continuously all the while; and this must have been very much larger.

² R. Gray, *op. cit.*

³ *Ornithologie de la Savoie.*

⁴ *The Natural History of Selborne.*

five will occasionally build their nests within a few yards of one another. The goldfinch does not, as far as is known, go quite to such lengths, nevertheless, by flying in parties to procure food for the young,¹ he remains, to some extent, social, even during the nesting time; and a similar habit has been remarked in the linnet.²

The crossbill is another of our finches which is gregarious, more or less, all the year round, food being sought by the males, in company, to give to the incubating females,³ and, again, by both parents, in a similar fashion, after the eggs have been hatched. Later the various families combine into flocks, which fly above the tops of the fir-trees, over which, as before stated, they will perform aerial antics reminding one of the sudden, downward swoop, ending in a somersault, often made by rooks when they come in to roost.⁴ How much the crimson plumage of the male must then, by harmonising with—what? something, no doubt; shall we say the sunset glow?⁵—protect him from the keen-eyed bird of prey, is too obvious to need pointing out. Whilst flying thus together, the crossbills utter at intervals their curious cry of “*tsip-tsip*” or “*tsup-tsup*,” etc. This, according to Seeböhm,⁶ is to keep the flock together, an explanation which, as the birds are diurnal, and not blind, seems wanting in the only evidence that could reasonably be held to support it.

Always social, even during the nesting-time, the linnet collects, in autumn, in flocks which, on the Continent, are sometimes described as immense,⁷ and continues thus banded throughout the winter. Leaving now his wooded haunts of summer, he descends upon the “boskie acres” and “unshrubb downes” of cultivation, where, according to Sharpe⁸ and Dresser, he consorts with others of his family, such as

¹ H. E. Forrest, *Fauna of N. Wales*.

² Bailly, *Ornithologie de la Savoie*.

³ Naumann, *Naturgeschichte der Vögel Mitteleuropas*, iii.

⁴ I think Forrest makes this interesting statement. If not Ussher and Warren, Cornish or Aplin may. It comes from a trustworthy source.

⁵ For the roosting-time this may serve. Something else must be thought of for earlier in the day.

⁶ *A History of British Birds*.

⁷ Bailly, *Ornithologie de la Savoie*; Sharpe and Dresser, *Birds of Europe*.

⁸ *Op. cit.*

the greenfinch or brambling, but, according to Lilford,¹ holds aloof, and admits not others to his company. A strange discrepancy upon a point so material! and it goes still further, since the former do not scruple to say that he hobnobs even with sparrows!² In time, no doubt, the truth will appear; meanwhile it may be conjectured that, over wide and varying localities, there is some variation in habits. Subject to this, however, I should incline to the less exclusive view of the birds' character, since, if not the twite, yet both the mealy and lesser redpolls, his very near kinsfolk, keep company, whilst flocking, not only with other finches, should they be about, but even with birds who have not that title to recommendation—such as tits. At least this *démarche* must be held to be established in the case of the mealy redpoll, since either Dresser or Sharpe (I have not been successful in my endeavours to ascertain which) says distinctly that, when in “small straggling flocks,” he has frequently seen him in company with titmice.³ This was in “the lonely forests of North America,” yet where there is a flock, however small, loneliness can hardly be pleaded as an excuse. It certainly looks like a proclivity. The fact has not been so clearly brought home to the lesser redpoll, yet the inference seems strongly against him. We certainly have it that, “during the winter, he is often seen frequenting birch and alder trees, sometimes in company with other small birds, clinging to ends of branches in all sorts of attitudes, like titmice and goldcrests.”⁴ This last, and the fact that the names of the small birds are not given, makes it extremely likely—in fact, almost forces one to believe—that they were tits, if not goldcrests, or, at any rate, that tits were amongst them. Since, therefore, two members of the genus *Linota* make themselves thus common, it need not surprise us that a third, and that the most representative of them, also should. In regard to the twite, evidence on this head seems wanting. Like the linnet, it collects, in winter, in flocks—albeit but small ones—and thus roams the country.⁵ It then (in the

¹ *Birds of Northampton*. He speaks of flocks of from twenty to sixty birds in the winter.

² *Birds of Europe*.

³ *Ibid.*

⁴ *Ibid.*

⁵ Saxby, *Birds of Shetland*.

Shetlands) seeks the stubble-fields, and even the stack-yards, feeding on the grains of wheat;¹ as does the lesser redpoll, in the later summer, on groundsel and seeds of the thistle, which it picks out whilst hanging to the plant in the same manner as the goldfinch.²

As has been seen, the linnet is, to some extent, social, even in his breeding habits, and this is also the case with the lesser redpoll, since we are told by Sharpe and Dresser that "several pairs will construct their nests close together."³ Yet they add that "this appears to be rather the exception than the rule, and may depend on the locality being a favourite one." Yarrell confirms this, and adds that "considerable numbers will often meet at places far from their nests."⁴ In regard to the mealy redpoll, as also the twite, there appears to be no special evidence in this direction.

The siskin, in winter, leaves the great conifer forests, where he has carried on his domestic arrangements after a semi-social fashion—for one nest is seldom very far from another—and resorts to the lower-lying champaign. Here the birds gather into flocks, which are often of large size, and fly about the country till the returning spring awakes in them fresh visions of courtship and a settled home.⁵ Siskins and redpolls often join company when thus flocking, and each of them seems equally satisfied with the arrangement. It is stated by Forrest⁶ that, in these winter gatherings, the male siskins always seem to outnumber the females.

The greenfinch, chaffinch, and goldfinch all flock during the autumn and winter, and all may be seen flying together, the first two quite commonly and sometimes in large numbers, but it is only rarely that they are reinforced by the third. The reason of this may seem painfully obvious, yet goldfinches, when I have myself seen them flocking, have kept very much to themselves. They flew in a wild, fluttering, winter-butterfly way, over the barren fields, on which they would suddenly descend before they had gone very far, and then,

¹ Saxby, *Birds of Shetland*.

² *Ibid.*

³ *Birds of Europe*.

⁴ *A History of British Birds*.

⁵ Sharpe and Dresser, *op. cit.*

⁶ *Fauna of N. Wales*.

after feeding a little, as suddenly rise and fly on again, their direction—first here and then there—seeming entirely capricious. With these mixed assemblages—greenfinches and chaffinches more particularly—sparrows often associate themselves, and, on the ground, tits and hedge-sparrows. Yet the sparrow—even “*Domesticus*”—though so common and vulgar, is not such a flocker as might have been expected. He does indeed flock, but, according to Macgillivray, such gatherings are “loose, and accidentally formed by individuals casually meeting with each other, and liable to be broken up by slight causes.”¹ Both he and the tree-sparrow, however—which latter species has been sometimes observed in large flocks—are accustomed to join with others of the family as well as with each other. The greenfinch, whom he most resembles, is perhaps the house-sparrow’s most usual consort on these occasions.

Where birds are gregarious, it is natural that the young of the first brood should form the first social gatherings of the advancing season, and be afterwards joined by their parents and younger brothers and sisters. Attention has been more specially called to this circumstance in the case of the greenfinch,² linnet,³ siskin,⁴ and the house-⁵ and tree-⁶ sparrows; but, perhaps, the difficulty would be to find any very marked exception to what seems almost a necessity of the case. One might, indeed, expect to find some difference, as between the various species, in regard to the length of time after quitting the nest at which these young birds begin flocking, on the general principle that no two beings are precisely alike in anything. Thus young linnets, according to Bailly,⁷ stay with their parents, “*ordinairement jusqu’à la période de la seconde couvée*” (laying of eggs). It may be doubted, however, whether in this they differ much from other young finches. It is, in fact, just what one would expect, for something seems needed to finally break the bond between parent

¹ *History of British Birds.*

² Seebohm, *History of British Birds.*

³ Bailly, *Ornithologie de la Savoie.*

⁴ Naumann, *Naturgeschichte der Vögel Mitteleuropas*, iii.

⁵ *Ibid.*

⁶ *Ibid.*

⁷ *Ornithologie de la Savoie.*

and child, and nothing could do so more effectually than the former having fresh domestic duties to attend to. Observations on this and other points relating to the formation of flocks in the different species, would be, no doubt, of interest—as what observation is not?—but personally, there does not appear to me to be anything very mysterious, either in the growth of the social instinct, or in the effects which naturally follow from it.

Two species yet remain to be considered in this sketch of the flocking habits of the *Fringillidæ*, which, as they differ, though in varying degrees, from the rest, and, to the same extent, approach one another, I have purposely left to the last. In the bullfinch we have a bird whose social instinct might seem to be but poorly developed. From September to April, but chiefly in winter, it is, indeed, seen in family parties, but seldom, according to Forrest,¹ in flocks. Lilford² and others concur in this, but Aplin³ has seen it in small flocks, of about a dozen together, in Oxfordshire. Personally I have never seen it more than three or four strong, that I remember, but, as to this, it is to be remarked that flocks are dependent on numbers, and the bullfinch, unfortunately, is with us anything but a numerous species. That where it is more abundant it congregates upon a more imposing scale, I have very little doubt, and we are, in fact, informed that in *Carinthia* “the families combine to form large flocks.”⁴ We are not told that these are made up of migrating birds, and even supposing them to be so, yet flocking is flocking, with whatever motive the individuals may be drawn together. At any rate, the more fortuitous the gathering, the less (as a necessary inference) can the social instinct be said to obtain, whereas birds that felt impelled to gather for any purpose where this was not an absolute necessity would be all the more likely to do so on other occasions also. Perhaps, therefore, were the bullfinch in numbers sufficient to put heart, as one may say, into

¹ *Fauna of N. Wales.*

³ *Birds of Oxfordshire.*

² *Birds of Northamptonshire.*

⁴ F. C. Kelley, *Ornis Carinthiæ.*

his latent social proclivities, he would flock in a much more respectable manner. Obviously a few small family parties scattered over a wide area would have far less opportunity of joining one another than were they multiplied twenty or thirty fold.

Possibly in the hawfinch we may have a further illustration of this principle. In autumn and winter it is seen, sometimes in family parties, sometimes in flocks,¹ and it seems probable that the preponderance of the one or the other, as well as the numbers of the latter, depend on its relative abundance in this or that district. The largest gathering recorded, however²—viz., two hundred—was in the days of Yarrell,³ which, at first sight, does not seem in accordance with the view that at that time the bird was much scarcer amongst us than it now is. Such a fact, however, might be due to a migratory irruption bearing no relation to the resident population. In 1880 a flock of one hundred hawfinches was recorded, whilst the smallest mentioned is fifteen. The conclusion, if one is justified in drawing any from these somewhat scanty data, would seem to be that where there are so many as one hundred, or two hundred, birds, to flock together, they will so flock if it lies in their way to do so, that is, if they be sufficiently thickly sown, as one may say, over the country, but not otherwise. Should the reason here suggested, namely, the lesser abundance of the species, be not sufficient to explain the more restricted nature of their social gatherings, then we must look upon both the hawfinch and bullfinch, but more especially the latter, as being less gregarious than the other members of the family, or than the generality of them. Yet surely numbers themselves should have a strong influence in the making of a species either social or solitary.

Whatever may be their numbers, these hawfinch gatherings would seem to be homogeneous. Indeed of all finches—excepting the bullfinch, who is also very exclusive—the hawfinch, perhaps, may most be said to stand alone. He is sufficient unto himself, needing no other.

¹ Yarrell, Seeböhm, Macgillivray, each in his respective *History of British Birds*.

² As far as I am aware.

³ See his *History of British Birds*.

Plate 18
Hawfinch (Male)
By G. E. Collins

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The greenfinch mingles with the sparrow, and the sparrow with the chaffinch, either in flocking or roosting, or, with the goldfinch and brambling, all may descend upon the straw-stack, but not *Coccothraustes*—one does not see him in such company.

To say truth, *Coccothraustes*, though the largest of our finches, is a bird that I have found it difficult to see at all. He is indeed a shy and quiet haunter of wood and plantation, and 'tis but seldom that his masterly method of dealing with cherry-stones, which he almost romantically loves—whereby, as by magic, and with scarce an effort, the two halves fall, one on each side of his bill¹—can be observed to full edification. For myself, I am inclined to think that such economic harm as he *may* do² is done abroad—for which who, born a Briton, shall blame him?—and that, in a country so public and bustling as this, his shyness keeps him mostly to the woodlands, where, upon beech-nuts, berries, and the like, he innocently feeds.³ And let the cherry-cultivator remember this, that he does not, strictly speaking, eat cherries—he cares only for their stones. Nay, it is not even these that he really wants, but only the kernels inside them. Upon the fruit which surrounds both he has no designs. To him it is mere pulp, and he rejects it, however luscious, as scrupulously as does the greenfinch or goldfinch the tasteless husk of a wheat- or barley-

¹ Naumann, *Naturgeschichte der Vögel Mitteleuropas*, iii. The curious horny plates or "crushing-pads," situated inside the bill of the hawfinch, have been described, figured, and designated by Mr. Pycraft, their discoverer, in *British Birds*. They would appear to be for the express purpose of crushing the hard shells of seeds, so that one might doubt the accuracy of Naumann's description of the bird's *apparent* bisection of cherry-stones, were it not obviously from frequent personal observation. Assuming the use of the "pads," then whilst in the crossbill there is a special apparatus for obtaining such seeds of plants, in their entirety, as are soft but not easy to extract, the hawfinch has another for getting at the kernel of hard ones, the procural of which presents no difficulty. In neither case does the shape of the bill appear to me to be the *main* feature.

² In an important editorial note to the *Vögel*, Dr. Carl Hennicke points out that "not only does the hawfinch feed its young entirely on insects," but that "these are the exclusive food of the parents also, during the spring and early summer." "Marry, well bethought!" and the good thus done must be largely in excess of such toll as the poor bird sometimes takes of peas or cherries, thrust ostentatiously in its way, and for which none would wish to barter its life except such as to whom the loss of the whole bird world, unless in respect of the pleasures of blood and the table, would be no loss at all.

³ Complaints may from time to time be heard, but they are always interested, proceeding, as they do, from a class of beings—market-gardeners and the like—who are the natural enemies of all bird life.

grain. He is equally careful with the berries of the hawthorn, from his supposed taste for which, but really for their kernels, he perhaps has his name, or with those—still redder or more luridly so—of the yew, amidst whose funereal branches he will sometimes cling head-downwards, like a tit. He then presents an imposing appearance, yet more so, perhaps, when he stands, stately, beside his nest, before mounting it, whereby it assumes the appearance of a throne.

Indeed, were it not for the crossbill, with his uniqueness and right royal livery, the hawfinch, at least in these kingdoms, might well be called King of the Finches. His size, his dignity, his build, his bill, his colouring—subdued yet rich—above all, his name, *Coccothraustes*, would else, I think, fully entitle him to that dignity. Whether he has ever aspired to it, but unsuccessfully, or been deposed even—in 1251 possibly, the year of his rival's invasion—is a further question; but I sometimes think he looks melancholy, and I know that, year by year, he broods. It may be said that, in this respect at any rate, he does not stand alone amongst finches, or even amongst birds as a class. I defer my answer to another occasion, there being no longer space for it here.

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