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Sir John Richardson (1787–1865), surgeon, naturalist and Arctic explorer, went on Sir John Franklin's first two Arctic expeditions as ship's doctor and naturalist, and made observations and collected a large number of plant and animal specimens from the Canadian Arctic. On his return to England after the second expedition he began to write this four-volume work of natural history, first published between 1829 and 1837. A volume is dedicated to each of the classes of mammal, bird, fish and insect, which are found in the Canadian Arctic. This work is an interesting example of pre-Darwinian natural history, full of detailed descriptions of the appearance, anatomy and behaviour of the different species. Volume 2 was first published in 1831 and focuses on the species of birds found in the Canadian Arctic. It was co-authored with naturalist and illustrator William Swainson (1789–1855) and contains many illustrations.

Fauna Boreali-Americana; or The Zoology of the Northern Parts of British America

Volume 2: The Birds

John Richardson
Assisted by William Swainson
and William Kirby

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FAUNA

BOREALI-AMERICANA.

PART SECOND,

CONTAINING

THE BIRDS.

FAUNA

BOREALI-AMERICANA;

OR THE

ZOOLOGY

OF THE

NORTHERN PARTS

OF

BRITISH AMERICA:

CONTAINING

DESCRIPTIONS OF THE OBJECTS OF NATURAL HISTORY COLLECTED ON THE LATE NORTHERN LAND EXPEDITIONS UNDER COMMAND OF CAPTAIN SIR JOHN FRANKLIN, R.N.

PART SECOND,

THE BIRDS.

BY

WILLIAM SWAINSON, Esq., F.R.S., F.L.S.,

HONORARY OR CORRESPONDING MEMBER OF SEVERAL FOREIGN SOCIETIES.

AND

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SURGEON AND NATURALIST TO THE EXPEDITIONS.

ILLUSTRATED BY NUMEROUS PLATES AND WOODCUTS.

PUBLISHED UNDER THE AUTHORITY OF THE RIGHT HONOURABLE THE SECRETARY OF STATE FOR COLONIAL AFFAIRS.

LONDON:
JOHN MURRAY, ALBEMARLE-STREET.

MDCCCXXXI.

ADVERTISEMENT.

MR. SWAINSON'S contributions to the following pages have the letters Sw. subjoined, except in one or two instances, where they have been accidentally omitted. It is to be understood, however, that all the remarks on natural arrangement are his, and that the specific names and synonymes are given on his authority, having been either supplied or revised by him.

In the descriptions, "Werner's Nomenclature, by Syme," has been adopted as the standard for the names of the colours, the specimens having been invariably compared with the coloured patterns previous to noting down the hue of the plumage. The measurements are in inches and lines, or twelfth parts of an inch. The total length of the bird is measured from the tip of the bill to the end of the tail, the neck being on the stretch. In the FALCONIDÆ and STRIGIDÆ, the length of the longest quill when plucked from the wing is given; but this having been found inconvenient in practice, the length of the folded wing from the tip of the longest feather to the bend of the carpal joint is recorded in the descriptions of the succeeding families. The dimensions of the bill are generally taken both from the feathers of the forehead, following the curve of its ridge,—and from the rictus or angle of the mouth, in a straight line to the tip. The tail is measured from its extremity to the insertion of the quills in the coccyx; and in the length of the tarsus are included its articular cartilages; that is, the points of the compasses were placed in the centres of the tarsal and metatarsal joints. The lengths of the toes are given separately from the nails.

THESE LISTS ARE SUBJOINED, THAT THE ORNITHOLOGIST MAY KNOW WHERE TO FIND THE SPECIMENS DESCRIBED IN THE FOLLOWING PAGES.

Presented to the ZOOLOGICAL SOCIETY *by order of the Right Hon. the Secretary of State for the Colonies.*

Aquila chrysaëta. Haliæetus leucocephalus. Circus cyaneus. Strix cinerea. Bubo Virginianus. B. arcticus. Strix funerea. Strix Tengmalmi. Lanius borealis. L. excubitorides. Tyrannus intrepidus. Tyrannula Saya. Tyr. pusilla. Tyr. Richardsonii. Cinclus Americana. Merula minor. M. Wilsonii. M. solitaria. Orpheus meruloides. O. rufus. O. felivox. Sialia arctica. Sylvicola æstiva. S. maculosa. S. petechia. S. striata. Vermivora rubricapilla. V. peregrina. Setophaga Bonapartii. Parus atricapillus. Seiurus aurocapillus. S. aquaticus. Anthus aquaticus. Vireo olivaceus. Bombycilla Americana. Alauda cornuta. Plectrophanes Lapponica. P. picta. Emberiza pallida. Fringilla leucophrys. F. Pennsylvanica. F. iliaca. F. hyemalis. Pipilo arctica. Loxia leucoptera. Fringilla purpurea. Linaria tephrocotis. L. minor. Agelaius xanthocephalus. Scolecophagus ferrugineus. Garrulus brachyrhynchus. Picus tridactylus. P. arcticus. Troglodytes ædon. Tr. hyemalis. Tr. palustris. Hirundo Americana. H. lunifrons. Tetrao obscurus. T. Canadensis. T. Franklinii. T. saliceti. T. rupestris. T. leucurus. T. phasianellus. Strepsilas interpres. Grus Canadensis. Ardea lentiginosa. Numenius Hudsonius. N. borealis. Tringa Douglasii. T. alpina. T. Schinzii. Totanus semipalmatus. T. vociferus. T. flavipes. T. Bartramius. T. chloropygius. Limosa Hudsonica. Scolopax Novoboracensis. Sc. Drummondii. Rallus Carolinus. Fulica Americana. Phalaropus Wilsonii. Podiceps cornutus. Sterna nigra. Larus glaucus. L. zonorhynchus. L. brachyrhynchus. L. Franklinii. L. Bonapartii. Lestris Richardsonii. Anas discors. Mareca Americana. Oidemia perspicillata. O. fusca. Fuligula Vallisneria. F. ferina. F. rufitorques. F. rubida. Clangula Barrovii. Cl. histrionica. Harelda glacialis. Mergus cucullatus. Colymbus glacialis. C. septentrionalis. [In all 130 specimens.]

Presented to the Museum of the University of Edinburgh.

Accipiter palumbarius, *male & fem.* Buteo borealis. B. lagopus. Circus cyaneus, *male, fem. & young.* Strix otus. S. brachyota. S. cinerea. S. Virginiana. S. funerea. S. Tengmalmi. Tyrannus intrepidus. Tyrannula Saya. Cinclus Americanus. Merula migratoria. M. Wilsonii. Sylvicola maculosa. Setophaga ruticilla. Parus atricapillus. Anthus aquaticus. Bombycilla garrula. B. Americana. Fringilla leucophrys. F. Pennsylvanica. F. graminea. Pipilo arctica. Dolichonyx oryzivorus. Agelaius phœniceus, *male & fem.* A. xanthocephalus. Sturnella Ludoviciana. Icterus Baltimore. Quiscalus versicolor, *male & fem.* Scolecophagus ferrugineus, *male & fem.* Corvus corone. C. pica. Picus pileatus. P. villosus, *male & fem.* P. pubescens. P. varius. P. arcticus. P. tridactylus, *male & fem.* Colaptes auratus, *male & fem.* Caprimulgus Virginianus. Hirundo purpurea. Alcedo alcyon. Tetrao umbellus, *male & fem.* T. obscurus. T. Canadensis, *male, fem., & young.* T. saliceti, *spring* and *wint.* T. leucurus, *summer* and *wint.* T. phasianellus. Charadrius vociferus. C. pluvialis. Strepsilas interpres. Ardea lentiginosa. Tringa Douglasii. T. Schinzii. Totanus semipalmatus. T. vociferus. T. flavipes. T. Bartramius. T. chloropygius. Limosa fedoa. L. Hudsonica. Rallus Carolinus. Phalaropus Wilsonii. P. hyperboreus. Podiceps cornutus. Sterna nigra. Larus zonorhynchus. L. Franklinii. L. Bonapartii. Anas clypeata, *male & fem.* A. strepera. A. crecca. A. discors, *fem. & young.* Mareca Americana. Oidemia perspicillata, *male & young.* O. fusca. Fuligula Vallisneria, *male & fem.* F. marila. F. rufitorques, *male & fem.* F. rubida. Clangula vulgaris, *male & young.* C. albeola, *male & fem.* Harelda glacialis, *male & fem.* Mergus merganser. M. cucullatus.—86 species, in addition to 40 specimens collected on the *first* Expedition, and also preserved in the Edinburgh Museum.

Twelve specimens were likewise sent to the Plymouth Museum, pursuant to his Majesty's commands; and between 70 and 80 species have been presented to Mr. Swainson, by permission of the Right Hon. the Secretary of State for Colonial affairs*.

* Mr. Swainson has deposited specimens from his own collection, of the true *Vireo olivaceus* and *Tyrannula rapax*, in the British and the Edinburgh Museums. To the former he has also sent *Vireo Bartramii.*

TABLE OF CONTENTS.

N. B.—For a systematic List of the Species, with reference to the pages, see Table I., Introduction, p. xxii.

LIST OF PLATES.

* Continued from the First Volume.

LIST OF WOOD-CUTS,

Representing *parts* of the following birds.

ERRATA

IN THE NAMES OF THE PLATES IN SOME IMPRESSIONS.

Plate.	Page.	
29 ..	55,	for "CYANCUS," read "CYANEUS."
37 ..	184,	(MERULA SOLITARIA,) for "Pl. 35," read "Pl. 37."
46 ..	146,	for "ACADICA. NUNCIOLA," read "PUSILLA. RICHARDSONII."
61 ..	348,	for "TETRAO CANADENSIS," &c. read "TETRAO FRANKLINII."
62 ..	346,	dele "*Dar.* et *T. Franklinii Doug.*"
66 ..	380,	for "DOUGLASSII," read "DOUGLASII."

To the Binder.—This slip to be pasted in opposite the List of Plates.

INTRODUCTION

TO THE

SECOND VOLUME;

BY

DR. RICHARDSON.

SCIENCE is indebted to the exertions of the Hudson's Bay Company for almost all that is known of the Ornithology of the American Fur-countries; under which term we comprehend generally *the whole country north of the forty-eighth parallel of latitude*. The French Canadians were the first, indeed, who penetrated into the regions beyond the Great Lakes in pursuit of peltry; but the few journals of their proceedings that have come down to us, though rich in personal adventure, contribute nothing to Natural History, beyond incidental anecdotes of the animals that are objects of chase. In like manner, the earlier English navigators, who, in exploring Hudson's Bay and the Arctic Seas, aided in laying the foundation of the naval glory of their country, limited their notes on Zoology to brief remarks on the animals used for food, but seldom or never gave descriptions sufficiently characteristic to identify the species.

The first collections of Hudson's Bay birds of which I can find any record, are those formed by Mr. Alexander Light, who was sent out, ninety years ago, by the Hudson's Bay Company, on account of his knowledge of Natural History; and by Mr. Isham, who, during a long residence, as Governor of various forts or trading-posts, employed his leisure hours in preparing the skins of beasts, birds, and fishes. These two gentlemen returning to England, about the year 1745, fortunately for the advancement of Ornithology, entrusted their

specimens to Mr. George Edwards, who did them ample justice, in his splendid "Natural History of Birds*," the most original and valuable work of the kind in the English language. In the first volume, he has figured and described with accuracy *ten* of Mr. Light's birds, and in his third volume, which appeared in 1749, *thirty-two* of Mr. Isham's are equally well illustrated†.

In that year also, Ellis published his account of the voyage of the Dobbs and California, wherein he mentions some of the animals that came under his notice in the winter of 1747, which he passed in Hayes River‡; and a narrative of the proceedings of the same voyage, by Mr. Drage, Clerk of the California, is still more full on points relating to Natural History. During the next twenty years, no additional information was obtained of the Zoology of those parts; but Mr. William Wales having been sent to Hudson's Bay, in 1768, to observe the transit of Venus, Mr. Graham, Governor of the Company's post at Severn River, embraced the opportunity afforded by his return to England, of transmitting a collection of quadrupeds, birds, and fishes to the Royal Society. These being described by John Reinhold Forster, in the Philosophical Transactions for 1772§, excited the attention of the scientific world; and, by desire of the Royal Society, directions were given by the Governor and Committee of the Hudson's Bay Company that objects of Natural History should be annually sent to England. Mr. Humphrey Martin, accordingly, sent home several hundred specimens of animals and plants, collected at Albany Fort, of which he was Governor; and Mr. Hutchins, who succeeded him in that office, was still more industrious,

* Edwards presented a copy of this work, coloured by his own hand, to the Royal Society; and another copy, which he sent to Linnæus, returning to England again when Sir James Smith acquired the invaluable museum and library of that prince of naturalists, is now in the possession of the Linnean Society. The Linnean specific names are added to it in manuscript.

† In four instances Edwards devotes separate plates to the males and females, which reduces the number of species of birds from Hudson's Bay, introduced into his work, to *thirty-eight*.

‡ York Factory is situated on the alluvial point of land which separates this river from the more important stream of Nelson's River, and is the place where the principal part of the *waders* and *water-fowl* collected on Sir John Franklin's first Expedition were procured.

§ The species of birds enumerated by Forster are fifty-seven, of which twenty-two had been previously made known by Edwards; while sixteen, figured by the latter, do not enter Forster's list.

not only in preparing many specimens, but in drawing up minute descriptions of all the quadrupeds and birds he could obtain, adding their native names, with notices of their nidification, food, and habits. His observations *, which, in fact, embrace almost all that has been recorded of the habits of the Hudson's Bay birds up to the present time, being communicated to Latham and Pennant, are incorporated in the "General Synopsis of Birds," and in "Arctic Zoology." Indeed, Pennant, in some instances, appears to have adopted Mr. Hutchins's descriptions, though unaccompanied by specimens, prefixing the names of nearly-resembling European birds, which an actual comparison would have shown to have been quite distinct; and in this way several species have been enumerated in systematic works as natives of Hudson's Bay, which do not actually exist there. On the other hand, Mr. Hutchins has distinctly noticed a few species which have been but very lately admitted into the ornithological systems.

Captain Cook's third voyage, in 1777-8, contains some information respecting the animals of the north-west coasts of America and Behring's Straits, but, unfortunately, no figures of the birds were published; and the compendious notices which are contained in the works of Pennant and Latham, defective as they are in details of structure, are, in many instances, insufficient to enable us to identify the species, or to ascertain their proper situation in the system. The specimens themselves, collected on this and Cook's other voyages, of unrivalled extent and interest, which ought to have been carefully preserved for reference in a national museum, have either gone to enrich foreign collections, or are entirely lost to science.

Pennant's "Arctic Zoology," which appeared in 1785, contains the fullest account of the birds of Arctic America which has hitherto been published. It embraces the species introduced by Latham in his "Synopsis," which was then in course of publication; but, in common with other ornithological works of that period, it includes many specific names, attached merely to a different state of plumage,

* In one volume folio, in the Library of the Hudson's Bay Company.

resulting from age or sex. Exclusive of these *nominal* species, Pennant describes seventeen from the north-west coast and Behring's Straits, collected on Captain Cook's Expedition, and eighty-three from Hudson's Bay, of which seventy-three had been previously made known by Edwards and Forster. Umfreville's "Account of Hudson's Bay," and Hearne's "Journey to the Coppermine River," published in 1795, give some interesting details of the habits of the more common birds.

There is no evidence in the Philosophical Transactions, of the orders of the Hudson's Bay Company, in 1772, above alluded to, having been beneficial to science through the channel of the Royal Society; but their instructions served to acquaint the residents with the value set, in England, upon the natural productions of the northern regions; and collections, chiefly of birds, have continued to be transmitted annually to London up to the present time, as presents either to the Governor and Committee or to the personal friends of the parties. The former, besides forming a museum of the Hudson's Bay productions, which is liberally open to the public, have presented numerous specimens to the British Museum and Zoological Society. Private museums have also been greatly enriched from these sources, among which that of Joseph Sabine, Esq., is particularly deserving of notice. This gentleman has long studied the Ornithology of Hudson's Bay, and it is to be regretted that he has hitherto laid before the public only a part of the extensive information he has acquired on the subject. His Appendix to the Narrative of Sir John Franklin's *first* Journey shows how well he could have performed the task had he found leisure. He has lately transferred his rich museum to the Andersonian Institution of Glasgow. Mr. Leadbeater's invaluable collection also contains an extensive suite of birds from Hudson's Bay, some of which have been recently figured in the American Ornithology of the Prince of Musignano, and are among the most interesting novelties in that splendid work.

The voyages of Vancouver, Portlock, Meares, and Langsdorff, to the north-west coast, added little to Ornithology; nor is there much cer-

tain information to be derived from the notices of Lewis and Clark of the birds they saw on the banks of the Columbia. They were unable to bring many specimens across the mountains, and their descriptions are in general too vague for scientific purposes, which is, perhaps, attributable to the untimely death of Governor Lewis previous to the publication of the work.

All this, however, would have been compensated by the indefatigable researches of Mr. David Douglas, which would have made the birds of the north-west coast equally familiar to Europeans with those of Hudson's Bay, had not his extensive collections gone to decay, through the length of the voyage and other causes beyond his control. He is now a second time exploring that interesting country, and we look with much anxiety for the rich harvest he is sure to reap.

Eschscholtz and Chamisso, the naturalists who accompanied Kotzebue on his voyages to the Russian-American settlements and Behring's Straits, doubtless acquired a knowledge of the birds of the places they visited; but only some detached notices of their discoveries in Natural History have as yet reached this country. The more recent voyage of Captain Beechey has also been productive of much advantage to natural science; and I rejoice that Mr. Vigors has undertaken the task of bringing the ornithological discoveries before the public *.

Almost the only information we have of the birds of the extreme northern coasts of America is contained in the Natural History Appendices to the voyages of Ross and Parry. Having had access to many of the specimens procured on these voyages, and preserved in the British and Edinburgh Museums, I have described them in the present work †.

* I should gladly have availed myself of the kindness of the Author, who entrusted me with the proof-sheets, to have rendered this work more complete, by giving a list of the species that frequent the north-west coast; but very few of the specimens brought home on that Expedition had notes attached to them to indicate their locality, so that the native places of many are uncertain.

† I embrace the opportunity here afforded of again returning my sincere thanks to Charles König, John George Children, and John Gray, Esqrs., of the British Museum; to Robert Jameson, Esq., Regius Professor of Natural History in the University of Edinburgh; and Nicholas Aylward Vigors, Esq., Secretary to the Zoological Society; for the great facilities they have invariably afforded me of

As the specimens obtained on Sir John Franklin's two Expeditions furnish almost the whole of our authentic information of the Ornithology of the *interior* of the Fur-countries, it remains that I should add to the preceding brief notice of the sources of our knowledge of the feathered tribes that frequent the *coast line* of *Arctic America* a few remarks on the *circumstances under which the collections were made*. The reader will thus be better enabled to form some opinion on the proportion which the species described in this work bear to the whole that frequent the Fur-countries.

In the first place, I have to state that, in neither Expedition, did Ornithology occupy much of our attention. The want of means of transport for bulky packages in the overland marches, and the difficulty of preserving from injury recent specimens of birds, on the numerous carrying places which occur on the canoe route, induced us to devote the whole of our spare time during the journey to Botany and Mineralogy. As the entire summer of each year was spent in travelling, we did not reach our winter quarters until after almost all the migratory birds had retired to the southward. Nothing could, therefore, be done beyond securing examples of the few resident birds, until the following spring, when the interval of a month or six weeks, which occurred between the first melting of the snow and the commencement of the summer journey, was devoted almost exclusively to collecting birds. Many of the specimens were shot by the other officers, but they were all prepared by Mr. Drummond or myself.

The collection made on the *first Expedition* was formed in the several springs of 1820, 21, and 22, on the Saskatchewan, at Fort Enterprise, and on Great Slave Lake respectively; and in the autumn of 1822, at York Factory (lat. 57°), Hudson's Bay. We arrived at the latter place on the 14th of July; and betwixt that date and our departure for England, in the beginning of September, we had an opportunity of

consulting the museums under their charge, and the desire they have constantly manifested of furthering my researches by every means in their power. I am, likewise, under many obligations for similar kindnesses to the Governor, Deputy-Governor, and Committee of the Hudson's Bay Company, and to Mr. Smith, their Secretary; and also to William Yarrell, Esq., and Mr. Leadbeater, for the liberal access they have given me to their collections.

obtaining a very considerable number of birds, chiefly *waders*, which assemble in flocks at the mouth of Hayes River, previous to taking their departure southwards on the setting in of the frost *. Mr. Sabine, who wrote the Zoological Appendix to the Narrative of that Expedition, notices seventy-one species of birds. Want of leisure, however, caused him to omit several of the waders, and a portion of the collection never reached him, being lost after its arrival in England.

On the *second Expedition* specimens of birds were collected at Fort Franklin, on Great Bear Lake, in the spring of 1826, between the 8th of May and 14th of June, being the periods of the first arrival of the migratory birds and the commencement of our voyage to the coast; and, in 1827, the months of April and May and one-half of June were devoted to the same purpose at Carlton and Cumberland House, on the banks of the Saskatchewan. Having the able assistance of Mr. Drummond in the latter period, the bulk of the collection was then formed. Mr. Drummond also shot two or three species on the declivity of the Rocky mountains that were not seen elsewhere; and a very few were prepared in the course of our summer journeys.

It is evident, from the short time allotted to the task, that we could hope to obtain only the more common birds. The Prince of Musignano enumerates a somewhat greater number of species in his Synopsis of American Birds, than those contained in Temminck's Manual of European Ornithology; and as the country we traversed north of the Great Lakes exceeds in extent the whole of Europe lying higher than the forty-eighth degree of latitude, we shall not, perhaps, err greatly in ascribing to the Fur-countries as great a variety as Europe presents within the same parallels.

The present work contains two hundred and forty species, and above twenty-seven in addition are described by Pennant and Vigors

* This was the only autumn collection made on either Expedition, and we regret that we have not been able to avail ourselves of it, so much as we could have wished, in drawing up the present work. Exclusive of the specimens above alluded to as having been entirely lost, many were destroyed by moths in London; and the only portion of the collection which I can now trace are forty specimens, which were presented to the Museum of the University of Edinburgh, and are still in good order.

as inhabitants of the north-west coast*, making in all two hundred and sixty-seven. Now, according to Temminck's Manual, there are three hundred and twenty-six† birds which range in Europe to the northward of the forty-eighth parallel; so that the number of species that remain to be detected in the Fur-countries will not, probably, much exceed sixty; and we have some reasons, connected with the circumstances under which the collections were made for believing, that the majority of these will prove to belong to the families of *Sylviadæ*, *Fringillidæ*, and *Charadriadæ*. Several of the *Procellariæ* are also known to inhabit Hudson's Bay and the Arctic Sea; but, from our want of means of identifying the species, they have been omitted.

The same causes that tended to limit our means of collecting operated, together with my previous ignorance of Ornithology, to prevent my recording the habits of the species to the extent and with

* List of species that frequent the north-west coast of America, from Pennant's *Arctic Zoology*; with references to those described in this work:—

No.
139 Steller's Crow, *Nootka Sound.* (*Garrulus Stelleri*, Sw., p. 294, hujus operis.)
151 Unalaschka Oriole.
160 Red-headed Woodpecker. (*Melanerpus erythrocephalus*, p. 316.)
168 Three-toed ditto, *Norton Sound.* (*Picus* (*Apternius*) —— ? p. 311 ? 313 ?)
169 Belted Kingfisher. (*Alcedo alcyon*, p. 339.)
177 Ruffed Honey-sucker, *Nootka.* (*Trochilus* (*Selasphorus*) *rufus*, p. 324.)
186 Norton Sound Bustard.
197 Varied Thrush. (*Orpheus meruloides*, Sw., p. 187.)
202 Unalaschka Thrush.
207 Chatterer, lat. 64° 30′. (*Bombycilla garrula*, p. 237.)
229 Unalaschka Bunting. (*Fringilla arctica*, VIGORS, *Beechey's Birds*, p. 20 ?)
230 Black-crowned ditto, *Nootka Sound.*
232 Unalaschka ditto (second species).
251 Ferruginous Finch, (a variety,) *Unalaschka.*
256 Norton ditto.

No.
260 Cinereous Finch.
381 Black Snipe. (STELLER.)
394 Gambet Sandpiper, lat. 69½°.
397 Little ditto, *Nootka Sound.*
413 Tringa fulicaria. (*Phalaropus fulicarius*, p. 407.)
415 Plain phalarope. (p. 408.)
430 Antient Auk.
432 Tufted ditto. (*Mormon cirrhatus*, BON., *Syn.*, No. 378.)
431 Pigmy ditto, *Behring's Straits.*
433 Perroquet ditto, } *ditto.* (*Phaleris psitaccula*, BON.,
435 Dusky ditto, } *Syn.*, No. 376.)
434 Crested ditto, *ditto.* (*Phaleris cristatella*, ID. p. 426.)
436 Marbled Guillemot. (*Uria marmorata*, ID. No. 372.)
457 Ivory Gull, *Behring's Straits.*
463 Fork-tail Petrel, *ditto.*
473 Bering Goose. (STELLER.)
497 Western Duck.
510 Gannet.
534 Giant Petrel.

The Prince of Musignano and Mr. Vigors give, in addition to the above,

Charadrius pluvialis, *Chamisso Island.* (p. 369.)
Mormon glacialis, *Behr. Straits.* (BON., *Syn.*, No. 379.)
Cerorhinca occidentalis, *ditto.* (ID.)
Larus Sabinii, *Behr. Straits.* (p. 428)
Diomedea fuliginosa, *Aleutian Islands.* (VIG., *Beechey's Birds*, p. 89.)

Lewis and Clark, and the authors we have mentioned in the text, indicate several others.

† The whole number of European birds described in Temminck's Manual is three hundred and eighty, of which two hundred and thirty-five are land-birds. Bonaparte's Synopsis of the Birds of the United States contains three hundred and eighty-two species, of which two hundred and fifteen are land-birds; and one hundred and sixty-seven belong to the orders of Grallatores and Natatores.

the accuracy required for the purposes of science. With the view of obviating this defect in some degree, and of rendering the work more popular, I began by introducing occasional extracts from the lively and accurate pen of Wilson. I soon found, however, that a continuance of this practice would have swelled the work to an undue size, and have left no room for Mr. Swainson's important and interesting observations on natural arrangement. It was, therefore, laid aside; and, at the suggestion of Mr. Swainson, the succeeding descriptions were much and advantageously compressed *.

The discovery of the laws which regulate the distribution of the species over the face of the globe, being one of the most important ends of the publication of local *Faunæ*, the scanty contributions of facts that we have been enabled to make are thrown, for the greater facility of reference, into a tabular form. The New World is peculiarly adapted for researches of this kind; its two extremities, and almost every intermediate zone, are accessible, and, it is to be hoped, will hereafter be minutely investigated for the purposes of natural science. When accurate lists of the resident birds in each region, and of the summer and winter visiters, are obtained, many highly interesting and unexpected deductions will doubtless be made, and much theoretical reasoning exploded. The Prince of Musignano has performed a great service to science in furnishing such a list for the neighbourhood of Philadelphia †, of which we have availed ourselves in the construction of the following table. Had it been in our power to have drawn up an equally complete list for the Fur-countries, the general movements of the feathered tribes through North America would have been rendered apparent.

Birds are usually divided into migratory and resident, though comparatively few in the Fur-countries are strictly entitled to the latter appellation. The *Raven* and *Canadian* and *Short-billed Jays* are, indeed, the only species which we recognized as being equally nume-

* The announcement at this period of two editions of Wilson's inimitable work, by different editors, at a price which will place them within the reach of every ornithologist, was a further inducement to us to abstain from borrowing from it.

† Specchio Comparativo delle Ornitologie di Roma e di Filadelfia, di C. L. Bonaparte, Principe di Musignano. Pisa. 1827.

rous at their breeding-places in winter as in summer; and they pair and begin to lay eggs in the month of March,—nearly three months earlier than any other bird in those quarters.

The distribution of the migratory and resident birds is evidently governed, as far as climate is concerned, by very different laws. The *winter temperature*, regulating the depth and duration of the snow and ice, and consequently the supply of vegetable productions, insects or fish at that season exerting a principal influence on the number of resident birds, whose distribution may be considered as bearing much analogy to that of quadrupeds. While the influx of migratory birds into the northern regions for the purpose of rearing their young is more connected with the high summer temperature of those parallels, the mean annual heat, which is very low, being no criterion as to the number or variety of summer visiters *.

* The following Table gives a view of the temperatures of various stations in North America, the extremes being forty-five degrees of latitude apart. Our limits do not admit of the Table being more extended, but the reader who wishes to enter fully into the subject, may consult Dr. Lovell's valuable tables, appended to the Narrative of Long's Expedition to St. Peter's River, from which the temperatures for Fort St. Philip and Philadelphia have been extracted, and the Edinburgh Philosophical Journal for April, 1825, or the Appendices to Sir Edward Parry's and Sir John Franklin's several Narratives, which furnished the materials for the rest of the Table. It may be observed, that the mean annual temperature decreases as we advance northwards $1\frac{1}{2}^{\circ}$ F. for each degree of latitude, while the decrease of mean heat in July does not exceed 1°. The three last lines are omitted in this calculation, as the observations recorded in them were made among fields of ice, which reduce the summer temperature greatly below what it is even a few miles inland. The snow is perpetual in no part of the Fur Countries, except on the elevated peaks of the Rocky Mountains.

Places.	Position.			Mean temperature of the Air.				*Max.* in the Year.	*Min.* in the Year.
	Lat. N.	Long. W.	Height above the Sea in feet.	*Annual.*	*Summer.* June, July, August.	*Winter.* December, January, February.	*Warmest Month,* July.		
				Fahr.	Fahr.	Fahr.	Fahr.	Fahr.	Fahr.
Fort St. Philip	29° 29′	89° 21′	..	+70°.07	+82°.89	+54°.08	+81°.53	+92°.0	+28°.0
Philadelphia	39 57	75 9	..	+53.38	+72.75	+29.77	+75.32	+87.0	−0.7
Penetanguishene	44 48	80 40	600	+45.28	+69.91	+22.68	+73.15	+92.0	−20.0
Cumberland House	53 57	102 17	800	+32.01	+67.80	−4.62	+69.80	+87.0	−44.0
Fort Chipewyan	58 43	111 18	500	+30.00	+62.41	+3.67	+63.42	+97.0	−31.0
Fort Enterprise	64 0	113 6	850	+14.19	+51.71	−23.03	+53.20	+78.0	−57.0
Fort Franklin	65 12	132 13	230	+17.50	+50.40	−16.81	+52.10	+80.0	−58.0
Winter Island	66 11	83 30	..	+6.84	+35.00	−24.96	+36.34	+54.0	−42.5
Igloolik	69 19	82 30	..	+2.20	+34.63	−26.76	+40.04	+50.0	−50.0
Melville Island	74 45	111 0	..	−1.71	+36.44	−33.02	+42.41	+60.0	−55.0

The nature of the country, whether prairie or wooded, rocky and barren, or marshy, must also be taken into account in all speculations on the distribution of the feathered tribes. Several of the *Grallatores*, for instance, that feed by thrusting their bills into soft marshy soil, frequent the Saskatchewan prairies only in spring, and as soon as the warm and comparatively early summer renders the soil dry and unfit to yield them support, they retire to their breeding-quarters in the Arctic lands. There, the frozen sub-soil acted upon by the rays of a sun constantly above the horizon, keeps the surface wet and spongy during the two short summer months which suffice these birds for rearing their young. This office performed, they depart to the southward, and halt in the autumn on the flat shores of Hudson's Bay, which, owing to accumulations of ice drifted into the Bay from the northward, are kept in a low temperature all the summer, and are not thawed to the same extent with the more interior Arctic lands before the beginning of autumn. They quit these haunts on the setting in of the September frosts, and passing along the coasts of the United States, retire within the Tropics in the winter.

Many species, which are purely summer visiters of the high latitudes, are resident within certain parallels of the United States, detachments advancing to the north in the spring for the purpose of rearing their young and retiring to the south of the resident stations in winter. It is obviously very difficult to ascertain whether the individuals of these species which breed in the higher latitudes are the same that retire farthest southwards in winter, those remaining in the intermediate districts in winter being the pairs which bred there, though from analogy we are led to think that such is the case. Of the strictly resident birds in Europe it is known that many (the House-Sparrow, for instance) shelter themselves in winter in their nests and summer haunts; and of the migratory ones, the same pair have been observed to build several successive seasons in the same spot. Some species seem to claim a right of property within a certain beat, chasing away with great pertinacity all the other birds that they can master. In the instance also of the *Falconidæ* and some other

tribes, which present a marked difference in the plumage of the old and young, we observe that the latter are expelled by their parents from the breeding-places, and appear both in summer and winter in districts which none of the old birds visit. From a consideration of these and similar facts, we are inclined to believe that, of the species which are found all the year within certain parallels, the younger individuals make the widest excursions in search of food or proper breeding places, and that, as their strength is matured by age, they fill up the casual vacancies which occur in the districts best adapted for their constant residence.

A number of species, which rear two or more broods within the United States, raise only one in the Fur-countries, the shortness of the summer not admitting of their doing more. The Passenger Pigeons do not visit the Fur-countries, where they breed, until after they have reared a brood, and quitted the breeding-places in Kentucky. It is probable that some other birds also breed in succession in different districts; and it is even possible that a few of the *Falconidæ* and some species of certain families of *Grallatores*, after spending the short summer of a high northern latitude in rearing one family, may gain a similar climate in the southern hemisphere for the purpose of rearing another brood, passing, of course, nearly one half of the year in the transit to and from these breeding-places *. This hint is thrown out as simply conjectural; but, in the families to which I allude, seldom more than two young are produced at a

* I have several times, when cruizing between Minorca and Sardinia, seen large flocks of Swallows, attended by great numbers of Hawks and a very small species of Owl, holding a direct course from the coast of Africa towards the Gulf of Lyons. From the direction of their flight, it did not appear that they could have rested on any part of the islands I have just mentioned; so that the traverse they attempted was full seven degrees of latitude. Both Swallows and birds of prey appeared much tired, and settled for several days on the masts and yards of all the ships of the fleet, from whence vast numbers were taken by the crews. Having no acquaintance whatever with Ornithology at the time, I do not know the species of the small Owl, but I have a distinct recollection of its being no bigger than a Sparrow; and in this I can scarcely be mistaken, as I kept one for nearly a week before it made its escape. It was fed on Swallows, which it invariably strangled by grasping them by the neck with one foot. If a bird of this size can cross such an expanse of sea at one flight, the greatness of the distance to be traversed, according to the supposition in the text, does not seem to be of itself a sufficient reason for rejecting the hypothesis, particularly if the length of time occupied in the passage and the long halts at the various resting-places be considered.

time, which would seem scarcely sufficient to supply the waste by the numerous casualties which occur, unless more than one brood were raised in the year. Captain King found several northern birds in the Straits of Magellan.

A large proportion of the migratory birds arrive in the higher latitudes in flocks, but disperse in pairs soon afterwards; and some, as the *Emberiza nivalis* and *Lapponica*, which winter within the limits of the Fur-countries, assemble during that season in large flocks, but separate when they reach their breeding-places. *Parus atricapillus* and *Linaria minor* live in small families in the winter only; the *Tetraonidæ* form coveys of ten or twelve in summer and the middle of winter, but make their spring and autumn movements to and from their breeding-places in great assemblages. The *Corvus corax* congregates only in the pairing season, in the beginning of March, when as many as fifteen or twenty may be seen together for a few days, until each has chosen a mate. Many of the *Sturnidæ*, the *Columba migratoria*, and *Pelecanus onocrotalus* fly in dense flocks all the summer. The *Hirundinidæ* and *Laridæ* breed in societies, and hunt for their food in numbers together; but they do not appear to move in concerted flights, like the birds we have last mentioned. The *Anatidæ*, again, feed together, but generally make their nests in remote and solitary spots.

The following Table requires no explanation. The fourth column is taken from the Prince of Musignano's work above alluded to (p. xvii.), and the fifth column is filled up on the authority of that naturalist, Wilson, Audubon, and some others. A partial analysis of this Table is given in the succeeding ones.

TABLE

No.	Species, numbered as in the Fauna.	Extreme northern range. Distribution in the Fur-countries. Whether resident or migratory.
	VULTURIDÆ, p. 1.	Lat. N.
1	Sarcoramphus Californianus	49° West of Rocky Mountains . *migr.*
2	Cathartes aura	54 Plains of Saskatch. and Columbia *migr.*
3	,, atratus	48 West of Rocky Mountains . *migr.*
	FALCONIDÆ, p. 8.	
4	Aquila chrysaëta	66 On and near Rocky Mountains *migr.*
5	,, (Haliæëtus) leucocephala	62 Across the continent; common . *migr.*
6	,, (Pandion) haliæëta	60 East of Rocky Mountains *migr.*
7	Falco peregrinus	74 Across the continent *migr.*
8	,, Islandicus	74 East of Rocky Mountains resid.
9	,, sparverius	56 Across the continent . *migr.*
10	,, columbarius	66 ? East of Rocky Mountains *migr.*
11	,, æsalon	54 ? Ditto . *migr.*
12	Accipiter (Astur) palumbarius	68 Across the continent; common resid.
13	,, ,, Pennsylvanicus	49 Ditto rare . *migr.*
14	Buteo vulgaris	58 Ditto *migr.*
15	,, borealis	55 Ditto . *migr.*
16	,, lagopus	68 East of Rocky Mountains *migr.*
17	,, (Circus) cyaneus	68 Ditto (*Young* in high latitudes) *migr.*
	STRIGIDÆ, p. 71.	
18	Strix otus	60 East of Rocky Mountains; interior resid.
19	,, brachyota	67 Across the continent *migr.*
20	,, cinerea	68 Ditto resid.
21	,, nebulosa	53 James's Bay ——
22	,, (Bubo) Virginiana	68 Across the continent; common resid.
23	,, ,, arctica	53 Saskatchewan plains resid.
24	,, nyctea	75 Across the continent resid.
25	,, funerea	68 Ditto common resid.
26	,, Tengmalmi	60 East of Rocky Mountains; common resid.
27	,, Acadica	50 New Caledonia resid.
	LANIADÆ, p. 105.	
28	Lanius borealis	60 East of Rocky Mountains partly resid.
29	,, excubitorides	54 Ditto *migr.*
30	,, elegans	——
31	Tyrannus intrepidus	57 East of Rocky Mountains *migr.*
32	,, borealis	53 Ditto *migr.*
33	Tyrannula Saya	54 Ditto (Breeds on the Arkansas) *migr.*
34	,, pusilla	56 Ditto *migr.*
35	,, Richardsonii	60 Interior districts ditto *migr.*
	MERULIDÆ, p. 149.	
36	Cinclus Americanus	50 Rocky Mountains; common *migr.*
37	Merula migratoria	67 Across the continent *migr.*
38	,, minor	54 East of Rocky Mountains *migr.*
39	,, Wilsonii	55 Ditto *migr.*
40	,, solitaria	50 Ditto *migr.*

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Species observed on the Saskatchewan, lat. 53° to 54° N., and from 600 to 1000 miles distant from the sea-coast.	Species that frequent the vicinity of Philadelphia, lat. 40° N. (Bonaparte.)	Winter-quarters of the Species.	Page of the Fauna.
No.			
1 . . .	. . . .	California . . .	1
2 In Summer only. Scarce	In Summer. Comm. .	Southern States, South Amer.	4
3	Ditto Accidental visiter .	Ditto? ditto	6
4 Summer. Rare; accid. .	Very rare; accid. visiter	. . . .	12
5 Ditto Common .	*Resident.* Comm. .	Southern States . .	15
6 Ditto Rare .	Summer. do. . .	Towards the Tropics .	20
7 Spr. and Aut. *Of passage*	Winter. Accid. visiter .	Louisiana . .	23
8 . .	. . .	North of 54° . .	27
9 Summer. Common	*Resid.* Comm. .	West Indies, Mexico, S. Calif.	31
10 Ditto Rare	*Pass.* Spr. and Aut. Not uncom.	Mexico . .	35
11 Ditto (Breeds.) Not com.	. . . .	. . .	37
12 *All the year.* Freq. in Sum.	Rare . .	Fur-countries, North. States	39
13 . . .	Comm. . . .	California, South. States .	44
14 Summer. Not comm. .	. .	South California .	47
15 Ditto Comm. .	*Resid.* Very comm. . .	United States, Mexico, Calif.	50
16 Ditto do. .	Winter. Comm. . .	Middle States . .	52
17 Ditto Very comm.	Do. Yng. very com. (Old accid.)	South. States . .	55
18 *All the year.* Comm.	*Resid.* Comm. .	. . . .	72
19 Summer. Very comm. .	Winter. Very comm. . .	Mid. and South. States, Calif.	75
20 *All the year.* Comm.	. . . .	Fur-countries .	77
21 Not seen by us . .	*Resid.* Comm. . .	. . .	81
22 *All the year.* Comm.	Do. Rare . .	Fur-countries, Unit. St., Calif.	82
23 Ditto Very rare	. . .	Ditto . .	86
24 Winter. Accid. .	Winter. Accid. . .	Between 67° and 55° .	88
25 *All the year.* Comm. .	Do. do. . .	Fur-countries to Middle States	92
26 Ditto do.	. . . .	Ditto Canada .	94
27 Not seen by us . .	Winter. Very rare .	New Caledonia, North. States	97
28 *All the year.* Com. in Sum.	Winter. Rare . .	Fur-countr., Canada, Mid. St.	111
29 Summer. Comm. .	. . .	. . . .	115
30 . .	. . . .	. . . .	122
31 Summer. Comm. .	Summer. Very comm. .	Towards the Tropics .	137
32 Ditto One specim.	. . . .	. . . .	141
33 Ditto do. .	. . . . .	. . . .	142
34 Spring. *Of passage*	. . .	. . . .	144
35 Do. *Of passage?* .	. . .	. . . .	146
36 . . .	. . . .	Mexico . . .	173
37 Summer. Very comm. .	Winter. Very comm.; a few *res.*	Midd. and South. States, Calif.	176
38 Summer? Breeds?	. . . .	South. States . .	179
39 Ditto . .	Summer. Not rare . .	Ditto . . .	182
40 . . .	Ditto Comm. . .	Ditto . .	184

TABLE

No.	Species, numbered as in the Fauna.	Extreme northern range. Distribution in the Fur-countries. Whether resident or migratory.
	MERULIDÆ, *continued.*	Lat. N.
41	Orpheus meruloides	66° Great Bear Lake and North-west coast . *migr.*
42	,, rufus	54 East of Rocky Mountains . *migr.*
43	,, felivox	54 Ditto . *migr.*
	SYLVIADÆ, p. 200.	
44	Erythaca (Sialia) arctica	65 East of Rocky Mountains . *migr.*
45	,, ,, Wilsonii	48 Ditto . *migr.*
46	Sylvicola æstiva	68 Across the continent . *migr.*
47	,, maculosa	55 East of Rocky Mountains . *migr.*
48	,, petechia	55 Ditto . *migr.*
49	,, coronata	56 Across the continent . *migr.*
50	,, striata	54 East of Rocky Mountains . *migr.*
51	,, (Vermivora) rubricapilla	55 Ditto . *migr.*
52	,, ,, peregrina	55 Ditto . *migr.*
53	Setophaga ruticilla	58 Ditto . *migr.*
54	,, Bonapartii	55 Ditto . *migr.*
55	Parus atricapillus	65 Across the continent . resid.
56	Seiurus aurocapillus	55 East of Rocky Mountains . *migr.*
57	,, aquaticus	60? Ditto . *migr.*
58	Anthus aquaticus	60? Prairie district . *migr.*
	AMPELIDÆ, p. 232.	
59	Vireo olivaceus	55 East of Rocky Mountains . *migr.*
60	,, Bartramii	49 West of ditto . *migr.*
61	Bombycilla garrula	67 Rocky Mountains and Great Bear Lake . *migr.*
62	,, Americana	56 Middle Prairie districts . *migr.*
	FRINGILLIDÆ, p. 241	
63	Alauda calandra	58 Hudson's Bay . *migr.*
64	,, cornuta	69 East of Rocky Mountains; in flocks . *migr.*
65	Emberiza (Plectrophanes) nivalis	75 Arctic coasts, in summer . ——
66	,, ,, Lapponica	70 Ditto . *migr.*
67	,, ,, picta	54 . *migr.*
68	,, pallida	55 East of Rocky Mountains . *migr.*
69	,, Canadensis	60 Across the continent . *migr.*
70	Fringilla (Zonotrichia) graminea	57 Prairies E. of Rocky Mountains . *migr.*
71	,, ,, leucophrys	68 East of Rocky Mountains; common . *migr.*
72	,, ,, Pennsylvanica	66 Ditto ditto . *migr.*
73	,, ,, iliaca	68 Ditto . *migr.*
74	,, hyemalis	57 Middle Prairie district . *migr.*
75	Pyrgita (Pipilo) arctica	55 Saskatchewan prairies . *migr.*
76	Pyrrhula (Corythus) enucleator	60 East of Rocky Mountains; scarce . resid.
77	Loxia leucoptera	68 Across the continent . resid.
78	Fringilla purpurea	55 Ditto not common . *migr.*
79	Linaria (Leucosticte) tephrocotis	54 East of Rocky Mountains . ——
80	,, minor	68 Across the continent . resid.
81	Carduelis Americana	60 Ditto . *migr.*