

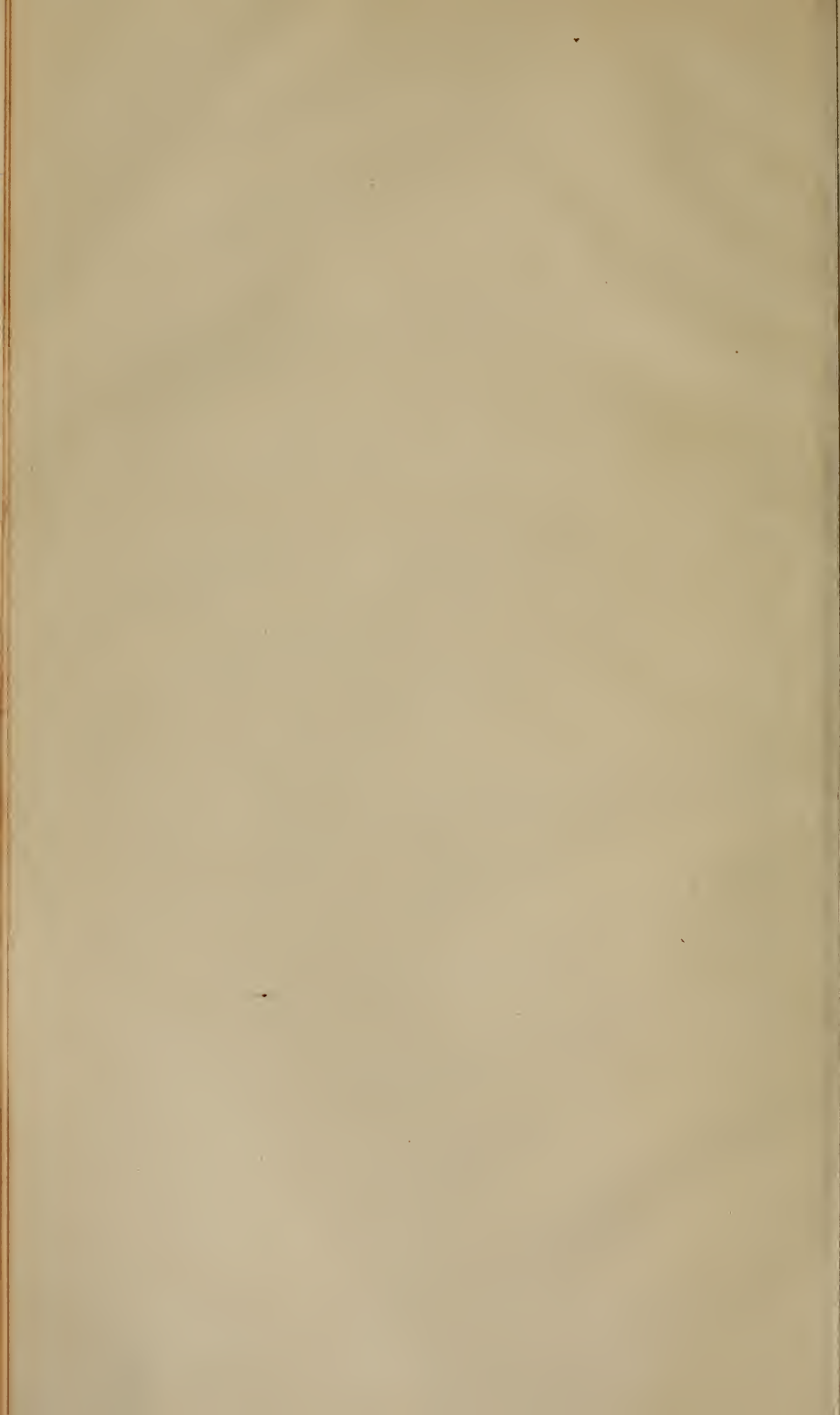
Silas Bronson Library.
Waterbury, Conn.
Bronson Fund.
Recd. March 15, 1895.

California Academy of Sciences

RECEIVED BY PURCHASE

20366





THE ZOOLOGIST:

A MONTHLY JOURNAL

OF

NATURAL HISTORY.

THIRD SERIES—VOL. XVII.

EDITED BY

J. E. HARTING, F.L.S., F.Z.S.,

MEMBER OF THE BRITISH ORNITHOLOGISTS' UNION.

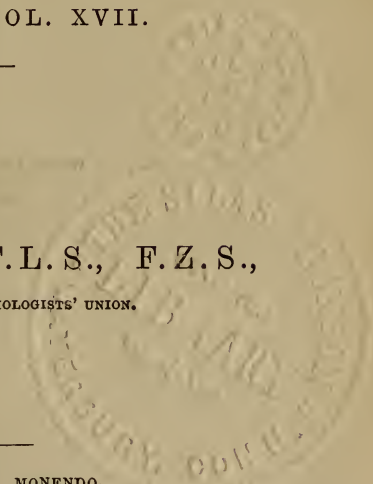
DELECTANDO PARITERQUE MONENDO.

LONDON:

SIMPKIN, MARSHALL, HAMILTON, KENT & CO., LIMITED.

1893.

20366



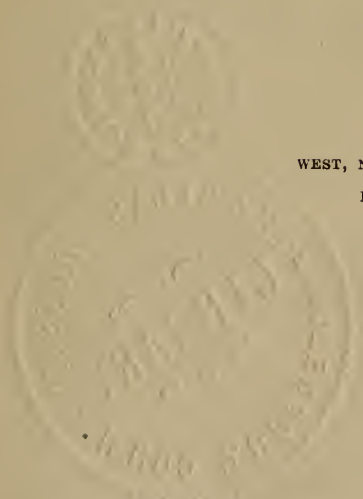
* n
5-90.997

v. 51

30443

LONDON:

WEST, NEWMAN AND CO., PRINTERS,
HATTON GARDEN, E.C.



CONTENTS.

ALPHABETICAL LIST OF CONTRIBUTORS.

- ANDERSON, Mrs.**
Reported occurrence of the Black Woodpecker in the New Forest, 395
- ANDREWS, JAMES**
Baillon's Crake in Dorsetshire, 396
- APLIN, O. V., M.B.O.U.**
Petrels seen on the voyage to Montevideo, 152; Ornithological notes from Oxfordshire, 340
- ARMISTEAD, J. J.**
Swimming cats, 353; Food of the Squirrel, 354; Black Guillemot on the Solway Firth, 395
- BARRETT-HAMILTON, G. E. H.**
Waxwing in Cambridgeshire, 109; Marten in Lincolnshire, 354
- BARRINGTON, R. M., LL.D., F.L.S.**
Antarctic Sheathbill on the coast of Ireland, 28
- BARRINGTON, EDWARD C.**
Stock Dove in Co. Wicklow, 192; Hairy-armed Bat in Co. Dublin, 426
- BELFRAGE, J. H.**
Greater Spotted Woodpecker killing a young Pheasant, 310
- BENGOUGH, A. J.**
Lesser Redpoll nesting in Dorsetshire, 396
- BENNETT, E.**
Goldfinches breeding in captivity, 431
- BENSON, Rev. CHAS. W.**
Ornithological notes from the Lake of Lucerne, 432
- BLAGG, E. W. H.**
Waxwing in Staffordshire, 109
- BOLAM, GEORGE, F.Z.S.**
Lesser Whitethroat in the North of England, 106
- BORRER, WILLIAM, M.A., F.L.S.**
The Serotine Bat in Sussex, 223
- BOULENGER, G. A., F.Z.S.**
Rana agilis in the Channel Islands, 355
- BRADSHAW, G. W.**
Otter in Sussex, 102; Willow Wren in winter, 109; Ruff in Sussex, 109; Garganey in Sussex, 226, 269; Variation in the colour of Field Voles, 302; Long-tailed Duck in Sussex, 460
- BRAZENER BROS.**
Waxwing and Firecrest in Sussex, 149
- BURR, M.**
Black Rats, 71
- BUTLER, A. G., F.L.S.**
Experiences in breeding Parson Finches, 20; Hybrid birds at the Crystal Palace Show, 190; Bulbul feeding Blue-birds in captivity, 227
- BUTLER, Col. E.**
Crane in Suffolk, 313
- BUTTRESS, LEONARD**
Baillon's Crake in Notts, 73
- CAMBRIDGE, Rev. O. P., M.A., F.Z.S.**
Blackbird marked like Ring Ouzel, 189
- CARTER, JAMES**
Dimensions of the Adder, 397
- CHAPMAN, ALFRED C.**
Lesser Whitethroat in Co. Durham, 74
- CHARLTON, G. V.**
Dimensions of the Adder, 397
- CHRISTY, MILLER, F.L.S.**
A catalogue of local lists of British Mammals, Reptiles, and Fishes, arranged under counties, 174,

- 209, 241; A scheme for mapping the geographical distribution of vertebrate animals, 401
- CLARK, S. V.
Quail nesting in Sussex, 268
- COBURN, F.
Woodchat in Worcestershire, 458;
Female Merganser assuming male plumage, 458
- CORBIN, G. B.
Birds of prey in the New Forest, 428; Coot on the Hampshire Avon, 430; Short-eared Owl in Hampshire in summer, 435
- CORDEAUX, JOHN
Notes from Heligoland, 25; Proportion of adult and immature birds amongst accidental visitors to the British Isles, 26, 73; Garganey in Holderness, 105; Zonotrichia albicollis in Holderness, 149; Nutcracker in Lincolnshire, 191; Ring Ouzel in winter, 192; Black Redstart at Flamborough Head, 224; Lapland Bunting in Yorkshire, 225; Scandinavian Rock Pipit on the east coast of England, 227; Food of the Squirrel, 301; Common Sandpiper nesting in the Eastern Counties, 304; Green Sandpiper in Lincolnshire in June, 304
- COWARD, T. A.
Lesser Whitethroat breeding in Carnarvonshire, 395
- DAVIES, S. A.
Ornithological notes from Mid-Hants for 1892, 8; Nesting of the Coot, 191
- DOBBIE, J. B.
The Tropic-bird, 225
- DOBBIE, W. HENRY
Black Tern in Cheshire, 227
- ELLIOTT, A. C.
Avocet in Notts, 355
- ELLIOTT, J. STEELE
Curlew Sandpiper in Co. Donegal, 305; Quail in Worcestershire, 306; Hobby in Worcestershire, 312; Daubenton's Bat in Bedfordshire, 354; Black Tern in Warwickshire, 395
- ELLIS, W. B.
Serotine in Sussex, 458
- ETCHES, A. H.
Wagtail's nest in November, 30;
Tufted Duck breeding in Warwickshire, 429
- EVANS, C. I.
Black Tern in Yorkshire, 308
- EVANS, H. A.
The "Russet-pated Chough" of Shakespeare, 409
- EVANS, WILLIAM
Black Rats, 71
- FARREN, WM.
Singular accident to a Greenfinch, 25
- FEILDEN, Col. H. W., C.M.Z.S.
Animal life in East Greenland, 42;
Salmon and Trout culture in Natal, 57; Weight of Trout, 76;
Ring Ouzel in Norfolk in winter, 148; Transportation of Coral by the Gulf Stream, 352; Golden Oriole in the Færoe Islands, 355
- FIELDSSEND, A.
Nutcracker in Lincolnshire, 153
- FISHER, Major C. HAWKINS
The "Russet-pated Chough," 427
- FOWLER, W. WARDE, M.A.
Marsh Warbler in Oxfordshire, 303
- GARNETT, CHARLES
Old English Black Rat at Bristol, 19
- GATKE, H.
Bird migration at Heligoland, 164
- GOLDSMITH, H. ST. B.
Red-throated Diver and Spotted Crake in Somersetshire, 22;
Snowy Owl on Exmoor, 226;
Nesting of the Quail in Somersetshire, 305
- GORDON, C. S.
Black Rat in Portugal, 146
- GORDON, Rev. Preb. H. D., M.A.
Hoopoe in Sussex, 228; Gilbert White and his Sussex connexions, 295, 441
- GOULD, F. H. CARRUTHERS
Nesting of the Short-eared Owl in N. Devon, 231
- GURNEY, J. H., F.L.S., F.Z.S.
Peahen assuming male plumage, 23; Former abundance of the Kite in London, 106; Reported occurrence of the Two-barred Crossbill and Scarlet Grosbeak in Norfolk, 150; Ruddy Sheldrake in Norfolk, 152; Purple Gallinules in Norfolk and Suffolk, 192; Food of the Eider, 458
- HAIGH, G. H. CATON
Bottle-nosed Whale on Lincolnshire coast, 20

- HAMMOND, W. OXENDEN
Little Gull in Kent, 103
- HART, H. CHICHESTER, B.A., F.L.S.
Additional notes on the Birds of Donegal, 22; Wood Wren and Blackcap in Co. Wicklow, 225; Sabine's Gull in Co. Donegal, 459
- HARTING, J. E., F.L.S., F.Z.S.
Memoir of the late Sir Richard Owen, K.C.B., F.R.S., 14; The late Professor J. O. Westwood, 99; Mortality amongst Rabbits in Tasmania, 102; Plague of Field Voles in Scotland, 121; Observations on the Common Field Vole of Thessaly, 139; The Ornithology of Tennyson, 145; Waxwing in Caithness, 148; Antarctic Sheathbill on the coast of Ireland, 151; Nesting of the Black Scoter in Sussex, 151; The British Marten, 161; Proposed Amendment of the Wild Birds' Protection Act, 172; Aristotle on plagues of Field Mice, 187; Nesting of the Coot, 191; Purple Gallinule in Norfolk and Sussex, 192; Centenary Anniversary of Gilbert White, 201, 264, 290; The Audubon Monument in New York City, 217; Origin of the name "Dor-beetle," 313; The Great Barrier Reef of Australia, 321; The "Russet-pated Chough" of Shakespeare, 332, 393; The Vole plague in Scotland, 353; Memoir of the Rev. Leonard Blomefield, M.A., 413; Whiskered Bat in Scotland, 426; European Beavers at the Zoological Gardens, 457
- HATCH, P. L.
Wax-like Tips in the feathers of *Ampelis*, 250
- HEWITT, H. C.
Barn Owl breeding in confinement, 23; Sheldrake in captivity, 24
- HOWSE, RICHARD
Macqueen's Bustard on the Yorkshire coast, 21
- HUBERT, A. B.
Black variety of the Brown Rat, 103
- IRBY, Lieut.-Col. L. H.
Occurrence of the Carrion Crow in the Island of Coll, 73
- JAMESON, H. LYSTER
Addition to the birds of Donegal, 75
- KELSALL, Rev. J. E.
Polecat in Cheshire, 102
- KERMODE, P. M. C.
Contributions to the Vertebrate Fauna of the Isle of Man, 61
- KERRY, F.
Iceland Gull at Harwich, 108; Waxwings near Harwich, 109; Waxwings in Essex, 149
- KNIGHT, F. A.
Fork-tailed Petrel in Somersetshire, 22
- LAVER, HENRY, F.L.S.
Bullfinches and lilac seeds, 29
- LILFORD, Rt. Hon. Lord, F.L.S.
Notes on the Ornithology of Northamptonshire and Neighbourhood for 1892, 89; Purple Gallinules in Norfolk and Sussex, 147
- LODGE, G. E.
Dimensions of the Adder, 397
- LOWE, JOHN, M.D., F.L.S.
On a newly-observed habit in the Blackcap Warbler, 169, 269
- MACPHERSON, A. HOLTE, M.A., F.L.S.
Hybrid Finches at the Crystal Palace, 103; Hybrid Birds at the Crystal Palace Show, 154; Aristotle on plagues of Field Mice, 187
- MACPHERSON, Rev. H. A., M.A.
Ptarmigan in Lakeland, 97; Rare birds in Lancashire, 150; Gadwall in Scotland, 153; Hybrid Grey Geese, 190; Sabine's Gull in Cumberland, 429; Tunny in the Solway Firth, 435
- MARSDEN, H. W.
Albino Squirrel, 426, 457
- MATHEW, Rev. MURRAY A., M.A.
Zoological Maps, 457; The Birds of Pembrokeshire, 460
- MEADE-WALDO, E. J. B.
Purple Gallinules in Norfolk and Sussex, 147
- MEINERTZHAGEN, R.
Black Stork in Middlesex, 396
- NELSON, T. H.
Ornithological notes from Redcar, 3; Sabine's Gull on N.W. coast of England, 459
- NEWTON, Prof., M.A., F.R.S.
The "Russet-pated Chough" of Shakespeare, 390
- O'CANNON, MATT. WELD
Partridges migrating, 433

- OLDHAM, CHARLES**
Daubenton's Bat in Cheshire, 103;
Rossia Oweni on the Anglesea
coast, 436; Natterer's Bat in
S. Lancashire, 457; Black Tern
in S. Lancashire, 458
- PARKIN, THOMAS, M.A., F.Z.S.**
Garganey near Hastings, 193
- PATTERSON, ROBERT**
Night Heron near Belfast, 459
- PHILLIPS, E. CAMBRIDGE, F.L.S.**
Preservation of the Kite in
Wales, 355; The "Russet-pated
Chough" of Shakespeare, 427
- PIDSLEY, WM. E. HELMAN**
Sheldrake and other birds at Ex-
mouth, 267
- PIGOTT, T. DIGBY, C.B.**
The Cormorants in St. James's
Park, 434
- PILING, FRANK**
Ornithological notes from Redcar
for 1891-2, 3
- PLAYNE, H. C.**
Ornithological notes from the Alps,
308
- POPHAM, H. LEYBORNE**
Lesser Fork-beard in Plymouth
Sound, 436
- PRATT & SONS**
Bittern in Sussex, 108; Lapland
Buntings, Bernicle, and Spoon-
bill, 108
- QUELCH, J. J.**
The Deer of British Guiana, 19;
Venom in harmless Snakes, 30
- QUINTIN, W. H. ST.**
Animals poisoned by yew, 146
- READ, ROBERT H.**
Nesting of the Grey Wagtail and
Dipper in Surrey, 307
- REID, CLEMENT, F.L.S., F.G.S.**
Lapwings passing over London,
153
- RICKARDS, Rev. MARCUS S. C., M.A.**
Richard's Pipit in Somersetshire,
267
- RIVERS, H. SOMERS**
Suggested occurrence of *Loxia leu-
coptera* in Herts, 27
- ROBINS, A. F.**
Protection of Kangaroos, 301
- ROPE, G. T.**
Notes on some land shells collected
at Much Hadham, Herts, 1
- SALMON, ERNEST S.**
Great Grey Shrike in Surrey,
22
- SALTER, J. H.**
Polecat near Aberystwith, 102;
Notes from Aberystwith, 104;
Breeding of the Dunlin in
Wales, 269; Preservation of the
Kite in Wales, 311
- SAUNDERS, HOWARD, F.L.S., F.Z.S.**
Distribution of *Sylvia curruca*, 74
- SEEBOHM, HENRY, F.L.S., F.Z.S.**
Proportion of adult and immature
birds amongst accidental visitors
to the British Isles, 71; Plumage
of White's Thrush, 267
- SERVICE, ROBERT**
Spotted Crake in Scotland, 24;
Ring Ouzel in Scotland in winter,
27; Little Grebe killed by tele-
graph-wires, 29; Distribution of
the Alpine Hare in S.W. Scot-
land, 265; Variation in the colour
of Field Voles, 266; Green Sand-
piper in S.W. Scotland, 305;
Quail in S.W. Scotland, 306;
Hare with one ear, 425; White
Moles, 425; Decadence of the
Vole plague in Scotland, 426;
Bonito in the River Dee, 436;
Adders useful in destroying
Voles, 460
- SHUFELDT, Dr. R. W.**
Crystalline lens in Vertebrates,
224; Notes on the American
Bittern, 228
- SLADE, W. D.**
Bittern in Dorset, 29
- SLATER, Rev. H. H., M.A., F.Z.S.**
Garganey in Holderness, 73; *Sirex
gigas* and *Colias edusa* in Hol-
derness, 76; Lesser Whitethroat
in Co. Durham, 107
- SMITH, Rev. ALFRED CHARLES, M.A.**
Bitterns in Wilts, 24
- SOUTHWELL, T., F.Z.S.**
Occurrence of Sowerby's Whale on
the Norfolk coast, 41; Notes on
the Seal and Whale Fishery,
1892, 81; Swimming Cats, 302
- STARES, JOHN**
Quail in winter in S. Hants, 30;
Spoonbill in S. Hants, 268
- STOTT, C. E.**
Water Shrew in S.W. Lancashire,
302
- SUCHETET, A.**
Hybridity, 304
- SWAINSON, Capt. E. A.**
Grasshopper Warbler near Brecon,
269; On the distribution and

- habits of the Pied Flycatcher in Wales, 420
- SWAINSON, F. E.
Montagu's Harrier nesting in Cambridgeshire, 312
- TERRY, HORACE
Early nesting of the Greater Spotted Woodpecker, 269
- THOMASSON, JOHN P.
Fertility of the Meadow Pipit in Norway, 312
- THORPE, D. LORT
Notes on the birds of North-western Canada, 44; Cormorant with parasitic worms, 75
- TREVOR-BATTYE, AUBYN
Mongrel Ducks in the London Parks, 229
- TRISTRAM, Rev. H. B., LL.D., F.R.S.
Differentiation, Migration, and Mimicry, 361
- TUCK, Rev. JULIAN G., M.A.
Velvet Scoter in W. Suffolk, 23; Peahen assuming male plumage, 23; Waxwings in Suffolk, 148; Purple Gallinule in Suffolk, 428
- WARREN, ROBERT
Hump-backed Whale on the coast of Sligo, 188; White Wagtail in Co. Mayo, 226; Basking Shark on coast of Sligo, 270
- WEBB, WILFRED MARK, F.L.S.
On the manner of feeding in *Testacella scutulum*, 281, 356
- WHITAKER, J., F.Z.S.
Purple Gallinule in Norfolk, 105; Purple Gallinule in Sussex, 105; Little Gull in Notts, 108; Bewick's Swan at Annesley, 108; Black-tailed Godwit in Nottinghamshire, 109; Hen Harrier at Rainworth, 109; Variety of Woodcock, 109; Curious nesting-place of Pied Wagtail, 458; Nesting of Spotted Flycatcher, 459; Baillon's Crake near Nottingham, 491
- WHITLOCK, F. B.
Mice and apricots, 354; Ornithological notes from Leicestershire, 450
- WILKINSON, W. M.
Red-necked Phalarope in Anglesea, 428
- WILLIAMS, EDWARD
Ferruginous Duck in Ireland, 106; Serin in Ireland, 108; Waxwing in Co. Wicklow, 109; American Red-breasted Snipe in Ireland, 433; Solitary Snipe in Co. Mayo, 434
- WITHERBY, H. F.
Thrush's nest without mud lining, 225

ALPHABETICAL LIST OF SUBJECTS.

- Adder, dimensions of, 397; useful in destroying Moles, 460
- Albino Squirrel, 426, 457
- Alps, ornithological notes from the, 308
- Ampelis, wax-like tips in feathers of, 230
- Animals, wild, destruction of, in India, 394; Vertebrate, scheme for mapping the geographical distribution of, 401
- Aristotle on plagues of Field Mice, 187
- Audubon Monument in New York city, 217
- Australia, protection of Kangaroos in, 301; Great Barrier Reef of, 321
- Avocet in Notts, 355
- Bat, Daubenton's, in Cheshire, 103,—in Bedfordshire, 354; Great, in Sussex, 458; Hairy-armed in Co. Dublin, 426; Natterer's, in S. Lancashire, 457; Serotine, in Sussex, 223, 458; Whiskered, in Scotland, 426
- Beavers, European, at the Zoological Gardens, 457
- Bedfordshire*.—Local lists of mammals, reptiles, and fishes, 176, 241, 252; Daubenton's Bat, 354
- Birds of Donegal, additional notes on, 22, 75; adult and immature, proportion of, amongst accidental visitors to the British Islands, 26, 71, 73; of North-Western Canada, 48; of prey, in the New Forest, 428; of Pembrokeshire, 460
- Bittern in Wilts, 24,—in Dorset, 29,—in Sussex, 108; American, notes on, 228
- Blackbird marked like Ring Ouzel, 189
- Blomefield, Rev. Leonard, memoir of, 394, 413
- Blue-birds, Bulbul feeding, in captivity, 227
- Bonito in river Dee, 436
- BOOKS REVIEWED:—
- Text-Book of the Embryology of Man and Mammals, by Dr. Oscar Hertwig, 37
- The Life of a Foxhound, by John Mills, 39
- Delagoa Bay, its Natives and Natural History, by Rose Monteiro, 39
- Sporting Sketches in S. America, by Admiral Kennedy, 114
- Phases of Animal Life, Past and Present, by R. Lyddeker, 116
- The Birds of Lancashire, by F. S. Mitchell, 2nd edition, revised and annotated by Howard Saunders, 117
- Manipulations de Zoologie, Animaux Vertébrés, par le Dr. Paul Girod, 119
- A Descriptive List of the Deer Parks and Paddocks of England, by Joseph Whitaker, 197
- Horn Measurements and Weights of the Great Game of the World, being a Record for the use of Sportsmen and Naturalists, by Rowland Ward, 199
- Animal Coloration, an Account of the principal Facts and Theories relating to the Colours and Markings of Animals, by F. E. Beddard, 235
- Idle Days in Patagonia, by W. H. Hudson, 236
- Short Stalks, or Hunting Camps, North, South, East, and West, by Edward North Buxton, 238
- Eléments d'Anatomie Comparée, par Rémy Perrier, 275
- L'Evolution et l'Origine des Espèces, par T. H. Huxley, 277
- L'Amateur d'Oiseaux de Volière, Espèces indigènes et exotiques, par Henri Moreau, 278
- La Pêche et les Poissons des Eaux douces, par Arnould Locard, 280
- Castorologia, or the History and Traditions of the Canadian Beaver, by Horace T. Martin, 314
- Wild Spain, Records of Sport with Rifle, Rod, and Gun, Natural History and Exploration, by Abel Chapman and Walter J. Buck, 317
- The Great Barrier Reef of Australia, by W. Saville Kent, , 321

- Fur-bearing Animals in Nature and Commerce, by Henry Poland, 356, 397
- The Amphioxus and its Development, by Dr. B. Hatschek, 398
- The Great Sea Serpent, an Historical and Critical Treatise, by A. C. Oudemans, 399
- Zoology of the Invertebrata, a Text-book for Students, by A. E. Shipley, 440
- A Dictionary of Birds, by Alfred Newton, assisted by Hans Gadow, 465
- Breeding of Stone Curlew in Hants, 11; of Crossbill in Hants, 12; of Wood Pigeon in Hants in October, 12; of Parson Finch, 20; of Shoveller in Donegal, 22; of Barn Owl in confinement, 23; of Dunlin in Wales, 269; of Lesser Whitethroat in Carnarvonshire, 395; of Fulmar in Shetland, 429; of Tufted Duck in Warwickshire, 429; of Goldfinch in captivity, 431
- British Association Reports, 386
- Bulbul feeding Blue-birds in captivity, 227
- Bullfinches and lilac-seeds, 29
- Bunting, Lapland, at Brighton, 108,—in Yorkshire, 225
- Bustard, Macqueen's, on Yorkshire coast, 21
- Buzzard, Common, nesting in Hants, 11; Rough-legged, in Hants, 8, 9
- Cambridgeshire*.—Barn Owl breeding in confinement, 23; Sheldrake in captivity, 24; accident to a Greenfinch, 25; Waxwing, 109; local lists of mammals, reptiles, and fishes, 176, 241, 252; Montagu's Harrier, 312
- Canada, birds of N. Western, 44; American Bittern in, 228
- Catalogue of local lists of British mammals, reptiles, and fishes, arranged under counties, 174, 209, 241
- Cats swimming, 302, 353
- Cephalopoda, luminous organs in, 387
- Channel Islands, *Rana agilis* in, 355
- Cheshire*.—Polecat, 102; Daubenton's Bat, 103; local lists of mammals, reptiles, and fishes, 177, 242, 252; Black Tern, 227
- Chough, "Russet-pated," of Shakespeare, 332, 390, 393, 409, 427
- Colias edusa* in Holderness, 76
- Colour, variation of, in Field Voles, 266, 302
- Coot, nesting of, 191; on Hampshire Avon, 430
- Coral, transportation of, by Gulf Stream, 352
- Cormorant with parasitic worms, 75; in St. James's Park, 434
- Cornwall*.—Local lists of mammals, reptiles, and fishes, 177, 242, 252
- Crake, Baillon's, in Notts, 73, 459; in Dorsetshire, 396; Spotted, in Yorkshire, 6,—in Hants, 12,—in Somersetshire, 22,—in Scotland, 24
- Crane in Suffolk, 313
- Crossbill breeding in Hants, 12; American White-winged, in Herts, 27; Two-barred, in Norfolk, 150
- Crow, Carrion, in Island of Coll, 73
- Cumberland*.—Ptarmigan, 97; local lists of mammals, reptiles, and fishes, 177, 242, 253; hybrid Grey Geese, 190; Sabine's Gull, 429
- Curlew, Stone, breeding in Hants, 11,—in Hants, 12
- Deer of British Guiana, 19; Deer Forests Commission, 147
- Derbyshire*.—Local lists of mammals, reptiles, and fishes, 177, 242, 253
- Devonshire*.—Local lists of mammals, reptiles, and fishes, 178, 243, 253; Snowy Owl, 226; Short-eared Owl, 231; Sheldrake and other birds, 267; Lesser Fork-beard, 436
- 'Dictionary of Birds,' Prof. Newton's, 222, 465
- Differentiation, migration, and mimicry, 361
- Dipper in Hants, 13,—nesting in Surrey, 307
- Distribution, geographical, of animals, scheme for mapping, 401
- Diver, Red-throated, in Somersetshire, 22; Black-throated, in Donegal, 23
- "Dor-beetle," origin of name, 313
- Dorsetshire*.—Bittern, 29; local lists of mammals, reptiles, and fishes, 179, 243, 254; Blackbird, 189; Lesser Redpoll, 396; Baillon's Crake, 396
- Dove, Stock, early nesting of, in Hants, 9; in Co. Wicklow, 192

- Duck, Eider, in Yorkshire, 6,—food of, 458; Ferruginous, in Ireland; Long-tailed, in Sussex, 460; Tufted, breeding in Hants, 11,—breeding in Warwickshire, 429
- Ducks, mongrel, in London Parks, 229
- Dunlin breeding in Wales, 269
- Durham*.—Lesser Whitethroat, 74, 106, 107; local lists of mammals, reptiles, and fishes, 179, 243, 254
- Eggs, wild birds', protection of, 389
- Essex*.—Bullfinches and lilac-seeds, 29; Iceland Gull, 108; Waxwing, 109, 149; local lists of mammals, reptiles, and fishes, 179, 243, 254
- Euthemisto compressa* in Yorkshire, 7
- Færoe Islands, Golden Oriole in, 355
- Fauna, Vertebrate, of Isle of Man, 61
- Finch, Banded Grass, 21; Parson, breeding, 20; Serin, in Ireland, 108
- Firecrest in Sussex, 149
- Fishery, Seal and Whale, of 1892, 81
- Fishes, British, catalogue of local lists of, 252; of Isle of Man, 65
- Flycatcher, Pied, distribution and habits of, in Wales, 420; Spotted, nesting in Notts, 459
- Fork-beard, Lesser, in Plymouth Sound, 436
- Fulmar breeding in Shetland, 429
- Gadwall in Donegal, 22,—in Scotland, 153
- Gallinule, Purple, in Norfolk, 105, 147, 192,—in Sussex, 105, 147, 192,—in Suffolk, 428
- Garganey in Holderness, 73, 105,—near Hastings, 193,—in Sussex, 226, 269
- Gloucestershire*.—Local lists of mammals, reptiles, and fishes, 180, 244, 254; Greater Spotted Woodpecker, 310; Albino Squirrel, 426, 457
- Godwit, Black-tailed, in Notts, 109
- Goldfinch breeding in captivity, 431
- Goose, Bernicle, at Brighton, 108; Grey, hybrid, 190
- Grebe, Little, on railway-platform, 5,—killed by telegraph-wires, 29; Red-necked, in Yorkshire, 3, 6; Slavonian, in Donegal, 23
- Greenfinch, accident to a, 25
- Greenland, East, animal life in, 42
- Grosbeak, Scarlet, in Norfolk, 150
- Grouse, Red and Black, hybrid, 32, 463
- Guiana, British, Deer of, 19; venom in harmless Snakes, 30; Coral Snake, 30; Mattipi Snake, 31
- Guillemot, Black, in Solway Firth, 395
- Gulf Stream, transportation of coral by, 352
- Gull, Glaucous, in Yorkshire, 7; Iceland, at Harwich, 108; Little, in Kent, 108,—in Notts, 108; Sabine's, in Cumberland, 429,—on N.W. coast of England, 459
- Habit, newly observed, in Blackcap Warbler, 169, 269
- Habits and distribution of Pied Flycatcher in Wales, 420
- Hampshire*.—Ornithological notes, 8; Quail, 30; local lists of mammals, reptiles, and fishes, 180, 185, 244, 248, 254, 259; Coot, 191, 430; Spoonbill, 268; Black Woodpecker, 395; birds of prey, 428; Short-eared Owl, 435
- Hare, Alpine, distribution in S.W. Scotland, 265; with one ear, 425
- Harrier, Hen, in Hants, 10,—in Notts, 109; Montagu's, nesting in Cambridgeshire, 312
- Heligoland, ornithological notes from, 25
- Helix pomatia in Herts, 1
- Herefordshire*.—Local lists of mammals, reptiles, and fishes, 180, 244, 255
- Heron, Night, near Belfast, 459
- Hertfordshire*.—Land shells, 1; Helix pomatia, 1; American White-winged Crossbill, 27; Great Grey Shrike, 27
- Hobby nesting in Hants, 10; in Worcestershire, 312
- Hoopoe in Sussex, 228
- Huntingdonshire*.—Local lists of mammals, reptiles, and fishes, 180, 244, 255
- Hybrid Red and Black Grouse, 32, 463; birds at Crystal Palace Show, 103, 154, 190; Grey Goose, 190
- Hybridity, 32, 304, 463
- India, destruction of wild animals in, 394
- Ireland*.—Birds of Donegal, 22, 75; Antarctic Sheathbill, 28, 151; South Pacific Petrel, 29; Ferruginous Duck, 106; Serin, 108; Waxwing,

- 109; local lists of mammals, reptiles, and fishes, 215, 251, 262; Hump-backed Whale, 188; Stock Dove, 192; Wood Wren, 225; Blackcap, 225; White Wagtail, 226; Basking Shark, 270; Curlew Sandpiper, 305; Hairy-armed Bat, 426; Partridge, 433; American Red-breasted Snipe, 433; Solitary Snipe, 434; Merganser, 458; Night Heron, 459; Sabine's Snipe, 459
- Kangaroos, protection of, in Australia, 301
- Kent*.—Breeding Parson Finches, 20; Banded Grass Finch, 21; hybrid birds, 103, 154, 190; Little Gull, 108; local lists of mammals, reptiles, and fishes, 180, 244, 255; Thrush's nest without mud lining, 225
- Kite, former abundance in London, 106,—preservation, in Wales, 311, 355
- Lakeland, Ptarmigan in, 97
- Lancashire*.—Rare birds, 150; local lists of mammals, reptiles, and fishes, 180, 244, 255; Water Shrew, 302; Natterer's Bat, 457; Black Tern, 458; Sabine's Gull, 459
- Lapwings passing over London, 153
- Lark, Shore, in Yorkshire, 4
- Leicestershire*.—Local lists of mammals, reptiles, and fishes, 181, 245, 255; ornithological notes, 450
- Lens, crystalline, in vertebrates, 224
- Life, animal, in East Greenland, 42
- Lincolnshire*.—Bottle-nosed Whale, 20; local lists of mammals, reptiles, and fishes, 181, 245, 255; Nutcracker, 153, 191; Scandinavian Rock Pipit, 227; Common Sandpiper, 304; Green Sandpiper, 304; Marten, 354
- Loxia leucoptera* in Herts, 27
- Magazines, Scientific, notes on, 79
- Mammals, British, catalogue of local lists of, 174, 209; of Isle of Man, 62
- Man, Isle of, vertebrate fauna, 61; local lists of mammals, reptiles, and fishes, 181, 245, 255
- Maps, zoological, 401, 457
- Marine biological investigations, 386; zoology of Irish Sea, 387
- Marten, British, in Wales, 161,—in Lincolnshire, 354
- Mauritius, Tropic-bird of, 225
- Merganser, female, assuming male plumage, 458
- Mice, Field, Aristotle on plagues of, 187; and apricots, 354
- Middlesex*.—Kite, 106; Lapwing, 153; mongrel Ducks, 229; Black Stork, 396; Cormorant, 434; Beavers at Zoological Gardens, 457
- Migration of birds, 371; at Heligoland, 164; of Partridge, 433
- Mimicry, 379
- Moles, white, 425
- Natal, Salmon and Trout culture in, 57
- Nest, Thrush's, without mud lining, 225; of Pied Wagtail, 458
- Nesting of Redshank in Yorkshire, 4; early, of Stock Dove in Hants, 9; of Hobby in Hants, 10; of Common Buzzard in Hants, 11; of Quail in Hants, 11,—in Sussex, 268,—in Somersetshire, 305; of Wagtail in Warwickshire in Nov., 30; of Black Scoter in Sussex, 151; of Coot in Hants, 191; of Short-eared Owl in Devon, 231; early, of Greater Spotted Woodpecker, 269; of Common Sandpiper in Eastern Counties, 304; of Grey Wagtail in Surrey, 307; of Dipper in Surrey, 307; of Montagu's Harrier in Cambridgeshire, 312; of Lesser Redpoll in Dorsetshire, 396; of Pied Wagtail in Notts, 458; of Spotted Flycatcher in Notts, 459
- New Zealand, native birds, preservation of, 154
- Norfolk*.—Peahen assuming male plumage, 23; Sowerby's Whale, 41; weight of Trout, 76; Purple Gallinule, 105, 147, 192; Ring Ouzel, 148; Two-barred Crossbill, 150; Scarlet Grosbeak, 150; Ruddy Sheldrake, 152; local lists of mammals, reptiles, and fishes, 181, 245, 256; swimming Cats, 302; Eider Duck, 458
- Northamptonshire*.—Ornithological notes, 89; local lists of mammals, reptiles, and fishes, 182, 246, 256
- Northumberland*.—Lesser White-throat, 106; local lists of mammals, reptiles, and fishes, 182, 246, 256; protection of sea-birds, 222
- Norway, Meadow Pipit in, 312
- Notes, ornithological, from Redear for 1891-2, 3,—from Mid-Hants for

- 1892, 8,—from Donegal, 22,—from Heligoland, 25,—from N.W. Canada, 44,—from Northampton and neighbourhood for 1892, 89,—from Aberystwith, 104,—from the Alps, 308,—from Oxfordshire, 340,—from Lake of Lucerne, 432,—from Leicestershire, 450; on scientific magazines, 79
- Nottinghamshire*.—Baillon's Crane, 73, 459; Little Gull, 108; Bewick's Swan, 108; Black-tailed Godwit, 109; Hen Harrier, 109; Squirrel, 301; Mice and apricots, 354; Avocet, 355; Pied Wagtail, 458; Spotted Flycatcher, 459
- Nutcracker in Lincolnshire, 153, 191
- Oriole, Golden, in Færoe Islands, 355
- Ornithological Notes (see Notes)
- Ornithology of Tennyson, 145
- Otter in Sussex, 102
- Ouzel, Ring, in Scotland in winter, 27,—in Norfolk, &c., in winter, 148,—in Yorkshire in winter, 192
- Owen, Sir Richard, memoir of, 14
- Owl, Barn, breeding in confinement, 23; Short-eared, nesting in N. Devon, 231,—in Hampshire in summer, 435; Snowy, on Exmoor, 226
- Oxfordshire*.—Local lists of mammals, reptiles, and fishes, 183, 246, 257; Marsh Warbler, 303; ornithological notes, 340
- Partridges migrating, 433
- Pascoe, F. P., memoir of, 320
- Peahen assuming male plumage, 23
- Petrel, Fork-tailed, in Yorkshire, 5,—in Somersetshire, 22; Fulmar, in Yorkshire, 4; South Pacific, 29
- Petrels seen on voyage to Montevideo, 152
- Phalarope, Red-necked, in Yorkshire, 5,—in Anglesea, 428
- Pigeon, Wood, breeding in Hants in October, 12
- Pipit, Meadow, fertility of, in Norway, 312; Richard's, in Somersetshire, 267; Scandinavian Rock, on east coast of England, 227
- Plague of Field Voles in Scotland, 121, 187, 426; in Thessaly, 139, 187
- Plumage, male, assumed by Peahen, 23,—by female Merganser, 458; of White's Thrush, 267
- Polecat near Aberystwith, 102,—in Cheshire, 102
- Portugal, Black Rat in, 146
- Protection of Sea-birds on the Farne Islands, 222; of wild birds' eggs, 389
- Ptarmigan in Lakeland, 97
- Quail nesting in Hants, 11,—in Hants in winter, 30,—nesting in Sussex, 268,—nesting in Somersetshire, 305,—in Worcestershire, 306,—in S.W. Scotland, 306
- Rabbits, mortality amongst, in Tasmania, 102
- Rana agilis* in Channel Islands, 355
- Rat, Black, at Bristol, 19, 71,—in Portugal, 146; Brown, black variety of, 103
- Redpoll, Lesser, nesting in Dorsetshire, 396
- Rødshank, nesting in Yorkshire, 4
- Redstart, Black, at Flamborough Head, 224
- Reef, Great Barrier, of Australia, 321
- Reid, W., of Wick, death of, 264
- Reptiles, British, catalogue of local lists of, 241; of Isle of Man, 64
- Rossia Oweni on Anglesea coast, 436
- Ruff in Sussex, 109
- Rutlandshire*.—Local lists of mammals, reptiles, and fishes, 183, 246, 257
- Salmon and Trout culture in Natal, 57
- Sandpiper, Common, nesting in Eastern Counties, 304; Curlew, in Co. Donegal, 305; Green, in Lincolnshire in June, 304,—in S.W. Scotland, 305; Purple, in Yorkshire, 6
- Scoter, Black, nesting in Sussex, 151; Velvet, in Yorkshire, 5,—in Suffolk, 23
- Scotland*.—Spotted Crane, 24; Ring Ouzel, 27; Little Grebe, 29; Black Rat, 71; Carrion Crow, 73; Woodcock, 109; Field Voles, 121, 266, 353, 426,—destroyed by Adders, 460; Waxwing, 148; Gadwall, 153; local lists of mammals, reptiles, and fishes, 209, 249, 260; Alpine Hare, 265; Green Sandpiper, 305; Quail, 306; swimming Cats, 353; Squirrel, 354; Hare with one ear, 425; White Moles, 425; Whiskered Bat, 426; Fulmar, 429; Bonito, 430

- Sea-birds, protection of, on Farne Islands, 222
- Seal and Whale fishery of 1892, notes on, 81
- Seals and Whales, 388
- Shark, Basking, on coast of Sligo, 270
- Sheathbell, Antarctic, on coast of Ireland, 28, 151
- Sheldrake in captivity, 24, — and other birds, at Exmouth, 267; Ruddy, in Norfolk, 152
- Shells, land, at Much Hadham, Herts, 1
- Shoveller breeding in Co. Donegal, 22
- Shrew, Water, in S.W. Lancashire, 302
- Shrike, Great Grey, at sea, 6, — in Surrey, 22, — in Herts, 27
- Shropshire*. — Local lists of mammals, reptiles, and fishes, 183, 246, 257
- Sirex gigas* in Holderness, 76
- Skua, Richardson's, in Yorkshire, 5
- Smew in Co. Donegal, 22
- Snake, Coral, 30; Mattipi, 31
- Snakes, harmless, venom in, 30
- Snipe, American Red-breasted, in Ireland, 433; Sabine's, in Co. Donegal, 459; Solitary, in Co. Mayo, 434
- SOCIETIES, SCIENTIFIC:—
- Linnean, 32, 76, 110, 155, 193, 231, 270, 461
- Zoological, 33, 77, 111, 156, 194, 232, 271, 462
- Entomological, 35, 78, 112, 159, 196, 233, 273, 437, 464
- Solway Firth, Black Guillemot in, 395; Tunny in, 435
- Somersetshire*. — Black Rat, 19; Fork-tailed Petrel, 22; Red-throated Diver, 22; Spotted Crake, 22; local lists of mammals, reptiles, and fishes, 183, 246, 257; Richard's Pipit, 267; Quail, 305; zoological maps, 457
- Spoonbill at Brighton, 108, — in S. Hants, 268
- Squirrel, food of, 301, 354; albino, 426, 457
- Staffordshire*. — Waxwing, 109; local lists of mammals, reptiles, and fishes, 184, 247, 258
- Stainton, H. T., memoir of, 18
- Stork, Black, in Middlesex, 396
- Suffolk*. — Velvet Scoter, 23; Waxwing, 148; local lists of mammals, 184; Crane, 313; Purple Gallinule, 428
- Surrey*. — Great Grey Shrike, 22; black variety of Brown Rat, 103; Greater Spotted Woodpecker, 269
- Grey Wagtail, 307; Dipper, 307
- Sussex*. — Otter, 102; Purple Gallinule, 105, 147, 192; Bittern, 108; Lapland Bunting, Bernicle, and Spoonbill, 108; Willow Wren, 109; Ruff, 109; Waxwing, 149; Firecrest, 149; Black Scoter, 151; local lists of mammals, reptiles, and fishes, 184, 247, 258; Garganey, 193, 226, 269; Gilbert White, 201, 264, 290, 295, 441; Serotine Bat, 223, 458; Hoopoe, 228; Quail, 268; White Field Vole, 302; Great Bat, 458; Long-tailed Duck, 460
- Swan, Bewick's, at Annesley, 108
- Switzerland, ornithological notes from, 308, 432
- Tasmania, mortality amongst Rabbits in, 102
- Teneriffe, newly observed habit in Blackcap Warbler at, 169, 269
- Tennyson, Ornithology of, 145
- Tern, Black, in Cheshire, 227, — in Yorkshire, 308, — in Warwickshire, 395, — in South Lancashire, 458; Lesser, in Hants, 12; Sandwich, in Yorkshire, 4
- Testacella scutulum, manner of feeding in, 281, 356
- Thessaly, Field Vole of, 139, 187
- Thrush, White's, plumage of, 267
- Thrush's nest without mud lining, 225
- Tropic-bird, 225
- Trout, weight of, 76; and Salmon-culture in Natal, 57
- Tunny in Solway Firth, 435
- Variety, black, of Brown Rat, 103; of Woodcock, 109
- Venom in harmless Snakes, 30
- Voles, Field, plague of, in Scotland, 121, 187, 353, — decadence of, 426, — variation of colour in, 266, 302, — Adders useful in destroying, 460; of Thessaly, 139, 187
- Wagtail, nest of, in November, 30; Grey, nesting in Surrey, 307; Pied, curious nesting-place of, in Notts, 458; White, in Co. Mayo, 226
- Wales*. — Hybrid Red and Black

- Grouse, 32; Polecat, 102; ornithological notes, 104; British Marten, 161; local lists of mammals, reptiles, and fishes, 179, 185, 241, 244, 247, 254, 258; Dunlin, 269; Grasshopper Warbler, 269; Kite, 311, 355; Lesser Whitethroat, 395; Pied Flycatcher, 420; Red-necked Phalarope, 428; Rossia Oweni, 436; birds of Pembrokeshire, 460
- Warbler, Blackcap, in Co. Wicklow, 225,—on a newly observed habit in, 169, 269; Grasshopper, near Brecon, 269; Marsh, in Oxfordshire, 303
- Warwickshire*.—Wagtail, 30; local lists of mammals, 185; Black Tern, 395; Tufted Duck, 429
- Waxwing in Staffordshire, 109,—in Cambridgeshire, 109,—near Harwich, 109, 149,—in Co. Wicklow, 109,—in Caithness, 148,—in Suffolk, 148,—in Essex, 149,—in Sussex, 149
- Westmoreland*.—Ptarmigan, 97; local lists of mammals, reptiles, and fishes, 185, 247, 258
- Westwood, Prof. J. O., memoir of, 99
- Whale, Bottle-nosed, on Lincolnshire coast, 20; Hump-backed, on coast of Sligo, 188; Sowerby's, on Norfolk coast, 41; and Seal fishery of 1892, 81
- Whales and Seals, 388
- White, Gilbert, centenary anniversary of, 201, 264, 290; and his Sussex connexions, 295, 441
- Whitethroat, Lesser, in Co. Durham, 74, 107,—in North of England, 106,—breeding in Carnarvonshire, 395
- Wild Birds Protection Act, proposed amendment of, 172, 359; animals, destruction of, in India, 394
- Wiltshire*.—Bittern, 24; local lists of mammals, reptiles, and fishes, 185, 248, 259
- Woodchat in Worcestershire, 458
- Woodcock, variety of, 109
- Woodpecker, Black, in New Forest, 395; Greater Spotted, early nesting of, 269,—killing a young Pheasant, 310
- Worcestershire*.—Local lists of mammals, reptiles, and fishes, 186, 248, 259; Quail, 306; Hobby, 312; Woodchat, 458
- Wren, Willow, in winter, 109; Wood, in Co. Wicklow, 225
- Yew, animals poisoned by, 146
- Yorkshire*.—Ornithological notes, 3; Euthemisto compressa, 7; Macqueen's Bustard, 21; Garganey, 73, 105; Sirex gigas and Colias edusa, 76; animals poisoned by yew, 146; Zonotrichia albicollis, 149; local lists of mammals, reptiles, and fishes, 186, 248, 259; Ring Ouzel, 192; Black Redstart, 224; Lapland Bunting, 225; Scandinavian Rock Pipit, 227; Black Tern, 308
- Zonotrichia albicollis in Holderness, 149
- Zoology, marine, of Irish Sea, 387

ILLUSTRATIONS.

MANNER OF FEEDING IN TESTACELLA SCUTULUM (PLATE I., to face p. 281).

AUDUBON MONUMENT (p. 218).

NATIVE CHIEF OF JERVIS ISLAND, TORRES STRAIT, AND DUGONG KILLED
WITH THE SPEAR (p. 328).



THE ZOOLOGIST.

THIRD SERIES.

VOL. XVII.]

JANUARY, 1893.

[No. 193.

NOTES ON SOME LAND SHELLS COLLECTED AT MUCH HADHAM, HERTS.

BY G. T. ROPE.

THE neighbourhood of Much Hadham, in Hertfordshire, if not already worked out, would, I think, prove an excellent hunting-ground for conchologists. After a good rain, the abundance of land snails to be seen in some spots is truly astonishing, some of the hedge-banks being almost covered with them.

During a month's sojourn there last June, in which I had no time to make anything like a strict search, I noticed the following species:—

Helix pomatia.—Not being aware of the time that this fine species occurred in the immediate neighbourhood, I was much pleased at “meeting” a large and handsome adult crawling on a footpath in a field between Hadham and Standon.

H. aspersa.—Numerous, of good size, and well developed.

H. nemoralis.—Tolerably common, but far less numerous than the next species. One bandless specimen was of a nearly uniform olive-brown tint, inclining to lilac, or pale purple, and becoming a rich tawny colour towards the lip.

H. hortensis.—Remarkably abundant, and showing endless variety both as to ground-colour and banding. One of the most beautiful varieties, of common occurrence here, has a neat compact and rather small shell, of a delicate salmon colour throughout, without bands; some individuals inclining more or less to amber-yellow, others to a bright rosy tint, or again to a

chestnut-red, while some shells, especially when wet, make no very distant approach to scarlet. This variety and the var. *hybrida*—which also occurs here—appear to pass into each other by insensible gradations. The form possessing colourless bands is far from uncommon; some have the bands coloured for a small part of their length.

H. arbustorum.—Numerous in low ground close to the town; of good average size, and both with and without the band.

H. cantiana.—The commonest roadside snail, except after heavy rains, when *H. hortensis* exceeds it in numbers. Many specimens might, I think, be referred to the var. *rubescens*.

H. rufescens.—Common near Much Hadham and Widford.

H. concinna.—Common.

H. hispida.—Noticed several examples on hedge-banks.

H. virgata.—Not observed in the immediate neighbourhood of Hadham, but near the curious old town of Hatfield Broad Oak, a few miles over the Essex border, it was fairly common by the roadside.

H. ericetorum.—Only noticed in one spot—a grassy bank by the side of the road leading from Much Hadham to Bishop's Stortford. It seemed to be fairly numerous, but confined apparently to a very small area.

Cyclostoma elegans.—Occurs on a few steep banks, almost within the town of Much Hadham.

The genus *Zonites* seems to be well represented, being especially abundant at the bottom of the deep dry ditches, thickly overgrown with bushes, which border some of the lanes and by-roads, and form a pleasing feature in the landscape; but of this and various other genera, comprising the smaller snails, such as *Pupa*, *Vertigo*, *Clausilia*, &c., I can say nothing, having had no time to devote to them.

Arion ater can hardly be passed over without notice, as it is here very abundant. Every specimen met with was of an intense black.

Succinea elegans occurs about the margin of ponds in the neighbourhood.

Of water snails, I only saw *Bythinia tentaculata*, *Physa fontinalis*, *Limnæa peregra*, *L. stagnalis*, and *L. truncatula*; but no doubt a careful search would reveal many more species both of land and water shells.

The big double hedges, with a ditch between them, seemed to be much appreciated by the Common Whitethroat, whose scolding note assailed the ear on all sides. On one occasion I was sheltering from a shower in a deep dry ditch or water-course, completely closed in from above by thick hedges on both sides, and, happening to look up, caught sight of the black head and bright eye of a hen Bullfinch within a few feet of my head. She was sitting on a very slightly-built nest in a blackthorn-bush, and I had the satisfaction of effecting a stealthy retreat without disturbing her. So well was the nest concealed from above, that there seemed a good chance of its escaping the prying eyes of the birdsnesting schoolboy.

ORNITHOLOGICAL NOTES FROM REDCAR FOR 1891-92.

BY T. H. NELSON AND FRANK PILLING.

As is usually the case, immediately the close-season commenced in March, immense flocks of Golden Plover congregated on the low lands along the coast line, being brought hither by a strong N.E. gale and snow-storm on the 8th March. Numerous Wood Pigeons appeared at the same time, driven down, no doubt, by the same inclement elements. Snow continued to fall till the 11th, causing a keen competition among the small birds for the scant supply of available food; but by the 13th the fields were again clear of snow. On the 20th, the first Wheatears and Whinchats made their appearance, and there was a northward movement of Pied Wagtails.

On April 1st, a Red-necked Grebe and three Red-throated Divers, in full plumage, were seen disporting themselves near East Scar. Early in this month Cormorants, which desert this district in winter, were observed passing to and fro, between the cliffs south of Huntcliffe and the Tees-mouth, on their matutinal fishing expeditions. On the morning of the 8th a strong easterly gale, with rain, was blowing, and several Woodcocks were on the sand-hills, doubtless awaiting a favourable opportunity for crossing the sea on their return to the breeding haunts in the North of Europe. The easterly winds prevailed right up to the 13th, with unabated force, thereby creating a great increase in the death-rate of Puffins and Guillemots, many specimens of both species being

washed ashore, the former in their winter dress, whilst the latter had assumed the brown head and neck indicative of the breeding plumage. On the 22nd a solitary Shore Lark was noticed picking amongst the grass opposite the Fishermen's Square. For the next few days the weather continued fine, and on the 27th Swallows, House Martins, and Sand Martins arrived in considerable numbers, whilst Ring Ouzels were also reported from the moors in Cleveland. On the 30th a Land Rail was picked up in a field near Guisbro'. Several recently formed nests of the Ring Dotterel were found at the Tees-mouth on the 28th, and by the 3rd of May one of them contained its full complement of four eggs. The first nest of the Redshank, with four eggs, was reported on the 10th. On the 3rd the cheery note of the Sedge Warbler was heard, and some of the birds were seen in the fields adjoining the coast. On the same day several Terns, probably *S. macrura*, were seen out at sea, migrating north-west.

Very little of interest to ornithologists was reported during June; but towards the end of July a few Whimbrels were to be seen, invariably the first of the autumn visitants to our shores; even as early as the first week in July they have been known to frequent the Tees-mouth. On the 31st a Fulmar Petrel was washed ashore on the Coatham sands, having evidently died at sea.

On August 7th the shrill, wild notes of the Curlews were heard as they passed overhead at dark; and again, on the 13th, hosts of shore birds disturbed the nocturnal calm by their loud and frequent calls. The following day small flocks of Knots were dispersed here and there along the sands around the Tees-mouth. On the 21st a Knot, with chestnut breast, and a Greenshank were shot, and adult Sanderlings, with some immature Turnstones, put in an appearance. The first Bar-tailed Godwit was killed on the 29th.

As September came in there was an abundance of shore-birds of the usual kinds; another Greenshank was shot on the 3rd. On the 10th, whilst out in a boat about 300 yards from the shore, a small flock of birds passed over the sands; they were called within gunshot and two were procured, which proved to be Pigmy Curlews. During this and the two following days there were great numbers of Sandwich Terns, adult as well as immature, passing from N.W. to S.E., and evidently bent on reaching more

southerly and warmer climes with the least possible delay, for they did not exhibit any of the piscatorial habits of their Common and Arctic cousins, but flew straight onwards. For several days Richardson's Skuas had been frequenting the Tees Bay in considerable numbers, and on the 12th forty or fifty, comprising both the adult dark and light-breasted varieties, were seen engaged in their piratical pursuits of the poor unfortunate Terns which were feeding on the herring "sile." The Skuas generally hunted in pairs, and occasionally one of each form would be noticed engaged in a chase. Rain accompanied the equinoctial gales which raged on the 20th and following days. Flocks of ducks passed on the 21st, and a Velvet Scoter was shot while flying over the sands near the Breakwater.

On October 1st, a Fork-tailed Petrel was captured by a cat, and brought into the kitchen of Easby Hall; there is but little doubt that it had been blown across from the opposite coast by the severe gales which brought so many of these little ocean wanderers under the observation of naturalists on the western shores of our islands, as reported at the time in 'The Field.' So far as records show, this is but the second reported occurrence of this Petrel in Cleveland within the past forty years. Southerly winds, with heavy rain at intervals, commenced on the 6th, and continued for a few days, during which flocks of ducks and larks were constantly passing; a Short-eared Owl was also seen crossing over from the sea. On the 12th Hooded Crows and Peewits appeared, and fresh visitants kept coming in till the 21st, on which day there was an unusually great migratory "rush": from early dawn till late in the afternoon thousands upon thousands of birds kept crossing inland from the sea; the flocks consisted chiefly of Thrushes, Redwings, Fieldfares, Chaffinches, Larks, Peewits, and Hooded Crows, interspersed at intervals with a few Snow Buntings, while out at sea ducks were seen migrating to the N.W. This mighty influx diminished on the 22nd, although every day for a week or so the tide of migration flowed. On the 16th a Little Grebe sought refuge on the railway-station platform, from a strong S.W. gale that was blowing, and was promptly captured by the watchful policeman on duty. Three Ruffs were seen in a field near Redcar, and one—an immature example—was shot. On the 23rd a Red-necked Phalarope was picked up on the sands near the Tees-mouth; this is the first specimen we have

seen in the flesh here. On the 25th a Redcar pilot captured a Great Grey Shrike about three miles off at sea; it was evidently in an exhausted condition, and alighted on the "sheet," where it remained until it was taken up. Towards the end of the month frequent occurrences of Short-eared Owls were reported; one which was shot on the sand-hills had been feeding on Meadow Pipits, its claws being thickly matted with the blood and feathers of its prey. A moderate N.W. wind was blowing on the 26th, and brought over several Woodcocks, two of which alighted on the sand-hills, where they were shot. Numerous Gannets and many flocks of Ducks were passing at sea. On the 29th and 30th, E. wind, foggy, Hooded Crows and Larks, in large bodies, arrived. The Hoodies are generally noticed in largest numbers during thick weather in October and November. Two Purple Sandpipers were feeding at the edge of the water on the shore east of Redcar on the 31st.

The early part of November was conspicuous for bad weather, and there was little to note till the 19th, when a Red-necked Grebe was shot off Redcar, and, the same day, Mussell, the Middlesbro' taxidermist, had a Spotted Crake which had been shot on the marshes on the north side of the Tees. On the 16th and 21st E. and N. winds prevailed, and large flocks of Snow Buntings passed. From the 18th to the 23rd we have to record the late stay of Swallows and House Martins, which were to be seen continually hawking about on the front and in the High Street. For full particulars reference may be made to Mr. J. E. Harting's article on "Belated Swallows" in 'The Field' of 30th January, 1892. On the 26th three Eider Ducks were observed swimming near Redcar Pier: this bird is very rare with us, although it seems quite probable that, owing to the strict protection in force at the Farne Islands, where it breeds abundantly, we may in the future have more opportunities of recording its occurrence on the Yorkshire coast.

On December 18th an immature Great Northern Diver was shot at sea, and two flocks of Geese passed over. On the 26th a large number of Snow Buntings arrived; and again, on January 2nd, 1892, during a N.W. gale, quite a multitude of Snow Buntings and Sky Larks migrated, coming in without intermission during the whole day. On the 7th, N.E. breeze and heavy snow, Redwings and Fieldfares passed in large bodies to the N.W. Hosts

of adult and immature Common Gulls followed the same route on the 11th and 12th, stormy weather still prevailing. On the 12th a fisherman "brought down" an immature Glaucous Gull close to the east end of the town; and an adult Grey Phalarope was secured near the Tees-mouth. The 24th, S.W. light breeze, witnessed the last arrival of winter migrants, comprising Thrushes, Fieldfares, and Larks, while, a little after mid-day, a large flock of Peewits brought up the rear.

On the 10th, 11th, and 12th of February we were attracted by the vast numbers of Kittiwakes about a mile out at sea, and rowed off to ascertain, if possible, the reason of this unusual assemblage of Gulls. Both east and west, for miles, as far as the eye could reach, their graceful, white-winged forms were to be seen, some busily engaged dipping into the water, and others, sweeping through the air, kept darting down to seize on some objects at the surface. Two or three were shot, and it was found that their mouths contained a quantity of small crustacea, with which the whole sea seemed literally alive; a few days afterwards thousands of these were washed ashore by sea winds, and were strewn all along the edge of the shore, where they afforded plenteous food for the Starlings and other frequenters of the tidal line.*

On the 18th a female Great Northern Diver was shot in the estuary, and a Fulmar was washed up on the beach on the 21st. On the 26th two more Great Northern Divers and a Great Crested Grebe were seen near the Tees-mouth.

* Several specimens of these Crustacea were collected and sent to Mr. W. D. Roebuck, who forwarded them to Canon Norman for identification. Subsequently Mr. Roebuck has written to say that Canon Norman has declared them to be *Euthemisto compressa*, a species not hitherto recorded from British seas.

ORNITHOLOGICAL NOTES FROM MID-HANTS FOR 1892.

BY SUTTON A. DAVIES.

JANUARY.

This month was, on the whole, a cold one, but little of interest occurred. On the 18th a fine pair of Bitterns, *Botaurus stellaris*, male and female, were shot at Stockbridge, and in the course of the last week two Curlews, *Numenius arquata*, were shot out of a flock of seven at King's Somborne. Towards the end of the month the weather became very mild, and most of the commoner birds began to sing.

FEBRUARY.

On the 1st of this month Mr. Fisher saw a Hawfinch, *Coccothraustes vulgaris*, in a garden in Winchester; another bird came into the hands of Mr. Chalkley, the local birdstuffer, in the course of the month, which had been shot at Otterbourne, while I myself saw one on the 15th.

On the 2nd we visited Fisher's Pond, one of the few pieces of water in this part of the county. The keeper told us that there had been very few ducks on the pond this winter; he had only seen one Teal and one Pochard. It is strange that the Teal should be so scarce with us; it has not yet been satisfactorily proved to have nested in Mid-Hants, though the Hon. H. A. Baring tells me that young birds are frequently to be seen on Alresford Pond in late summer, and Mr. W. H. Turle, of Newton Stacey, Stockbridge, says it certainly breeds on the Test, though he has not yet found the nest.

On the 5th we witnessed a curious sight—a gathering of Partridges for pairing. Some dozen birds were assembled on a smooth patch of turf in a turnip-field; they were making a great noise, continually fighting, squabbling, and pursuing one another. After this date I saw no more coveys. On the 14th Mr. Cobb reported the first twig-bearing Rook, and I saw a large hawk circling over Longwood Warren, which subsequently proved to be a Rough-legged Buzzard. On the 20th the migration of Golden Plovers began, and Mr. Cobb saw a small flock on the downs. On the 25th, the weather being very mild, a Blackbird began to build, but was eventually stopped by the snow at the beginning of March.

MARCH.

On the 5th we found a Stock Dove sitting on her eggs—a somewhat early date; and on the 6th the Black-headed Gulls, which visit us daily from Southampton Water from September to April, began to assume the dark brown hood. On this date we saw a flock of six grey geese feeding in a stubble-field on the downs; we could not determine their species. On the 7th Mr. Chalkley received a young male Peregrine, *Falco peregrinus*, shot near Stockbridge. On the 13th (as recorded in 'The Zoologist' for April, 1891, I found a Rough-legged Buzzard, *Buteo lagopus*, alive in a rabbit-trap, where I had seen a large hawk circling on Feb. 14th. On the 17th we found a second early Stock Dove's nest. On the 19th the Peewits settled on the fields for the breeding season, and in walking over a turnip-field we picked up some half-dozen which had been killed by a weasel or stoat whilst roosting. On the 20th Chiffchaffs were singing loudly in the hedges. Rooks were rather later than usual in laying this year; only two nests, out of thirty, contained eggs, and two was the largest number of eggs found, on the 22nd. On this date the Willow Wrens arrived. On the 26th Mr. E. D. Luard, writing to 'The Field,' reported a Swallow from Winchester. On the 27th Wheatears arrived, and we saw the last winter Snipe. A great number of Snipe remain to breed on Bransbury Common, near Stockbridge, and a few nest every year in the water-meadows near Alresford; but I cannot find any instance of their nesting at Winchester; they may occasionally do so at Fisher's Pond, where I have observed them late on in April. On the 30th, a correspondent of the 'Hampshire Independent' reported a Swallow from Romsey.

APRIL.

On the 1st I saw a Swallow above Fisher's Pond. Only one pair of Coots had laid, and only two eggs were in the nest. I have found a clutch of nine eggs "hard-set" as early as March 25th there. On the 3rd I found the first clutch of Peewit's eggs. After the 6th the Gulls paid us no more regular visits; Mr. A. W. S. Fisher saw one Common Gull, *Larus canus*, on the 10th. Gulls are probably attracted to Winchester by the Sewage Farm, and the food it provides; they do not visit Stockbridge or Alresford at all regularly. It is strange that they should find it necessary

to return every evening to Southampton Water to roost. Small flocks may be seen flying down the Itchen valley every afternoon from 3 to 4 o'clock, by which time all have left the Sewage Farm and water-meadows. On the 7th I saw a House Martin, and Mr. Cobb also saw one at Fisher's Pond. Whilst walking over the downs I observed a pair of Peewits behaving in a curious way, and by dint of careful stalking I managed to get near enough to observe them. The cock bird was standing motionless at about three yards from the hen, on the look out for danger; the hen, with her tail elevated, was crouching in a tuft of grass, and keeping up a continual upward motion with her breast, as if to shape the nest. Meanwhile she uttered a hissing noise, which exactly resembled the sound made by a Noctule. On going up to the place where she had been I found a well-formed nest. On the 10th the Tree Pipit arrived; Mr. A. W. S. Fisher heard and saw the Nightingale in a small coppice on the downs. Nightingales are not common in the immediate neighbourhood of Winchester, because of the lack of places suited to their habits; but at Hursley Otterbourne and Colden Common they are numerous. Mr. Fisher also saw a flock of Golden Plover, and on the 11th I saw the same birds and heard the Nightingale. On the 12th I saw a Sand Martin on the Test, near Stockbridge; Fieldfares had not yet left. On the 22nd the Wryneck, *Iynx torquilla*, arrived, one being shot at Eastleigh. I have never seen or heard one in this district, and Mr. Turle agrees that they are quite rare here; they are said to be common near Southampton. On the 29th a young male Hen Harrier, *Circus cyaneus*, was shot at Titchbourne, and came into the hands of Mr. W. Chalkley.

MAY.

The Swift, *Cypselus apus*, arrived on the 3rd, and Turtle Doves were heard on the 7th. On the 8th we saw a solitary gull in the water-meadows near Twyford; it was an unchanged Black-headed Gull. On the 27th a female Hobby, *Falco subbuteo*, was shot on her nest in Dole's Wood, near Andover; Mr. Turle was told a Sparrowhawk had been shot, but on climbing the tree he found a beautiful Hobby lying dead on her eggs, which were smashed to atoms. I saw several Common Sandpipers, *Totanus hypoleucus*, on migration; Mr. Turle says they are common at Newton Stacey in August, on the return migration, but that they have not nested there.

JUNE.

The 2nd was a very early date for "hard-set" Swifts' eggs; on this date we found the first clutch of Reed Warbler's eggs in the willows. The first nests in this part of the country are always built in willows; it is not till the reeds have grown to a good height that they build in them. A clutch of Peewit's eggs found on the 4th must have been a second brood. On the 9th I was shown a Great Tit's nest at the bottom of a perpendicular pipe, about six feet long, ventilating a cesspool. Flying up straight for six feet must have been very hard for the old birds, and the rumbling noise they made in so doing sounded very strange. On the 11th I found a Cuckoo's egg in an empty Reed Warbler's nest. How did the Cuckoo know that the Reed Warbler had not hatched off, but was going to lay, as she did about four days afterwards? On the 20th, whilst walking through a fir-plantation, we saw a Long-eared Owl roosting, and by climbing up cautiously I caught it—a this year's bird, nearly full grown. On the 28th Mr. R. C. R. Ensor saw six Stone Curlews, *Ædicnemus scolopax*, on a large warren near Hursley; these birds still breed in some numbers in Mid-Hants, especially round Newton Stacey (W. H. Turle *in litt.*). On the 29th I identified a Wood Lark, *Alauda arborea*, at Colden Common; the Rev. P. H. Owen told me it had been there all the season, so it probably nested. On the 30th I saw a large hawk skimming over the side of the downs; it seemed most like a Common Buzzard, *Buteo vulgaris*,—a bird which Mr. Turle found nesting near Andover on May 11th, 1887. The Hon. A. H. Baring tells me (*in litt.* Dec. 10th), that a man cutting the grass at Itchen Stoke found a nest of the Quail, *Coturnix communis*, and luckily mowed over the sitting bird's head; she stuck to her eggs and hatched successfully. One young one was subsequently killed by the mowing-machine in a field of mustard. Mr. Turle did not find the nest this year; but, he says, a good many young birds were shot round Newton Stacey—on one occasion eleven in one day. Two broods of Tufted Ducks, *Fuligula cristata*, were hatched on the lake at the Grange, Alresford, as in 1891. We are very badly off for ducks in Mid-Hants, but the Tufted Duck occasionally occurs in winter; Mr. Turle says (*in litt.* Dec. 12th), "about seven birds are now on the pond at Laverstoke."

JULY.

On the 6th I saw a flock of Herring Gulls, *Larus argentatus*, flying over Winchester, and on the 16th Mr. Turle, writing to the 'Hampshire Chronicle,' recorded seeing a brood of young Crossbills, *Loxia curvirostra*, being fed by the old birds in Southampton Cemetery on the 10th.

SEPTEMBER.

On the 9th a Spotted Crake, *Porzana maruetta*, flew against the telegraph-wires at Itchin Abbas, and was killed. Mr. Turle sees this bird every year at Newton Stacey, and, though he has not yet found the nest, believes that it breeds there. It has been shot at Marwell, one being in the possession of Mr. Percy Standish. On the 17th we found a Wood Pigeon's nest, with fresh eggs; on the 19th the Grey Wagtail, *Motacilla melanope*, arrived; on the 22nd I saw the last Chiffchaff, *Phylloscopus rufus*; and on the 29th the last Sedge Warbler, *Salicaria phragmitis*. On the 25th the Gulls began their daily visits. Pied Wagtails, *M. lugubris*, were very numerous in the water-meadows, in small parties of from four to twenty. Kingfishers, *Alcedo ispida*, are perceptibly decreasing; they are rare everywhere, except at the birdstuffer's, where a very large number are sent in yearly, especially from round Alresford.

OCTOBER.

On the 3rd we found two Wood Pigeons' nests, with young birds; the Hon. A. H. Baring writes me (Dec. 10th) that a number of young birds were shot late on in autumn at Alresford. On the 7th Redwings, *Turdus iliacus*, arrived, and have been more common than usual this winter. On the 9th Mr. R. C. R. Ensor found the remains of a Stone Curlew on Longwood Warren, and on the 18th he saw the first Fieldfares. These birds were very late this year, as we saw no more till Nov. 3rd; they have been scarce all the winter. On the 23rd a fine male Peregrine was received by Mr. Chalkley from Warnford, where it was shot by a keeper. He also received a Great Spotted Woodpecker, *Dendrocopos major*, from Otterbourne, and a Lesser Tern, *Sterna minuta*, from Stockbridge, during the month. The Pied Wagtails, which had been so common, almost totally disappeared, their place being taken by large numbers of the Grey Wagtail. The Hon.

A. H. Baring tells me he saw some Gulls on a ploughed field at Alresford.

NOVEMBER.

The winter Snipe arrived in large numbers on the 3rd; and on that date two immature Herring Gulls, *Larus argentatus*, visited us with the others. On the 5th I saw the last House Martin, *Chelidon urbica*; on the 17th the last Swallow, *Hirundo rustica*, and on the 22nd four Sand Martins, *Cotyle riparia*. On the 25th a correspondent of the 'Hampshire Independent' saw a "Swallow" at Romsey. On the 13th, and on several subsequent days, I visited a small hazel-coppice, to see the vast flocks of Starlings that congregate there to roost. Every twig in the coppice was lined with birds as with leaves. The whole place was black with birds, and on disturbing them they got up, layer after layer, with a noise like the breaking of a vast wave. We could hear the roar of their combined chattering two miles off. On the 28th a female Dipper, *Cinclus aquaticus*, was shot at St. Cross by a man who was snipe-shooting. According to the Rev. J. E. Kelsall's 'List of Hampshire Birds,' this will be the third identified specimen from Hants. Rumours as to its breeding in the New Forest are apparently without foundation. I saw two Water Rails on the 17th—a bird that escapes observation from its skulking habits. It has bred at Avington, and does so every year at Newton Stacey (W. H. Turle).

DECEMBER.

Writing from Alresford, on the 9th, the Hon. A. H. Baring reported having just seen a Peregrine, *Falco peregrinus*, "which had been about nearly all the year." Large flocks of Peewits, *Vanellus vulgaris*, were to be seen flying up and down the valley at an immense height. I observed a large migration of Wood Pigeons on the 18th. No Wigeon, *Mareca penelope*, have been seen at Alresford this year (Hon. A. H. Baring *in litt.*), though Mr. Turle has seen some this winter on the Test; but Mr. Chalkley received an albino hen Wild Duck from Alresford; the bird was too long to admit of its being a call-duck, and a gentleman says he recognised it as a "flapper" amongst a brood of ordinary Wild Ducks.

MEMOIR OF THE LATE SIR RICHARD OWEN, K.C.B.,
LL.D., F.R.S.

THE many obituary notices which have lately appeared of this distinguished zoologist and palæontologist have well nigh rendered unnecessary any further testimony of his worth, Yet it would ill become us, in a Journal devoted to the popular aspect of that science of which he was a professor, to pass unnoticed the services rendered by him to the cause during a long and busy life.

We have only to look at the list of honours bestowed upon him, as enumerated in 'The Times' of Dec. 19th, to see that a man of no ordinary talent and ability has lately passed away from us. In 1842 the Royal Society conferred on him the Royal Medal for his Memoirs on the general economy of the Monotremes and Marsupials, and in 1846 the same Society decreed to him the Copley Medal. In 1851 the King of Prussia sent to him the *Ordre pour le Mérite*. In 1855 the Emperor of the French bestowed on him the cross of the *Légion d'Honneur*. The Universities of Oxford, Cambridge, and Dublin conferred on him honorary degrees. The Royal College of Surgeons of Ireland made him an Honorary Fellow, and most of the European and American societies numbered his name on their lists of honorary or corresponding members. In 1857 he was elected President of the British Association for the Advancement of Science. In 1859 he was chosen one of the eight foreign associates of the Institute of France (in succession to Robert Brown). The Emperor of Brazil, in 1873, gave him the Imperial Order of the Rose; while in the same year the Queen conferred on him the Order of the Bath, of which Order he was made a Knight Commander in December, 1883, on the occasion of his resigning the post of Superintendent of the Natural History Museum. In 1874 the Academy of Medicine, Paris, elected him as one of their foreign associates, in succession to Baron Liebig. In 1882 the King of Italy sent him the Order of St. Maurice and St. Lazare. And all these honours were the reward of merit, fairly earned by the closest investigation of Nature's secrets, and by the study and elucidation of many important problems in zoology, comparative anatomy and palæontology.

Born in Lancaster in July, 1804, he manifested an early taste for the study of medicine, and after matriculating at Edinburgh in 1824, he entered St. Bartholomew's Hospital as a student in 1825. The following year, having obtained his diploma at the Royal College of Surgeons, he commenced practice on his own account, in Serle Street, Lincoln's Inn Fields, but soon found occupation still more congenial to him in the curatorship of John Hunter's collections in the College of Surgeons,—a post to which he succeeded on the death of William Clift, whose daughter he married,—and in the preparation of a catalogue of these collections, which was urgently needed to enhance their value and utility. Owen undertook this in 1828, and the first part of the catalogue appeared in 1830. This year was to him an eventful one. He had joined the Zoological Society as an original member, and had made the acquaintance of Cuvier when the latter came to London, paying him a return visit in Paris the following year. It need scarcely be said that this acquaintance with the great French anatomist had a most important influence upon his career. Especially was he impressed with the collections formed by Cuvier and Valenciennes for their great work on Fishes, in which, more particularly with the fossil forms, he became fascinated.

Four years later he was appointed to the newly-established Chair of Comparative Anatomy at St. Bartholomew's Hospital, and was elected a Fellow of the Royal Society. After his marriage to Miss Clift he succeeded—in 1836—Sir Charles Bell as Professor of Anatomy and Physiology to the College of Surgeons, and the Trustees of the Hunterian Museum having about this time established the Hunterian Professorship, Owen was elected thereto. In 1837 he edited 'Hunter's Animal Economy,' and continued to fill both chairs till 1855; during this time he published ten more volumes of the catalogue of the Hunterian Collection, and on Mr. Clift's death he became also Conservator of the museum. He now gradually retired from the practice of his profession, and devoted himself entirely to scientific pursuits.

"It is quite amazing," says the writer of an able memoir in 'The Times' (Dec. 19th) "to take even a rapid survey of the amount of work published during this period." Not to mention the very numerous memoirs contributed to the Transactions of

the Royal, Linnean, and Zoological Societies, the following separately published works may be noticed:—the volumes on Odontography, the Lectures on Comparative Anatomy, on the Archetype and Homologies of the Vertebrate Skeleton, on the Nature of Limbs, on Parthenogenesis, on Fossil Reptiles, on the Gigantic Fossil Birds of New Zealand, on Fossil Mammals of Australia, and on the Great Mylodon and other Megatherioid Quadrupeds of South America.

Later on, when he had quitted the College of Surgeons to become Superintendent of the Department of Natural History in the British Museum, a post which he filled for twenty-seven years, the new surroundings seemed to give fresh impetus to his work, and his contributions to science were more numerous than ever. During this period he published Memoirs on the British Fossil Reptiles of the Mesozoic Formations—Pterodactyles, 1873–1877, and of the Liassic Formations—Icthyosaurs and Plesiosaurs, 1865–1870; on the British Fossil Cetacea from the Red Crag, 1870; on the Fossil Reptilia of South Africa, 1876; on the Classification and Geographical Distribution of Mammals, 1859; and a Manual of Palæontology, 1861. The Royal Society's Catalogue of Scientific Papers credits him with more than 360 titles, and amongst these we find a great variety of themes ranging throughout the animal kingdom from Anthropoid Apes to Entozoa. Perhaps the subject in which he most delighted was the investigation of the history of the gigantic Extinct Birds of New Zealand, and the reconstruction of their skeletons from the remains forwarded to him by travellers and explorers. In this direction his labours were of the highest importance, and, so far as his materials permitted, they may be said to have been exhaustive. His papers on the various forms of *Dinornis*, as well as those on the Dodo of Mauritius and the Great Auk, all extinct of their kind, are amongst the most remarkable productions of the palæontological acumen. It was a well-deserved compliment on the part of the late John Gould, when describing a new species of New Zealand Kiwi, to name it in honour of Owen, *Apteryx oweni*.*

* A readily accessible and well engraved figure of this bird, drawn by the late T. W. Wood, from a living specimen forwarded to this country by the Acclimatisation Society of Otago, will be found in Harting and Mosenthal, 'Ostriches and Ostrich Farming,' p. 178 (2nd edition, 1879).

Hardly less keen was the interest which Owen manifested in extinct reptilian forms, many of which he showed to be closely akin to birds; and his great work on 'British Fossil Reptiles,' published in 1884, in three quarto volumes, profusely illustrated, is regarded by many as his most important contribution to palæontology. This appeared the year after he had retired from the British Museum, and had seen the accomplishment of his fondest hopes in the erection and opening of the new museum in the Cromwell Road for the reception of the natural-history collections which were removed from Bloomsbury. It was mainly through his exertions that this scheme was carried out, and although when first proposed in Parliament it met with violent opposition in certain quarters, the wisdom of the step becomes more and more apparent every day.

The last chapter in a long and busy life was reached when the venerable naturalist at length retired from official work. Having by dint of argument persuaded the country to approve the building of a natural-history museum for the reception and proper display of the national collections, and having filled shelves with the works of his genius for the benefit of future students of nature, he felt that his mission in life had been accomplished, and that he might seek that repose which he had so well earned. In 1852, at the close of the Great Exhibition, in which he had taken an active part as one of the councillors of the Prince Consort, he was staying on a visit at Osborne. On the day of his departure, Prince Albert, thanking him for all the trouble he had taken to carry out his wishes in regard to the Exhibition, enquired whether there was anything he could do for him in return. Owen replied that he was looking about for a house in some retired spot where he might find that quietude which is so essential to deep study, and that there was a little house in Richmond Park (Sheen Lodge), then vacant, which seemed to him to embody all that could be desired. The Prince promised to make enquiry concerning it, and shortly afterwards wrote to express the gratification which he felt in being able to place it at Owen's disposal, rent free, for life. Here then he resided until his death; and only those who had the privilege of his intimate acquaintance could realize fully his calm enjoyment of the sylvan scenery by which he was surrounded. Seated upon a rustic bench under one of the many old trees amongst which the

20366

house lies embosomed, he could survey, as if it were his own, the great expanse before him of Richmond Park. To the pond in front of his lawn the deer would come trooping to drink. Squirrels gambolled round the ancient trunks, and descended to feed before him; blackbirds and thrushes charmed him incessantly with their songs; and during the summer months warblers of all kinds abounded in the old-fashioned garden and shrubberies, which he allowed to run wild for their protection. It was there that he delighted to sit and converse with his friends and visitors, none of whom departed (it may surely be said) without having learnt much that he did not know before. And there it was that, amidst such peaceful surroundings, on the 18th December last, he passed quietly away, in the eighty-ninth year of his age.

NOTES AND QUERIES.

The late Mr. H. T. Stainton, F.R.S.—By the death of Mr. Stainton, on December 2nd, at the age of seventy, entomological science has lost one of its most original and prominent workers. As a specialist he turned his attention chiefly to the minute insects known as Micro-Lepidoptera, which are often of marvellous beauty, and almost equally marvellous in their habits; and in connection with these his principal work is the ‘Natural History of the Tineina,’ in four languages, with many fine plates, a book which extended to more than a dozen volumes. He also published a ‘Manual of British Butterflies and Moths,’ which remains the most concise and useful handbook on the subject. A host of other works and memoirs in journals and the Transactions of Societies, from his pen, testify to his untiring industry. As an entomological journalist he established the (now extinct) ‘Annual’ and ‘Intelligencer,’ and he was one of the founders of the ‘Entomologists’ Monthly Magazine’ in 1864, and continued one of its editors until his death. As regards general Natural History, he was for many years Secretary of the Ray Society, of the Zoological Record Association, and one of the secretaries of Section D of the British Association for the Advancement of Science. He had been a Fellow of the Entomological Society of London, of which he was an ex-president, since 1848, and of the Linnean Society since 1859, and at one time a vice-president. In 1867 he was elected Fellow of the Royal Society, and had been on the council. Mr. Stainton was born in London in 1822, and died at Lewisham, where he had resided all his life.—‘*The Times*,’ Dec. 12th.

MAMMALIA.

The Deer of British Guiana.—Five species of deer appear to be distributed in the colony. The common brown Savannah-deer, *Cariacus savannarum* = *C. mexicanus*, is so well known that it needs no description, the branching antlers, with the inner basal snag, sufficiently distinguishing it. The large red Wood-deer, or Brocket, with the simple horns, *Coassus rufus*, is also well known, being commonly obtained about the back of the estates, more especially on the Essequibo coasts. The “Welbisiri,” or small Wood-deer, or Brocket, *Coassus nemorivagus*, is common only in the forest tracts of the inner part of the country. In spite of its being a very common species in the interior, it was only quite recently that I was able to secure a suitable specimen for accurate identification, and it seems likely that the name “Welbisiri” is given to two distinct species. *C. nemorivagus* is much smaller than the red Wood-deer, and is of a very pale brownish grey or white colour, with a frontal streak before the eyes, the horns very much finer and shorter. The “Welbisiri” was referred in Schomburgk’s “Reisen” to the species *C. humilis*, Benn, but it is widely separated from this form. A species of Brocket, also known as “Welbisiri,” is frequently mentioned, by bushmen in the colony, as being much smaller than the above,—scarcely larger, in fact, than the fawn of the red Wood-deer,—while it possesses the lines of pale yellowish spots. This form is said never to lose the spots of the young stage, but to retain them throughout life. It would thus appear to be distinguishable from the other small grey Brocket, *Coassus simplicicornis*, which has been recorded from the colony by Schomburgk, though it is possible that those with the spots, which were considered adult, were really only the young of this species. There is no frontal streak in *C. simplicicornis*. A very different deer from any of the preceding is only represented in the Museum Collection by a skull, the characters of which mark it as referable to *Blastocercus paludosus*. There is no inner basal snag in this form, and the antlers grow to some length ere they divide into two, about equal, branches. In our specimen these antlers are thick and very rough, but unfortunately, though it was obtained in the colony, its exact locality is not known.—J. J. QUELCH (Georgetown, British Guiana).

Old English Black Rat at Bristol.—It may be of interest to some of your readers to know that a Black Rat was killed in Bristol, in July last, in the offices of Messrs. Spillers and Bakers. Presumably it was *Mus rattus*, as I know Bristol was one of its last strongholds, though now it is rare there, as everywhere. I unfortunately could not obtain the body for identification, but hope to obtain any others that may be trapped. I do not know whether the occurrence is now sufficiently rare to be worth

chronicling. I remember eleven years ago seeing a colony of them in a ditch on Donside, in Aberdeenshire.—CHARLES GARNETT (Rownham House, Clifton).

CETACEA.

Bottle-nosed Whale on Lincolnshire Coast.—A small Bottle-nosed Whale, *Hyperoodon rostratum*, came ashore at Skegness, on the Lincolnshire coast, on the 12th September last. Unfortunately I did not hear of the occurrence until after the carcase had been buried. Subsequently, however, I had it partially exhumed, and have preserved the skull. The animal was said to measure 24 ft. in length, 10 ft. in girth, and to weigh about four tons.—G. H. CATON HAIGH (Grainsby Hall, Great Grimsby).

BIRDS.

Experiences in breeding Parson Finches.—Respecting the breeding of the Banded Grass Finch, *Poëphila cincta*, generally known under the dealer's name of "Parson Finch," Herr Wiener in Cassell's 'Cage Birds' (pp. 394, 395) writes very favourably; he adds, "In the aviary it neither disturbs the smallest African Finches, nor is it easily disturbed by less well-behaved birds." Knowing that Herr Wiener had had considerable experience in the breeding of small birds, I purchased a pair of "Parson Finches" in 1891, and turned them in with my small finches in one of my large aviaries. The result was that very shortly afterwards they built in one of the nesting-boxes, and the hen then died egg-bound. I promptly replaced this hen, with a like result. Shortly afterwards a hen of the Green Avadavat, which was sitting on four eggs in one of the boxes, was so constantly disturbed by the widowed cock Parson Finch that she deserted her nest. I now caught the offender and turned him into one of my cool aviaries, purchased a mate for him, which nested in a bush and died egg-bound. About June last Mr. Abrahams kindly gave me a hen to replace the one that had died, and as (in the meantime) I had acquired three other cock birds, I purchased three more hens; so that I started fairly with four pairs. Two of these hens went to nest, one building in a bush, the other in a box, but both died egg-bound, leaving me with four cocks and two hens. Now began a series of desperate encounters, in which one cock was soon knocked on the head by the other three. The two remaining hens now built, one of them in a bush, and again died egg-bound, the other in a box; the latter bird laid an egg and began to sit, but was constantly disturbed by the widowed cock-birds, when both she and her mate immediately pursued the intruders, one of which they killed. In due time two young Parson Finches left the nest, and in two days the unpaired cock bird killed them both. About a fortnight later, the hen went to nest again, and

I found her, one evening, crouched in a corner, egg-bound. I caged her, and placed the cage on a rack over the kitchen fire; in two days she laid a half-shelled egg, and recovered her health and spirits. I now caught the cock bird and placed my pair in a large breeding-cage, where they lived happily for two or three weeks, when they built a nest, and the hen then again got egg-bound and died. I wrote to Mr. Abrahams telling him of my failures, and he was good enough to send me a pair to make a further experiment. These have not yet attempted to go to nest; but I hope for good results this time, for the following reasons:—The Banded Grass Finch is the most pugnacious little bird with which I have ever had to deal—as quarrelsome as an English Sparrow. On this account he should not be associated, when breeding, with other birds. Then the cock bird, in his fussiness over his hen, when other birds are about, prevents her from eating the requisite amount of lime to produce shell, often driving her away from the cuttle-fish bone or egg-shells just as she is beginning to peck them. Lastly, in a mixed aviary, these birds do not confine themselves strictly to their proper food, but eat a certain quantity of more oily seeds intended for other species, and thereby become too fat to breed safely. A fresh pair, isolated in a good-sized breeding-cage, therefore has the best chance of succeeding in rearing a family. As regards the Parson Finch's amiability in the aviary, it is well enough when not breeding; and though too inquisitive and meddling for smaller birds, it is not absolutely vicious; but when it chooses a nest-box and has built in it, every intruder is knocked on the head; in fact, my Parson Finches killed at least one—and I believe several—Zebra Finches, *Amadina castanotis*, which ventured into their home. I am unable, therefore, on any point, to endorse Herr Wiener's observations respecting *Poëphila cincta*.—ARTHUR G. BUTLER (124, Beckenham Road, Beckenham).

Macqueen's Bustard on the Yorkshire Coast.—It will interest your readers to know that a fine specimen of Macqueen's Bustard, *Otis macqueeni*, J. E. Gray, was shot near Marske, on the north-east coast of Yorkshire, on the 5th October last. When first observed, it was walking about in a large, bare pasture field near the edge of the sea-bank, about 100 ft. above the level of the sea. It was a very misty day, and the bird when approached squatted like a game-bird, and seemed unwilling to rise. It was evidently very tired, but on a nearer approach it rose straight up in the air, and was easily shot. It was sent to Mr. Pearce Coupe to be preserved, and he identified it as Macqueen's Bustard, and afterwards ascertained it to be a male, which is fully proved by its size and handsome ruff. It has been purchased for, and is now in, the Museum at Newcastle-on-Tyne. The bones of the body have also been preserved and presented to the Museum by Mr. Coupe, who reports that he ate part of the flesh and found it savoury, but somewhat tough. The bird is in handsome

(breeding?) plumage, the tail delicately barred, and the crest not quite so large as in the figure in 'Yarrell' (4th ed. vol. iii. p. 221). It is a curious coincidence that the only other British-killed specimen on record was shot at the same time of year—namely, on the 7th October, 1847.—RICHARD HOWSE (Museum, Newcastle-on-Tyne).

Great Grey Shrike in Surrey.—At the end of October last, when crossing the western end of Walton Heath, I noticed a bird sitting on the top of a thorn-bush, in a position which reminded me of that of the Red-backed Shrike. On approaching, however, I saw that it was a Great Grey Shrike. I followed it for some way towards the middle of the Heath, and had repeated opportunities of seeing it.—ERNEST S. SALMON (Clevelands, Reigate).

Fork-tailed Petrel in Somersetshire.—A Fork-tailed Petrel was brought to me, on the 10th December last, which had been shot within a few miles of Bridgwater—about ten miles from the sea. I believe only two or three have been previously recorded for Somerset. It was, I think, killed on the 7th.—F. A. KNIGHT (Brynmelyn, Weston-super-Mare).

Red-throated Diver and Spotted Crake in Somersetshire.—A Red-throated Diver, *Colymbus septentrionalis*, was killed on the river, about three miles below Bridgwater, a few days ago, and is in the possession of Mr. Tucker, of this town. On the 1st November I bought a Spotted Crake, *Crex porzana*, which had been shot near here.—H. B. GOLDSMITH (King Square, Bridgwater).

Additional Notes on the Birds of Donegal.—Prof. Leebody, of Londonderry, has contributed an interesting paper upon the birds of Lough Swilly to the 'Irish Naturalist,' in which he has noticed, at Inch, the following species, not included, or only inserted as very rare, in my "Notes upon the Birds of Donegal":—

Gadwall, *Anas strepera*, Linn.—Three have been shot at Inch during the last three years; very rare.

Shoveler, *Spatula clypeata*, Linn.—One or two pairs bred about Inch.

Pintail, *Dafila acuta*, Linn.—Common about Inch in February and March; scarce in winter.

Goldeneye, *Clangula glaucion*, Linn.—Plentiful at Inch from October to March.

Long-tailed Duck, *Harelda glacialis*, Linn.—Generally one or two got at Inch each winter.

Goosander, *Mergus merganser*, Linn.—One shot at Inch a few years ago; very rare.

Smew, *Mergus albellus*, Linn.—A couple shot, in January, 1891, at Inch; very rare.

Black-throated Diver, *Colymbus arcticus*, Linn.—One obtained at Inch, November 7th, 1892.

Slavonian or Dusky Grebe, *Podiceps auritus*, Linn.—A few seen at Inch last winter.

In the same number is also recorded the Ruff, *Machetes pugnax*, Linn., of which three specimens have been obtained at Inch this year, two in September and one in October.—H. CHICHESTER HART (Carrablagh, Portsalon, Letterkenny).

Barn Owl breeding in Confinement.—A pair of Barn Owls, belonging to me, during the summer of 1892 laid four eggs in a barrel which I put up for them, and therein reared eight young ones. I imagine this is an unusual occurrence.—H. C. HEWITT (14, Park Street, Cambridge).

Velvet Scoter in West Suffolk.—On Nov. 26th an adult male Velvet Scoter, *Ædemia fusca*, was shot at Cockfield, near Bury St. Edmunds, where it had been noticed for two or three days before it was obtained. I saw it, in the flesh, at the birdstuffer's at Bury, and specially noticed the brilliancy of the orange and roseate colour of its feet and legs. Cockfield is quite twenty-five miles from the sea, and as Norfolk and Suffolk naturalists consider the Velvet Scoter essentially a marine duck, this occurrence seems worth recording. Even on the coast, an old male of this species is a rarity; the late Mr. Hele only had two brought to him at Aldeburgh during thirty years, one of which is preserved in his collection at the Ipswich Museum.—JULIAN G. TUCK (Tostock Rectory, Bury St. Edmunds).

Peahen assuming Male Plumage.—The occurrence of a male feathered Peahen (Zool. 1892, p. 429) is not without precedent, for I remember that there was one in a farmyard near Brandon; and Latham mentions two in his 'Synopsis of Birds' (vol. ii. p. 672). Some very curious hybrids, between fowls and Guinea-fowls, have been bred in Norfolk. My father had one, and I saw another in 1886; but I never heard of a hybrid Peahen.—J. H. GURNEY (Keswick, Norwich).

'The Zoologist' for December, 1892, contains a note on this subject (p. 429), concluding with the words:—"Such instances have often been noticed in the case of fowls, pheasants, and other birds, but never before in the case of the Pea-fowl." About 1885 or 1886 my lamented friend, and then rector, the Rev. S. H. Owen, of Bucknall, Staffs, had a Peahen which assumed the train and neck plumage of the male bird. I had no idea that such a circumstance was less usual than in other birds, or should have recorded it at the time. Both my wife and myself remember the bird well; and the "Peahen which turned into a Peacock" was quite a "household word."—JULIAN G. TUCK (Tostock Rectory, Bury St. Edmunds).

[We may add, also, the following extract from Bewick's 'British Birds,' in the article "Peacock":—"The females sometimes assume the plumage of the male; this is said to take place after they have done laying, A bird of this kind is preserved in the British Museum."—ED.]

The Spotted Crake in Scotland.—A specimen of this species was reported as captured near Moffat at the beginning of November. It is a bird of extremely secretive and skulking habits, and therefore it is generally supposed to be much rarer than it really is. Its nest has been found occasionally in Annandale, and the bird has been met with in that dale far oftener than in the other two Dumfriesshire dales. There are a few records for Galloway, to which I can now add another in an undoubted example of this species seen in a clover-field in the neighbourhood of Maxwelltown late in October last.—ROBERT SERVICE (Maxwelltown, Dumfries).

The Sheldrake in Captivity.—Can any reader of 'The Zoologist,' who is interested in ornamental waterfowl, tell me whether the following plan has ever been tried, by which tame Sheldrakes might be allowed to fly, without straying away? I propose next year, if I have any more young ones hatched out, as soon as they can fly, to clip the feathers of one wing, and to keep on clipping them as needed until the birds are paired. Then to pinion the duck, but to allow the drake to fly. I think the drake, once paired, would not desert the duck, and one might enjoy seeing him flying about without fear of his straying away. I am not sure whether these birds pair when two or not till three years old; in the latter case it would be rather a long time to wait. I write to enquire whether anyone has ever tried this plan, and if so, whether it has been successful or not. I may say that this year I had three Sheldrakes reared from the egg; one was killed by a fox, and the other two, as soon as they could fly well, finally went away altogether, as I believe they always do if left unpinioned.—H. C. HEWITT (14, Park Street, Cambridge).

Bitterns in Wilts.—Two specimens of the Common Bittern were shot in the meadows at Trafalgar in South Wilts, in February of last year, as I learnt by a letter from Lord Nelson, who kindly wrote to inform me of the fact; and, just a month before, I received a letter from Mr. Walter Bouverie, telling me that, to his regret, a Bittern was shot on his property at Little Cheverell in North Wilts, by a lad in his employ, on January 19th. Almost every year I receive tidings of one or more Bitterns having been killed in various parts of the county, and the colder the winter the greater is the number of Bitterns which visit us; for I take it for granted that though there may be, and have been, rare instances of this bird still breeding in England, the great majority of those seen in this and other counties are stragglers, which, driven by stress of weather from their own haunts,

have made the mistake of visiting this inhospitable country, where every strange bird, especially every large bird of handsome plumage, is ruthlessly done to death. Now if an inland county, like Wiltshire, has evidence of two or three Bitterns as annual visitors, it might be expected that in all the counties, collectively, fifty or sixty specimens are likely to occur; and, indeed, I have taken some pains to note in the columns of 'The Field,' 'The Zoologist,' and other publications, the number of Bitterns which, of late years, have been reported as occurring in various parts of England. I shall not be above the mark if I say that quite fifty specimens are recorded as an average every winter, though in some seasons very many more than in others; but I suppose that not one-half of those seen and killed amongst us are recorded in print, save, perhaps, in some country newspaper, where some of them may occupy a corner amongst other paragraphs, and are forgotten as soon as read. I would submit, then, that in all probability no less than one hundred of these beautiful birds come to us every winter, very few indeed of which, I fear, escape destruction. But whence do they come? Do they come from the marshy districts of Belgium and Western Germany, and especially from Holland? And do they come as single birds (accidental stragglers), or in small parties, or in flocks of forty or fifty, such as Captain Kelham once saw in Egypt in December (Zool. 1883, p. 223)? It would be of great interest to me, and doubtless to many others, if some light could be thrown on this little-known point by competent authority.—ALFRED CHAS. SMITH (Old Park, Devizes).

Notes from Heligoland.—The following are some of the exceptional occurrences on the Island in the summer and autumn of 1892. On July 14th, the first Spoonbill (an old female) ever seen there, was shot on Sandy Island by a bathing guest, who refused to part with it. On the 27th of the same month, *Alauda tartarica*, a beautiful and entirely black old male; it was stuffed and set up by Mr. Gätke himself; the only other record is one shot in April, 1874. On the 6th of October, *Anthus richardi* occurred. The Yellow-browed Warbler, recently recorded by Mr. Haigh on the Lincolnshire coast (Zool. xcii. p. 143), probably came across on the same day. These two occurrences are suggestive of an eastern movement. On the 21st, *Puffinus anglorum* was obtained; the first occurrence since fifty years ago, when the species was not unfrequent.—JOHN CORDEAUX (Eaton Hall, Retford).

Singular accident to a Greenfinch.—At a meeting of the Cambridge Entomological and Natural History Society, held during the past autumn session, Mr. Marriott exhibited a skull of a Greenfinch. He had observed the bird suspended to a telegraph wire near Cambridge, and not being able to make out how it was fixed, had with some difficulty taken it down. It

had apparently struck the wire in its flight, and the wire penetrating the frontal bone to the orbits, forcing out one eye and crushing the other. The broken frontal bone had served as a hook over the wire, and the bird was firmly suspended by its head.—WM. FARREN.

Proportion of Adult and Immature Birds amongst Accidental Visitors to the British Isles.—It has been frequently stated that much the largest proportion of rare and accidental wanderers on migration to the British Islands are birds of the year. Mr. Charles Dixon, in his recently published work on 'The Migration of Birds,' is the latest writer who has adopted this statement. He says (pp. 178-9): "The young birds are the greatest blunderers,—the birds that have practically no knowledge whatever of the road, and have to depend entirely on the guidance of older birds. That this is the case is abundantly proved by the fact that nearly all the birds that accidentally wander to the British Islands, from more or less remote countries, are birds of the year." I entirely dissent from Mr. Dixon's conclusion as to the incapacity of young birds in finding their route without guidance; but this is not now the question. Is it, or is it not, a fact that the large majority of accidental visitors are young birds? I am not aware that any English ornithologist has taken the trouble to collect statistics as to the proportion of adult and young. I question very much, however, whether these lost and gone-astray migrants do not bear much the same proportion as the common host of immigrants in the autumn, which is two adult to three young. From my own experience on the east coast, I should rather be inclined to regard adult and young as nearly equal amongst the rare and accidental occurrences from all lands. I have now before me a list, kindly prepared for me by Mr. Gätke, showing the proportions in Heligoland amongst the rare and exceptional visitors captured there during the last half-century. Of 133 exceptional occurrences, representing 20 species, whose home is Greece, Palestine, Southern Russia, Asia Minor, and Turkestan, with few exceptions, obtained from middle of May to end of July, 122 are adult and 11 young. Of species from as far as East Kamtschatka, arriving as a rule during September to end of November (buntings and thrushes), 34 are old and 13 young. Of American birds, 5 are old and 2 young. Of *Otocorys alpestris*, now a common autumn migrant, about two-thirds are old; of *Anthus richardi* and *Phylloscopus superciliosus*, about half are old. From this it will appear that the proportion of adults which go astray and reach Heligoland is very considerably in excess of the young. The list is instructive, as showing the number of individuals of each species, adults or young, and I therefore append it:—

"A. Birds from Greece, Asia Minor, Palestine, Southern Russia,

Tukestan, &c., almost without exception *old birds*; and, with a few exceptions, come here from middle of *May* to end of *July*. THIS IS A FIXED RULE:—*Sturnus roseus*, 70 old, 5 young; *Turdus saxatilis*, 5 old, 1 young; *Ruticilla mesoleuca*, 1 old, no young; *Acrocephalus agricola*, 1 old, no young; *Saxicola morio*, 2 old, no young; *S. aurita*, 2 old, no young; *S. deserti*, 2 old, 1 young; *Accentor alpinus*, 5 old, no young; *Alauda pispoletta*, 1 old, no young; *A. brachydactyla*, 30 old, 1 young; *A. leucopis*, 2 old, no young; *A. tartarica*, 2 old, no young; *Emberiza carsia*, 10 old, no young; *E. pityornis*, 1 old, no young; *E. pyrrhuloides*, 1 old, no young; *E. melanocephala*, 12 old, 1 young; *Hirundo rufula*, 1 old, no young; *Charadrius asiaticus*, 1 old, 1 young; *C. fulvus*, 2 old, 1 twelve months old, female; *Totanus stagnatilis*, 1 old, no young. All these, except the young birds, captured here from middle of *May* to near end of *July*; for dates, *vide* Vogelwarte.

B. Eastern species, as far as Kamtschatka, during September to end of November. ALSO FIXED RULE:—*Emberiza pusilla*, 16 old, 8 young; *E. rustica*, 8 old, 1 young; *E. aureola*, 1 old, 2 young; *Turdus varius*, 9 old, no young; *T. ruficollis*, no old, 1 young; *T. fuscatus*, no old, 1 young; *Alauda alpestris*, about $\frac{2}{3}$ old; *Anthus richardi*, about $\frac{1}{2}$ old; *Sylvia superciliosa*, about $\frac{1}{2}$ old; &c.

C. American birds:—*Anthus ludovicianus*, 2 old, no young; *Turdus lividus*, 1 old, no young; *Tringa rufescens*, 1 old, no young; *Larus rossi*, 1 old, no young; *L. sabinii*, no old, 2 young."

In 'The Zoologist,' 1892, p. 391, line 20, *dele* "an"; p. 420, line 21, for "as 100," read "in 100's".—JOHN CORDEAUX (Eaton Hall, Retford).

Ring Ouzel in Scotland in winter.—On Dec. 9th I was presented with a specimen of the Ring Ouzel, shot in an orchard not far from Dumfries. The Ring Ouzels all leave us just about the time that the last of the swallows go, and one individual staying so long at this period, when the winter weather is upon us in full force, is very remarkable. The circumstance is not, however, unprecedented in this part of Scotland, for at least two similar instances are known.—ROBERT SERVICE (Maxwelltown, Dumfries).

Supposed occurrence of *Loxia leucoptera* in Herts.—When out shooting with a friend on Jan. 11th, 1890, we got a bird which answers to Montagu's American White-winged Crossbill (*Loxia leucoptera*). After lunch we went into a little larch wood at the back of the keeper's cottage, when we saw the crossbill swinging underneath a branch near the top of one of the trees, and shot it, and did not notice any others. The stuffed bird is in my possession. Another uncommon bird in this neighbourhood, of which I have a specimen, is the Great Grey Shrike (*Lanius excubitor*),

shot here on Dec. 5th, 1890, as it was sitting on the top of a little oak tree in a hedgerow.—H. SOMERS RIVERS (Sawbridgeworth).

The Antarctic Sheathbill on the Coast of Ireland.—On December 3rd, 1892, I received from Mr. Richard Hamilton, Principal Keeper at the Carlingford Lighthouse, Co. Down, a letter dated the previous day, in which he wrote,—“ I am sending per parcel-post to-day a white bird, larger than a pigeon, I shot at lighthouse.” The bird duly arrived, and, having no good library at hand, it puzzled me completely. It was, however, recognised by my old friend Mr. A. G. More as the Sheathbill, *Chionis alba*, of the Falkland Islands and South Georgia. To set the matter satisfactorily at rest Professor Newton was consulted, and the description given by him proved that the identification was correct, and that it was not *C. minor* of Kerguelen-land and the Crozettes. On further enquiry Mr. Hamilton wrote again, on Dec. 9th, the following account:—“ I came off the lighthouse to-day, and send you all particulars about the bird. At 8.30 a.m., on the 2nd inst., I was at the Blockhouse (a small island about 800 yards from lighthouse), shooting duck, and saw the bird walking about on the highest part of it, which is not more than ten feet high. I first took it for a tame pigeon, as it seemed to take no notice of me, but observed that it walked differently, at about an angle of 45° , and was not pecking at anything; so I fired at it, and was surprised to see it go off. It took a half-circle from the rock, and again alighted a few yards from the water. I again fired at about forty yards; still the bird stood steady, as if not touched; so I sent the dog for it, and when about two yards distant it again took to flight, and seemed quite strong, but fell in the water about fifty yards from the rock. I picked it up with the boat. Mr. Jeffers, the assistant keeper, was looking on through a telescope from the lighthouse, and says that the flight of the bird resembled that of a Puffin, but the motion of the wing perhaps not so fast. It seemed quite at ease in the water, but when the boat approached it opened its wings as a land bird would do on the water.” On examining it the specimen proved to be very fat, and weighed 1 lb. 5 oz.; the sex female, with some small eggs like pin-heads in the ovary. There was no trace whatever of confinement on any part of the plumage; and Mr. Williams, who skinned and mounted it, is confident that the bird had not been in a cage for over four months at least,—possibly a longer period,—so perfect are all the feathers. Mr. Howard Saunders informs me that *Chionis alba* has been brought alive to Europe several times, and, were it not for its perfect plumage and condition, the specimen shot at Carlingford Lough might at once be placed among the “assisted immigrants.” It is scarcely credible that it can have traversed 7000 miles unaided; but whether it escaped from a passing

vessel many months ago, or came for a portion of the journey on a floating log, or by the sargasso seaweed, or solely by its own efforts, I must leave others to determine. The occurrence is remarkable, at any rate, of an almost antarctic species turning up at an Irish lighthouse, in excellent condition and without any apparent traces of previous confinement.—RICHARD M. BARRINGTON (Fassaroe Bray, Co. Wicklow).

[The appearance of this bird in a state of liberty upon the coast of Ireland is indeed remarkable, though perhaps not more so than the occurrence of a South Pacific Petrel, *Æstrelata torquata*, in Cardigan Bay (Zool. 1890, p. 454; Ibis, 1891, p. 411, with coloured figure). The Sheathbills, however, are apparently less wandering in their habits than some of the Petrels. There are only two species of the genus *Chionis*, namely *C. alba* and *C. minor*, and their distribution is somewhat curious, the former occupying islands off the southern portion of South America; the latter, islands southward of South Africa; and we are not aware of any record of the two species having been found together. If we are not mistaken, the example of *C. alba* now reported furnishes the first instance of the occurrence of either species in European waters. How far its passage may have been aided by man's intervention it is of course very difficult to determine.—ED.]

Bullfinches and Lilac Seeds.—Opposite my bed-room window, in my neighbour's small garden, nearly in the centre of this town, are some very large lilac shrubs, in fact they might almost be called trees. For some mornings lately I have noticed, when dressing, several Bullfinches, *Pyrrhula europæa*, busily engaged feeding on the lilac seeds. This morning I saw no less than seven of these birds so employed. Others may have noticed the fact that these seeds are a favourite food of the Bullfinch; but it is a new and interesting one to me, and may be to others besides myself, and for this reason I have thought it worth recording. The flavour of the lilac has always appeared to me so disagreeable that I thought no birds would touch the seeds, and these are the only ones I have ever seen interfering with them.—HENRY LAVER (Colchester).

Bittern in Dorset.—On the 8th of December last a specimen of this now uncommon British bird was shot in this neighbourhood.—W. D. SLADE (Burton Branstock, Dorset).

Little Grebe killed by Telegraph-Wires.—During the first week in December, Mr. John Little, one of the pointsmen at Maxwelltown Station, brought me a Little Grebe which had been killed by coming in contact with the telegraph-wires; and this seems to be a bird which somehow eludes the wires in its flights, for I cannot find that it has been noted before as

one of those liable to get killed in this way.—ROBERT SERVICE (Maxwelltown, Dumfries).

Quail in Winter in South Hants.—A Quail was brought to me on December 12th by a man whose dog had just caught it. The bird was a male, and in good condition. On referring to my notes I see that I flushed one on Dec. 31st, 1889, near the same spot where this one was caught.—J. STARES (Portchester).

Wagtail's Nest in November.—The following paragraph appeared in the 'Birmingham Daily Mail' of Nov. 16th:—"On Monday [Nov. 14] a singular discovery was made in Wolverton Works by one of the firemen, named Pakes. Pakes, while engaged in shunting, observed a Water Wagtail fly from under a truck, and a search made under the coach revealed the existence of a bird's nest located between the axle-box and the axle-guard. The nest contained two eggs, one quite warm, having been recently laid." I presume the bird was a Pied Wagtail, and that the truck had been disused for a long time; but the situation of the nest is of minor importance when compared with the statement that *the eggs had been recently laid*. Not feeling satisfied on this point, I wrote to a gentleman in the neighbourhood for further information, and he has replied:—"I have made enquiries into this case, and find the eggs in the nest in question were quite fresh." Assuming that no mistake has been made, is it not a record to find such a nest with fresh eggs in the month of November? I have suggested that the nest and eggs should be preserved.—A. H. ETCHES (Birmingham).

[Some years ago a similar case occurred in Sussex—if we remember right, at Littlehampton. The nest was that of the Pied Wagtail, and, being similarly placed under a railway carriage, the sitting bird made a daily journey to and fro of several miles. It was reported at the time in the 'West Sussex Gazette,' and copied by other papers. In the 'Zoologist' for 1885 (p. 420) an account is given of a pair of Pied Wagtails which built their nest in a stack of coal, on a wharf at Leicester,—a sufficiently unusual position to attract notice, for in this case instinct seemed to be at fault, and the natural surroundings of the nest could hardly be said to favour concealment.—ED.]

REPTILIA.

Venom in Harmless Snakes.—Two definite cases of the venomous action of the secretions of harmless snakes seem to be worthy of mention. In the one case, it is a matter of my own experience, in which I was bitten on the first finger by a large freshly-caught specimen of the common red, white and black-banded Coral Snake, *Erythrolanprus venustissimus*, which happened to grasp my first finger in such a way as to drive its hinder grooved teeth, forcing them about three times deep down into the flesh,

the anterior teeth causing but minute punctures. Knowing the general harmlessness of the snake, I paid no attention to the bite beyond wiping the blood away—although it smarted rather sharply—until, about half-an-hour after, the finger became much swollen at the place and distinctly very painful, much more so than I was prepared for from the mere fact of the wound, and rather as if it had been stung by some of the larger wasps. The swelling became no greater, but the pain increased, and was only lessened by the application of ammonia, and it was not till about four hours afterwards that real relief was obtained, though the place was tender for a much longer time. In the other case, the experience was that of the clerk in the Museum, who was bitten on the finger by a young specimen of the common Frog or Mattipi Snake, *Xenodon severus*, whose hinder enlarged movable teeth were driven deeply into the flesh, with a result similar to that described in the case of the other snake. Frequently, in handling these little harmless snakes, one may receive a bite or nip from them, but it is seldom, under the circumstances, that they have the chance of driving in their specialized hinder maxillary teeth; and the foregoing instances, in which this took place, are simply mentioned because a similar painful result has never been noticed when the bite has been given by the small anterior teeth. There can be no question, in these cases, of a bad state of health; nor, considering the amount and degree of pain and swelling, can the result be ascribed to the mere laceration produced. The whole effect seemed to me to be due to the fact that, in these two instances, the small snakes were able to grasp, with their large specialised teeth, the small parts of the fingers, just as they would grasp the small animals on which they prey; and the effect produced in the small animals would be such as no doubt to cause temporary paralysis or unconsciousness, the better to enable the snake to swallow them—just as in the case of so many of the Hymenoptera and other such forms, the sting, which is only painful and local in man and other large animals is sufficient to paralyse, if not kill, the small insects which they secure as food in their nests for their young, and which they are thus enabled to manipulate without trouble. That the peculiarly painful result was caused by a specialised secretion, seems to me to be the only sane conclusion in these cases; and the fact of the teeth being grooved—in one case at least—tends to confirm this. That the glandular structures at the base of, and around, the specialised teeth secrete some specially acrid fluid or poison, which bathes the tooth and becomes carried into the wound by the teeth, seems to me to be no more strange than that a very similar thing should occur in the well-known cases of the various stinging Rays, where the spines, even in the water, are thus rendered highly offensive and defensive organs.—J. J. QUELCH (Georgetown, British Guiana).

SCIENTIFIC SOCIETIES.

LINNEAN SOCIETY OF LONDON.

December 1, 1892.—Prof. STEWART, President, in the chair.

Messrs. A. P. Green, A. B. Morris, A. F. Kent, H. W. Monckton, and F. G. Parsons were elected Fellows.

A letter was read from the Rev. Leonard Blomefield, M.A., F.L.S., expressing his high appreciation of the compliment paid him by the presentation of the illuminated address which had been signed by the Fellows present at the last meeting of the Society, and forwarded to him.

Messrs. H. and J. Groves exhibited specimens of several Irish *Characeæ* collected during the past summer. *Nitella tenuissima*, from Westmeath and Galway, had not been previously recorded from Ireland, and a large form of *N. gracilis*, from two lakes in Wicklow, had been only once previously met with. Referring to the former, Mr. H. Groves remarked that, although it might be expected to occur in all the peat districts, it had only been found in two widely-separated localities in England—namely, in the Cambridgeshire Fens and in Anglesea.

Mr. A. Lister made some remarks on the Nuclei of *Mycetozoa*, exhibiting some preparations under the microscope.

Mr. E. Cambridge Phillips forwarded for exhibition a hybrid between Red and Black Grouse which had been shot in August near Brecon.

Mr. J. E. Harting exhibited and made remarks on some coleopterous larvæ which had been vomited by a child at Tintern, and had been forwarded by the medical attendant, Dr. J. Taylor Brown, for identification. The precise species had not been determined, but was considered to be allied to *Blaps mortisaga*. Mr. Harting drew attention to the fact that cases of voiding coleopterous larvæ were mentioned by Kirby and Spence (7th ed. p. 71), and by the late Dr. Spencer Cobbold, in his work on Parasites (1879, p. 269).

Mr. D. Morris exhibited some tubers of *Calathia allonia*, eaten as potatoes in Trinidad, where it is known as Tapa Nambour.

A communication was read from Mr. J. H. Hart, of the Botanic Gardens, Trinidad, on *Æcodoma cephalotes* and the Fungi it cultivates.

Prof F. Jeffery Bell contributed a short paper on a small collection of Crinoids from the Sahul Bank, North Australia, some of which were new; and Mr. Edgar Smith communicated descriptions of some new Land Shells from Borneo.

The meeting adjourned to December 15th.

December 15.—Prof. STEWART, President, in the chair.

Messrs. L. A. Bernays, G. Gray, and W. Whitewell were elected, and Messrs. W. Stanley Kent, H. W. Monckton, and F. G. Parsons were admitted Fellows of the Society.

The President announced the recent death of Mr. H. T. Stainton, a Fellow and former Vice-President of the Society, and of European reputation amongst entomologists, by whom his loss will be widely felt.

Mr. D. Morries exhibited a series of botanical photographs from the West Coast of Africa, and gave some interesting details about the appearance and mode of growth of some of the more remarkable forest trees and plants of that region.

The Secretary exhibited a large collection of photographs of Lichens, very neatly mounted and labelled, which had been recently presented to the Society by Prof. Arnold, of Munich.

On behalf of Mr. George Swainson, of St. Anne's-on-Sea, Lancashire, Mr. A. R. Hammond exhibited an aquatic dipterous larva, belonging probably to the genus *Disca*, of which, by means of the oxy-hydrogen lantern, with microscopic attachment, a good figure was projected on the screen. He referred to the different views which prevailed concerning the dorsal and ventral aspects of this larva, and pointed out that the tail-plates possessed features which in allied forms were characteristic not so much of the larval as of the pupal stage.

A paper was then read by Dr. Maxwell T. Masters, F.R.S., on the classification and geographical distribution of the *Taxaceæ* and *Coniferæ*, his remarks being illustrated by a specially prepared map lent by Mr. C. B. Clarke, and by specimens of the fruit and leaves of some of the more notable forms.

Mr. George Brook followed with a paper on the affinities of *Madrepora*, and here again, by means of the oxy-hydrogen lantern, an excellent series of coral section was projected, which illustrated very clearly the author's remarks on comparative structure.

A short note on the abnormal form of the lens in the eyes of an albino Rat, by Prof. R. J. Anderson, was read, on his behalf, by the Secretary.

The meeting then adjourned to the 19th Jan. 1893.

ZOOLOGICAL SOCIETY OF LONDON.

December 6, 1892.—Dr. ST. GEORGE MIVART, F.R.S., Vice-President, in the chair.

The Secretary read a report on the additions that had been made to the Society's Menagerie during the month of November, 1892.

Dr. Hickson read a paper entitled "A Revision of the Genera of the *Alyonaria Stolonifera*, with a description of one new genus and several

new species." The author commenced by stating the grounds upon which it might be considered desirable to retain the suborder Stolonifera, and criticised the views of those who place these Alcyonarians in the suborder Alcyonida. Of the genera that had already been proposed only four could now be retained, namely, *Tubipora*, *Clavularia*, *Cornularia*, and *Sympodium*, and the author proposed to add one more, namely, *Stereosoma*. The genera *Sarcodictyon*, *Rhizoxenia*, *Cornulariella*, *Anthelia*, and *Gymnosarca* must be abandoned, and the species incorporated in the other genera. A description was then given of the new genus *Stereosoma*, a form found on the coast of North Celebes, distinguished from all other Stolonifera by certain characters of its tentacles and by the absolute non-retractability of its polypes. Several new species of *Clavularia* were then described from North Celebes, Diego Garcia, and Australia. This was followed by a summary of all the species of the genus known to science.

Mr. F. E. Beddard read a description of the convolutions of the cerebral hemispheres in certain rodents. The paper referred chiefly to *Dasyprocta*, *Celogenys*, *Lagostomus*, *Hydrochærus*, and *Dolichotis*, being the genera of rodents in which the brains show the greatest development of convolutions.

A communication was read from Prof. Collett, containing a description of a new Monkey from S.E. Sumatra, for which he proposed the name *Semnopithecus thomasi*.

Mr. H. J. Elwes read the second portion of an account of the Butterflies collected by Mr. W. Doherty in the Naga and Karen Hills and in Perak.—
P. L. SCLATER, *Secretary*.

December 20.—OSBERT SALVIN, Esq., F.R.S., Vice-President, in the chair.

A letter was read from Dr. A. B. Meyer, of Dresden, respecting the occurrence of a Monkey, *Semnopithecus nemæus*, in Hainan.

A communication was read from the Rev. T. R. R. Stebbing, entitled "Descriptions of nine new Species of Amphipodous Crustaceans from the Tropical Atlantic." This communication contained descriptions and figures of some new Hyperidean Amphipoda collected by Mr. John Rattray, when on board the 'Buccaneer' at the beginning of 1886. The specimens had been taken in the tropical Atlantic off the west coast of Africa by a series of "tow-nettings" carried on at the expense of Dr. John Murray and Mr. J. Y. Buchanan.

Dr. Hans Gadow gave an account of the remains of some gigantic Land Tortoises and of *Didosaurus* recently discovered in Mauritius, along with the bones of the Dodo described in a previous communication by Sir Edward Newton and himself. The remains of the Tortoises were referred to *Testudo indica*, *T. triserrata*, *T. inepta*, and to two new forms proposed to be called *T. sauzieri* and *T. soumeirei*, the latter being possibly related to the gigantic

Tortoises of Aldabra. Along with these Tortoises were found numerous bones of the extinct Lizard, *Didosaurus mauritanus*, of which an account is also given.

Mr. F. E. Beddard gave descriptions of some new species of Earth-worms from various localities, belonging to the genera *Octochætus*, *Acanthodrilus*, *Benhamia*, *Microdrilus*, *Perionyx*, *Moniligaster*, *Notykus*, *Tricochæta*, and *Ilyogenia*. Of these nine genera *Octochætus*, *Microdrilus*, and *Ilyogenia* were characterised as new to science.

Mr. R. H. Burne read a note on the presence in the Common Hag, *Myxine glutinosa*, of a branchial basket, which had not been previously recognised in this fish, though already described in the larger Hag, *M. bdellostoma*.—P. L. SCLATER, *Secretary*.

ENTOMOLOGICAL SOCIETY OF LONDON.

December 7, 1892. — FREDERICK DUCANE GODMAN, Esq., F.R.S., President, in the chair.

The President announced the death, on the 2nd December, of Mr. Henry T. Stainton, F.R.S., an ex-President of the Society. A vote of condolence with Mrs. Stainton was passed by the meeting.

Mr. Frank Bouskell, of 11, Lansdowne Road, Stonegate, Leicester; Mr. George C. Dennis, of Tower Street, York; Mr. Charles B. Headley, of Stonegate Road, Leicester; Mr. William Mansbridge, of Luther Place, Horsforth, near Leeds; and the Rev. George W. Taylor, of St. Barnabas, Victoria, British Columbia, were elected Fellows of the Society.

Mr. Jenner Weir exhibited a species of *Acræa* from Sierra Leone, which Mr. Roland Trimen, who had examined the specimen, considered to be a remarkable variety of *Telchinia encedon*, Linn. It was a very close mimic of *Limnas alcippus*, the usual Western African form of *Limnas chrysippus*. The upper wings of the specimen were rufous and the lower white, as in the model, and the resemblance in other respects was heightened by the almost total suppression of the black spots in the disc of the upper wings, characteristic of the usual markings of *T. encedon*.

Mr. F. J. Hanbury exhibited a remarkable variety of *Lycæna adonis*, caught in Kent this year, with only one large spot on the under side of each upper wing, and the spots on the lower wings entirely replaced by suffused white patches. He also exhibited two specimens of *Noctua xanthographa* of a remarkably pale brownish grey colour, approaching a dirty white, obtained in Essex in 1891; and a variety of *Acronycta rumicis*, also taken in Essex, with a beautiful dark hind margin to the fore wings.

Mr. H. J. Elwes exhibited a living specimen of a species of *Conocephalus*, a genus of *Locustidæ*, several species of which, Mr. C. O. Waterhouse and Mr. McLachlan stated, had been found alive in hothouses in this country.

Dr. T. A. Chapman exhibited immature specimens of *Tæniocampa gracilis*, *T. gothica*, *T. populeti*, *T. munda*, *T. instabilis*, and *T. leucographa*, which had been taken out of their cocoons in the autumn, with the object of showing the then state of development of the imagos.

Mr. F. W. Frohawk exhibited a living specimen of the larva of *Carterocephalus palæmon* (*Hesperia paniscus*), hybernating on a species of grass which he believed to be *Bromus asper*. The Rev. Canon Fowler and Mr. H. Goss expressed their interest at seeing the larva of this local species, the imagos of which they had respectively collected in certain woods in Lincolnshire and Northamptonshire. Mr. Goss stated that the food-plants of the species were supposed to be *Plantago major* and *Cynosurus cristatus*, but that the larva might possibly feed on *Bromus asper*.

Mr. C. G. Barrett exhibited a long series of remarkable melanic and other varieties of *Boarmia repandata*, bred by Mr. A. E. Hall from larvæ collected near Sheffield.

Mr. W. Farren exhibited, and commented on, four varieties of *Papilio machaon* from Wicken Fen; also a series of two or three species of *Nepticula* pinned on pith with the "minutien Nadeln," for the purpose of showing these pins.

Canon Fowler exhibited specimens of *Xyleborus perforans*, Woll., which had been devastating the sugar-canes in the West Indies. Mr. C. O. Waterhouse stated that the larvæ had done great damage to beer-casks in India.

Mr. E. B. Poulton showed, by means of the oxy-hydrogen lantern, a number of slides of various larvæ and pupæ, in illustration of his paper, read at the October meeting, entitled "Further experiments upon the colour-relation between certain lepidopterous larvæ and their surroundings." He stated that he believed that nineteen out of twenty larvæ of *Geometridæ* possessed the power of colour adjustment. Mr. F. Merrifield, the Rev. J. Seymour St. John, and Mr. Jacoby took part in the discussion which ensued.

Mr. F. Merrifield read a paper entitled "The effects of temperature on the colouring of *Pieris napi*, *Vanessa atalanta*, *Chrysophanus phlæas*, and *Ephyra punctata*," and exhibited many specimens thus affected. In the cases of *P. napi*, *C. phlæas*, and *E. punctata*, he remarked that they corresponded with natural variations of these species in regions or seasons associated with similar temperatures; and some curious effects produced by severe temperatures on *V. atalanta* seemed likely to throw light on the evolution of the complex markings of the Vanessas. Mr. Poulton, Dr. F. A. Dixey, Mr. Elwes, Mr. Jenner Weir, Mr. Tutt, and Mr. Frohawk took part in the discussion which ensued.

Mr. Kenneth J. Morton communicated a paper entitled, "Notes on *Hydroptilidæ* belonging to the European Fauna, with descriptions of new

species." Mr. McLachlan made some remarks on the subject of this paper.

Dr. T. Algernon Chapman read a paper entitled "On some neglected points in the structure of the pupa of Heterocerous Lepidoptera, and their probable value in classification; with some associated observations on larval prolegs." Mr. Poulton, Mr. Tutt, Mr. Hampson, and Mr. Gahan took part in the discussion which ensued.

Mr. J. Cosmo-Melvill communicated a paper entitled "Description of a new species of Butterfly of the genus *Calinaga*, from Siam."

Mr. W. L. Distant communicated a paper entitled "Descriptions of new genera and species of Neotropical *Rhynchota*."—H. Goss and W. W. FOWLER, *Hon. Secretaries*.

NOTICES OF NEW BOOKS.

Text-Book of the Embryology of Man and Mammals. By Dr. OSCAR HARTWIG, Professor Extraordinarius of Anatomy and Comparative Anatomy, University of Berlin. Translated from the Third German Edition by Edward L. Mark, Ph.D., Hussey Professor of Anatomy, Harvard University. 8vo. London: Swan Sonnenschein & Co. New York: Macmillan and Co. 1892.

THIS work of 656 pp. is a translation of a volume which has already proved a boon to entomologists in all parts of the world. The main bulk of it is divided into seventeen chapters, one of which is devoted to a "general discussion of the principles of development." The author's name and brilliant reputation are in themselves a guarantee of success, and his volume is already so well known and generally in demand, that detailed criticism of the original would be here superfluous. Among the more wholesome features of the work are the incorporation of a recurring series of concise summaries, and the adequate "presentation of unsettled questions," the matters falling under this or that head being brought to a focus in such a way that the reader at once realises what is the sum of current knowledge reported, and what the field for future enquiry.

The illustrations, though accurate, are to a large extent poorly executed; and many of them appear to have been either printed from worn electros, or to have suffered in the manipu-

lation. So fully is this the case with figs. 87 and 121 that it is difficult to believe them to be representations of the same thing. And, by way of a small detail, there is something particularly gruesome in the style in which figures such as 338 and 339 are rendered. The author has availed himself of many familiar and highly characteristic illustrations—notably those of Iris, so well known; but certain time-honoured diagrams which are met with everywhere, might with advantage be replaced—notably those of Rathke, which depict the metamorphoses of the aortic arches. Although the work is professedly devoted to “Man and Mammals,” it is in reality of a more comprehensive character, as is proved by the method of treatment and the lists of literature cited. All the more reason, therefore, that the said diagrams should have given way to the more recent and accurate ones of Boas; and that at least direct allusion should have been made to Zimmermann’s alleged discovery of the fifth or pre-pulmonary arch in the rabbit.

The translation, as a piece of literary work, is well done; but we nevertheless deprecate the employment throughout of the words “outer,” “inner,” and “middle,” “germ layers,” instead of their conventional English equivalents. The translator remarks in his preface (which we note, incidentally, does not bear a date) that he has called “the reader’s attention to some . . . topics in which the most important advances have been made during the interval of translation,” but comparison with the original shows him to have but feebly carried this into effect. The non-incorporation of, for example, the works of Duval, Hubrecht, and Stahl, on the placenta; of Mitsukwi, on the embryonic envelopes and germinal layers of the Chelonia; are, under the circumstances, inexplicable. There is something incongruous in the fact that the translator, who has failed to carry this resolve into effect, should be he who has stimulated his pupils and co-workers to the production of those exhaustive *résumés* of progressive research which constitute a unique feature of the ‘Bulletins of the Museum of Comparative Zoology’ with which his name is so honourably associated. More wonder then that the cover of the book should bear the gilded names of the author and translator hyphenated into one, in accordance with the unjust and misleading principle adopted by the publishers for the series of Science Manuals to which this one belongs.

As a translation of the original into English the book is, on the whole, an excellent one; but the reader who can command the German tongue has little to gain by its adoption.

G. B. H.

The Life of a Foxhound. By JOHN MILLS. Third Edition. Illustrated. 8vo, pp. 222. London: Simpkin, Marshall & Co. 1892.

It is hardly necessary to say more about this well-known work than that it has given pleasure to a past generation of lovers of country life and sport, and will, in its present form, delight those of our younger readers who do not remember the original publication.

Delagoa Bay: its Natives and Natural History. By ROSE MONTEIRO. Sm. 8vo, pp. 274. London: George Philip & Son. 1891.

ON its own merits this little book deserves perusal by everyone who is imbued with a genuine love of nature, but it possesses an additional interest from the antecedents of its author, and the conditions under which it was written. Many of our older readers will remember Joachim John Monteiro, an Englishman in the best sense of the word, but of Portuguese extraction, who devoted some of the best years of his life to the exploration of Western Africa, and whose work upon Angola, published in 1875, is still, we believe, the standard book of reference for that important province. The information then conveyed respecting the lower waters of the Congo was considered, at the time, to be of great importance, although, of course, superseded by the subsequent explorations of Stanley and others. In 1876, accompanied by his wife, the author of the present work, he went to Delagoa Bay on the east coast with the express object of working out the natural history of the Portuguese possessions on that side of Africa, and there he died.

Mrs. Monteiro returned to England in 1878, but after a short stay in this country she decided, in spite of painful associations, to revisit the town of Lourenço Marques, and resume her former occupation of collecting insects, principally butterflies. In a month's time she found herself fairly settled in her cottage on a bluff overlooking "the finest natural harbour in South Africa;"

and the accounts of her daily life there, her trials with the native servants, her success in training indolent Kafirs to assist in collecting specimens, and the details respecting the animals met with during her rambles, are narrated with a cheerfulness—and at the same time with a sense of humour—which makes her book delightful reading. Birds are by no means neglected, as will be seen on reference to pp. 39–53, and indeed some of her feathered friends, though adding to the enjoyment of the author, proved to be rather serious rivals in the business of collecting insects, especially a beautiful species of Coly of a rich rufous brown, with two long tail-feathers and a black crest, which abounded in the woods. “Many a time,” says Mrs. Monteiro, “have I seen one chasing a butterfly I particularly coveted, which sometimes fell to the bird’s share and sometimes to mine. I shall never forget the cry of horror my boy gave, nor his look of consternation, when one of these birds darted out and captured a rare butterfly he had been endeavouring to net for more than an hour, whilst patiently seated in a most uncomfortable position on the top of a tree.” Swallows (belonging to our own familiar species) were abundant at Delagoa Bay; and early in March, after torrential rain and a hurricane of wind which sent the thermometer down to 63°, numbers took refuge in Mrs. Monteiro’s house, where they seemed to like the warmth of her hand, and did not attempt to move when she stroked their heads.

Insects, naturally, attracted the largest share of the author’s attention, and many of these, with the flowers and plants on which they feed, form the subjects of the beautiful and artistic illustrations at the head of each chapter. These are by A. B. and E. C. Woodward, from original sketches by the author. Several butterflies new to the African fauna are figured, and brief descriptions are given of the larvæ of many species of Lepidoptera, some of them for the first time. Mrs. Monteiro engages in an able defence of the flowers of South Africa against the often-repeated accusation that they are devoid of scent; she asserts that the Delagoa Bay fever is not nearly so black as it is painted; she has even a good word for the Kafir; and altogether she may be congratulated upon having written a thoroughly cheerful and interesting book.

THE ZOOLOGIST.

THIRD SERIES.

VOL. XVII.]

FEBRUARY, 1893.

[No. 194.]

OCCURRENCE OF SOWERBY'S WHALE (*MESOPLODON BIDENS*) ON THE NORFOLK COAST.

BY THOMAS SOUTHWELL, F.Z.S.

ON the 19th December, 1892, I received a telegram stating that a strange fish was ashore at Overstrand, near Cromer, and subsequently that it was some species of whale; on the 20th, in company with Mr. S. F. Harmer, of the Museum of Zoology and Anatomy, Cambridge, who happened to be staying in this neighbourhood, I went to Overstrand, where we found an adult female of the above rare species.

Its history, we learned, was as follows:—At about 8 a.m. on Sunday, the 18th December, one of the Overstrand fishermen saw from the cliff an object lying in shallow water near the beach, which he at first took to be a log of wood, but soon perceived to be a large “fish.” After obtaining assistance, he fastened a noose over its tail and secured it by an anchor, till it was placed on a trolley and drawn up the gangway to a shed on the cliff where we saw it. The animal was alive when first observed, but died before it was taken from the water. As placed, it was unfortunately in such a position as to render photographing difficult, and our attempts proved unsatisfactory. I believe no photograph was taken after it had been removed from the shed. Before our arrival it had been eviscerated, and a very advanced foetus was taken from it. We made a very careful examination of the exterior, and hope to publish a full description both of the old female and of the young one in due course.

In the meantime I may say that the female was of an uniform glossy black colour, with the exception of the anterior edges of the flukes of the tail, and the jaws, which were grey of various shades—in places almost white, and the body was spotted and blotched with white or pale grey in a very curious manner. The fishermen told us that, when quite fresh out of the water, there was a bluish shade pervading the whole. The young animal was black above and reddish on the sides and lower parts, probably owing to the effusion of blood into the skin, which would doubtless otherwise have been white. The total length of the old female, measured in a straight line to the centre of the tail, was 16 ft. 2 in., and that of the young one 5 ft. 2 in.; across the flukes of the tail the adult measured 3 ft. 8 in.

The present is the nineteenth known example of this remarkable animal, all of which have been met with in the North Atlantic during the present century; but, with the exception of one taken in 1889 at Atlantic City, which came into the possession of the United States National Museum at Washington, and of which no account has, I believe, at present been published, in no other instance has an example in perfect condition come under the notice of a cetologist. Individuals or their remains have been found in Scotland and Ireland, but the only previous English example was met with at the mouth of the Humber in September, 1885 (*Ann. & Mag. N. H.* 1886, p. 53).

ANIMAL LIFE IN EAST GREENLAND.

By COLONEL H. W. FEILDEN, C.M.Z.S.

It is extremely interesting to note how, year by year, our knowledge of the distribution of animal life around the great ice-clad island-continent of Greenland is developing. In 'The Zoologist' for 1890 (p. 178), I drew attention to the finding of Musk-oxen in considerable numbers on Clavering Island in 74° 20' N., by Captain Knüdsen, of the Norwegian sealer 'Heckla.' In the 'Geographical Journal' for January, 1893, Lieutenant Ryder, of the Danish Navy, gives an interesting summary of his East Greenland Expedition, 1891-92, and at page 45 he records, "Animal life is rich, especially in Jameson's Land, where Reindeer are seen in wonderful numbers. They

also are numerous on the coasts of the interior fjords. Musk-oxen were seen around Hurry Inlet, and traces of Foxes, Hares, Bears, Ermines, and Lemmings were observed in Jameson's Land. The richness of vegetation (150 flowering plants were gathered in Scoresby Sound), and the size attained by it, especially around the western basin, is most astonishing, especially in comparison with what it is on the western coast, or a little further north where the snowfall is smaller."

The southern range of the Musk-ox is now satisfactorily established as far south on the east coast of Greenland as midway between the parallels of seventy and seventy-one; it will in all probability be found in the future to extend along the coast line of Egede Land to the sixty-fifth parallel of latitude. Thus we find that the habitat of the Musk-ox is brought comparatively close to Europe, and I see no insuperable difficulty in the way of procuring living specimens of these most interesting animals. As far back as the year 1879, I pointed out, in 'The Zoologist' (p. 17), what a valuable accession to our fauna the Musk-ox would prove, if it could be introduced successfully into Great Britain. I see no reason why it should not thrive on the mountains of the Highlands of Scotland.

In the winter season the Musk-ox is covered with a long-stapled fine wool in addition to its coat of hair. This wool is of a light yellow colour, and as fine as silk. Sir John Richardson states that stockings made from this wool were more beautiful than silk ones. Young Musk-oxen are very easily reared and tamed, and there could not be any great difficulty in catching either old or young in Jameson's Land. The risks incident to their transport from East Greenland to Europe are small, and the subject is well worth the consideration of the Council of our Zoological Society.

To my mind the most interesting feature in connection with the terrestrial mammalian life of the great island-continent, extending from 60° to $83^{\circ} 24'$ N., a distance of fifteen hundred miles, rests in the fact that throughout the entire stretch of its coast line, so far as it has been explored, except where glaciers or the ice-cap meet the sea, the fringe of non-glaciated shore, extending for thousands of miles, supports terrestrial mammalian life and phanerogamic vegetation. In favoured localities, even a remarkable number of large mammals find the means of existence.

Therefore in the northern hemisphere we see an island-continent, with its southern extremity in the same parallel as the Shetlands, Bergen, Christiania, and St. Petersburg, remaining under the most stupendous process of glaciation, extending fifteen hundred miles further towards the Pole, and yet the glaciation of Cape Farewell, its southern extremity, is as complete as at its northern apex, between the eighty-third and eighty-fourth parallels of latitude.

This astonishing development of glaciation we know to be due to the encircling of Greenland by cold arctic currents, and not to its geographical position alone. Are the advocates of glacial epochs prepared to prove that the glaciation of Scotland, England, Iceland, the Faroes, and Norway was ever more complete or excessive than that now existing in Greenland?

Until this is proved, I think we as zoologists should, with the knowledge we possess of terrestrial animal life in Greenland, be extremely cautious in supposing that even during the period of greatest ascendancy of the glacial epoch in the northern hemisphere, the terrestrial fauna and flora, of those regions possessed of a sea coast, were entirely removed by glaciation of the land surfaces, for in glaciated Greenland we find a considerable terrestrial mammalian fauna inhabiting its entire extent of shore.

NOTES ON THE BIRDS OF NORTH-WESTERN CANADA.

By D. L. THORPE.

Communicated by the Rev. H. A. MACPHERSON.

[THIS paper, draughted from the notes and letters of Mr. Thorpe, supplies the gist of his observations on a visit to the North-West in 1891. Mr. Thorpe left England on the 8th May, and reached his headquarters at Dalesbro' about the end of the month. Dalesbro' is situated some 400 miles south-west of the city of Winnipeg. Thanks to the kindness of my friend Mr. Miller Christy, in furnishing an introduction to Mr. Ernest Thompson, of Toronto, Mr. Thorpe found full instructions for his work awaiting him at Dalesbro'. Unfortunately, Mr. Thorpe sacrificed much valuable time in assisting his hosts in their farming operations, his good nature succumbing to their pressing

importunity and determination to make the most of a handy guest; so that he was induced to linger through June and July at Dalesbro', devoting only a portion of his time to scientific work. Dalesbro' is surrounded by an endless succession of rolling prairies, redeemed from utter sterility by a plentiful growth of coarse grasses, which attain their greatest profusion on the banks of the sloughs. These sloughs or ponds are generally fringed with a small species of poplar, which would doubtless assume more pretentious dimensions were it not for the frequent recurrence of prairie fires. On the 17th day of August, 1891, Mr. Thorpe left Dalesbro' for the Souris River, accompanied by a "hired man," a young Englishman named Holmes, who proved to be an excellent fellow, and made himself extremely useful.

When the Souris coal-fields were reached, the landscape became picturesque and varied; coal fires—and subsidences due to such fires—having here transformed the crust of the prairie into a region of large ravines and intervening table-lands. After leaving the Souris coal-fields, the party followed the trail to a police settlement called Wood End, where alkaline sloughs and creeks became numerous, while extensive morasses surrounded lakes of considerable size. Many of Mr. Thorpe's most interesting notes were made here, on the shores of a lake which is represented on our chart, but without a name being assigned: for purposes of convenience, I have entitled it the "Nameless Lake" in this paper.

Mr. Thorpe returned to Dalesbro' on Sept. 27th, and remained there until the beginning of December. He proposes to return to the North-West for collecting purposes early in the spring of 1893. Cordial thanks for assistance rendered are due to Mr. Ernest E. Thompson, whose 'Birds of Manitoba' has proved of great assistance, and the arrangement and nomenclature of his book are chiefly adopted in this paper.—H. A. MACPHERSON.]

AMERICAN EARED GREBE, *Colymbus nigricollis californicus*.—This species was numerous in autumn on the Nameless Lake, and both young and mature specimens were shot. The gizzard of one of these contained two small fishes entire.

PIED-BILLED GREBE, *Podilymbus podiceps*.—The only example met with was killed with a rifle on Long Creek. Though shot

through the head, it was quite lively an hour after receiving the injury.

LOON, *Urinator imber*.—A solitary Great Northern Diver appeared one evening early in September on the Nameless Lake, and there remained, swimming cautiously in the centre of the water.

BLACK TERN, *Hydrochelidon nigra surinamensis*.—Many pairs of Black Terns breed at Moose Creek, where dragon-flies form a large portion of their dietary; but the birds were often to be seen diving into the water in pursuit of fish or of aquatic larvæ. Their cry is a short scream, repeated again and again if the birds are alarmed by an intruder. About the beginning of August these Terns began to skim around the prairie sloughs. The last that I saw of them was on the 29th of August, the majority having commenced migration prior to that date.

DOUBLE-CRESTED CORMORANT, *Phalacrocorax dilophus*.—The only Cormorant that I fell in with was shot on a creek eighty miles west of the Souris coal-fields. I saw it alight on a distant pool made by a beaver's dam, and, after two unsuccessful shots, bagged the bird as it emerged after a long dive.

AMERICAN WHITE PELICAN, *Pelecanus erythrorhynchos*.—Great numbers of Pelicans frequented the Nameless Lake; others were met with on the Souris River and on Moose Creek. There were many young ones in the flocks which we came across. This species has a slow graceful flight. On some evenings the whole army of Pelicans, assembled on the above-mentioned lake, would take flight, and circle leisurely round and round until the soaring birds appeared no larger than small gulls. They never journeyed any distance for their evening flight, but were content to gyrate slowly, gradually ascending or descending without any apparent effort.

HOODED MERGANSER, *Lophodytes cucullatus*.—Chiefly met with on Moose Creek, where it appeared to be breeding in considerable numbers. I saw three or four broods of young Hooded Mergansers in company with the old females, nine or ten young ones in a brood. This species appears to linger in N.W. Canada long after the majority of wild ducks have departed; I shot an old drake on Moose Creek as late as December 1st.

MALLARD, *Anas boscas*.—Common on the Souris River, but comparatively scarce on Moose Creek; the numbers of breeding

birds being largely augmented in the fall by arrivals from more northern regions. This species was last seen on October 21st. Even in the remote region investigated, the Mallards were far warier and more difficult to approach than any other species of wildfowl.

DUSKY DUCK, *Anas obscura*.—A specimen (male) shot on Long Creek, near the Canadian boundary, extends the western limit of this species more than a hundred miles, and disposes of Hunter's statement that "Manitoba is their most western limit." It was, however, the only one met with, or, at all events, secured; the species is rare in this region.

GADWALL, *Anas strepera*.—Numerous as a breeding species on Moose Creek, and young birds were obtained in several stages of development. In September it became common on Long Creek and the Souris River.

AMERICAN WIDGEON, *Mareca americana*.—Only met with in the neighbourhood of Long Creek, where it was plentiful in September.

GREEN-WINGED TEAL, *Querquedula carolinensis*.—Abundant on Long Creek and on the alkaline sloughs in September, but we did not find it nesting.

BLUE-WINGED TEAL, *Querquedula discors*.—One of the commonest ducks on Moose Creek, and many young ones were shot for the "pot." Plentiful throughout the region. The nests which I found were uniformly situated on the banks of a creek, sheltered from observation by a dense growth of tall grasses. The sex of the young in first dress is easily distinguished by a reference to the greater coverts.

SHOVELER, *Spatula clypeata*.—The most abundant duck on Moose Creek, where many pairs breed; plentiful likewise on all adjacent waters. I caught several ducklings of tender age, and found that ten was the usual complement of a brood. The old birds were feeding on aquatic plants.

PINTAIL, *Dafila acuta*.—The only Pintails which we found breeding were two pairs of birds, which nested on Moose Creek. I secured two of the ducklings and one of the old birds; the latter proved to have been feeding on the seeds of some species of rush.

POCHARD, *Aythya americana*.—An adult drake, shot out of a family party at Long Creek, on the 10th September, was the only

example that I secured. We did not meet with the species on any other occasion.

CANVAS-BACK POCHARD, *Aythya vallisneria*.—The only specimen we saw was an adult female, which I shot on Long Creek on the 26th of August. I tried to make it take wing, but it preferred to escape by flapping along the top of the water, its large feet being very conspicuous.

LESSER SCAUP DUCK, *Aythya affinis*.—A common breeding bird at Moose Creek, at Long Creek, and on the Souris River. A nest which I photographed *in situ*, with the eleven eggs which it contained, occupied a slight hollow in the centre of a strip of tall grass; it was lined with feathers and dry bents. The nests which we found were uniformly placed at a very short distance from the water side.

BUFFLE-HEAD, *Charitonetta albeola*.—In September a good many Buffle-heads were met with on Long Creek; chiefly adult males, which consorted largely with *Erismatura rubida*. They especially favoured that portion of the creek which was nearest to its exit from the lake, and, from the agility with which they dived, were difficult to shoot.

RUDDY DUCK, *Erismatura rubida*.—We often enjoyed the quaint attitudes indulged in by this species, which we found commonly represented on Long Creek in September. Its favourite method of resting on the water is to carry its tail cocked up, almost at right angles to the body. We did not shoot any old birds, but obtained specimens of the young in the little-known flapper stage, half down, half feathers.

SNOW-GOOSE, *Chen hyperborea*.—The “white wavy” is well known to the settlers of this district as a bird of double passage, but it does not appear to visit this region in autumn in numbers comparable to those of the spring migration. It was on the 5th of October that I fell in with a gaggle of four Snow-Geese. They were extremely wary, and the fine old gander which I secured cost me a stalk of about four miles. Snow-Geese, when viewed swimming in fresh water, appear to be uniformly white; but if the birds rise, their black primaries at once come into prominence.

CANADA GOOSE, *Branta canadensis*.—A very abundant bird in this region, especially in September. The extreme youthfulness of several of those that I shot satisfied me that they must have been bred in the localities where they were obtained.

AMERICAN BITTERN, *Botaurus lentiginosus*.—This bird proved to be common along the Souris, and in the adjoining swamps, but I never heard the bird “pumping.” The only note which I heard uttered was the croak which it always emitted when flushed. It offers very poor sport, its slow flight and soft feathers rendering it an easy bird to secure. Its dietary is very varied; a bird, whose toilette I unfortunately interrupted, had swallowed twenty small fish, one large black beetle, several grasshoppers, a mouse, and a shellfish about the size of a mussel. When shot it was in a very wet condition; in fact, it was hardly able to fly, and appeared to be dusting itself with powder. I have, personally, no doubt that this species—and such others as possess powder-tracts—employ the powder to dust over and dry their plumage after partial immersion.

GREAT BLUE HERON, *Ardea herodias*.—We met with a few Great Blue Herons on Long Creek.

BLACK-CROWNED NIGHT-HERON, *Nycticorax nycticorax nœvius*.—A single adult, which I shot on Long Creek, was the only one met with.

WHOOPIING CRANE, *Grus americana*.—A number of Whooping Cranes made their appearance upon the stubble on the 7th of October. These appeared to be uniformly adults; but I saw a young one fishing on the banks of the creek in company with two old birds, and stalked them unsuccessfully.

SANDHILL-CRANE, *Grus mexicana*.—These birds were numerous on the stubble-fields at Dalesbro' early in September, and their loud trumpeting could be heard at a great distance. They were excessively wary; I crawled many miles over the prairie in pursuit of them without getting a shot, but eventually shot one from my bedroom window with my rifle.

KING RAIL, *Rallus elegans*.—I wounded a bird of this species (which is rare in the region) upon an alkaline lake 75 miles west of the Souris coal-fields, but not having a retriever, I eventually lost the specimen.

SORA RAIL, *Porzana carolina*.—We saw a few Common Rails on the swamps near the Nameless Lake.

AMERICAN COOT, *Fulica americana*.—This bird proved to be very common in the Souris district.

RED-NECKED PHALAROPF, *Phalaropus lobatus*.—This species was very abundant on the Nameless Lake in September, but the

young considerably outnumbered the adults. They seemed to spend most of their time in floating gracefully on the water, always congregating in flocks composed exclusively of their own species.

WILSON'S PHALAROPE, *Phalaropus tricolor*.—We did not find the nest of this bird, but as I shot two young ones as early as July 21st, it is probable that they breed somewhere near. The birds in question, like one shot in September, contained the remains of numerous small beetles. They consorted freely with other species of waders.

AMERICAN AVOCET, *Recurvirostra americana*.—When shooting on an alkaline slough eighty miles west of the Souris coal-fields, on the 10th of September, we fell in with three of these graceful birds, wading in the shallows, daintily probing the mud with their recurved bills, so little apprehensive of danger that they allowed me to approach within thirty-five yards of them. These were the only examples noticed.

WILSON'S SNIPE, *Gallinago delicata*.—In September Snipe were plentiful on marshy land near the Nameless Lake, but we never met with them in "wisps." Those which I flushed invariably rose singly or in couples; their flight appeared to be less irregular than that of the European bird.

LONG-BILLED DOWITCHER, *Macrorhamphus scolopaceus*.—A few Red-breasted Snipe arrived on the sloughs near Dalesbro' on July 6th; they remained until the end of the month, and I shot several of them, all adult males.

PECTORAL SANDPIPER, *Tringa maculata*.—The only specimens met with were adult males, shot in July on a slough near Dalesbro'.

LEAST SANDPIPER, *Tringa minutilla*.—Large numbers of American Little Stints frequented the shores of an alkaline lake in the Souris district in September. All those brought home are in first dress.

MARBLED GODWIT, *Limosa fedoa*.—This bird breeds sparingly near Dalesbro'; I found four highly incubated eggs *in nido* on the 28th June. Several large flocks of this Godwit made their appearance on the 29th of August. Their loud shrill whistle is audible at a great distance.

GREATER YELLOW-LEGS, *Totanus melanoleucus*.—Large numbers of the Greater Yellowshanks frequented the alkaline lakes

in August and September, never alone, but always in flocks, usually accompanied by some of the allied species. When the large flocks of *Limicolæ* were disturbed and took wing, the loud clear whistle of this Sandpiper could always be distinguished from the mixed babel of the mingled host.

YELLOW-LEGS, *Totanus flavipes*.—The first example of the Lesser Yellowshank that I came across was a solitary bird, which frequented a slough near Dalesbro' on the 9th July. On the 21st of the same month a flock of this species appeared on another slough. I shot two adult birds, both males. I never happened to fall in with the species again.

SOLITARY SANDPIPER, *Totanus solitarius*.—As early as July 6th I shot an adult which had probably been breeding near Dalesbro'. No others were seen until August, when the species became abundant, but disappeared at the end of the month.

WILLET, *Symphemia semipalmata*.—This wader breeds numerously near Moose Creek, laying three eggs in a slight hollow in the ground, screened by the long grass which clothes the banks of the creek. The old birds are extremely solicitous for the safety of their young, disturbing a whole neighbourhood with their piercing vociferations of "wil-ette, wilet, wilette." They used to follow me most persistently along the creeks, and spoilt many a coveted shot. Long before they can fly the nestlings accompany their parents to the sloughs, and the exact whereabouts of the birds in half-down may often be ascertained by noticing the watchfulness with which the adults drive away Swainson's Buzzards from the vicinity of their young charges.

BARTRAM'S SANDPIPER, *Bartramia longicauda*.—One of the most familiar of the summer birds of this region, locally known as the "Quail." Unlike the majority of species, Bartram's Sandpiper nests on the prairie, generally at some distance from water. Four eggs usually constitute a clutch. I photographed a nest *in situ*. On returning to the spot, I found the nest had been roofed in with stems of dry grass, these being interwoven with the blades of long grass growing around; a hole for entrance or exit had been left on one side. The present species has a curious habit of holding the wings in a vertical position for a few seconds after alighting on the ground, a trait which displays the barred lining of the wings to great advantage. The gizzards of the birds dissected usually contained small black beetles.

SPOTTED SANDPIPER, *Actitis macularia*.—This picturesque little Sandpiper builds its slight nest on the banks of most of the creeks and rivers. The eggs vary in number from three to four. We never met with this Sandpiper on the sloughs or alkaline lakes; from which I infer that it prefers running water to stagnant pools.

KILLDEER PLOVER, *Agialitis vocifera*.—This charming Plover of the prairie proved to be nesting numerously in all the district. Many are the ruses employed to attract a stranger away from its young. Sometimes it lies on the ground with one wing extended and the tail expanded like a fan, as if endeavouring to draw attention to the bright feathers of the rump and tail-coverts. The pattern of the markings of the young in down correspond to the feathering of the adults.

PINNATED GROUSE, *Tympanuchus americanus*.—This bird appears to be rare in the region. The only example that we came across was an old cock, which I shot near Moose Creek in July.

PRAIRIE CHICKEN, *Pediocetes phasianellus campestris*.—The Common Sharp-tailed Grouse breeds generally in this region. Dr. Coues states that thirteen was the largest number of eggs which he found in a clutch; their number ranges from ten to fourteen, but I only found the latter number on two occasions. It has been stated that this bird does not feed on grain, but this is a mistake. Its chief food is the seed-vessel of a wild rose; but it resorts to the stubbles in autumn, and feeds on grain greedily. Some of those which I shot in the stubble contained nothing else but grain; others had a few small grasshoppers in their crops.

PASSENGER-PIGEON, *Ectopistes migratorius*.—A few Passenger-Pigeons were observed on the wooded banks of the Souris at Oxbow in June; presumably they breed there, but we did not find a nest.

TURKEY-BUZZARD, *Cathartes aura*.—The only Turkey-Buzzard that I met with in this district was shot on Sept. 13th, near the Souris River. It was feeding on the carcass of an antelope.

SWALLOW-TAILED KITE, *Elanoides forficatus*.—My attention was drawn to a bird of this species by the hubbub created by a party of King-birds, which mobbed the rare stranger with the utmost temerity. The hawk struck one of the boldest of its persecutors, which fell to the ground near me with a fractured

carpus. The stately Kite pursued its journey southward with equanimity, and soon left its persecutors far astern. I never met with the species afterwards.

AMERICAN MARSH-HARRIER, *Circus hudsonius*.—Abundant in the Souris district, but the blue dress of the adult male is relatively uncommon. This Harrier feeds principally on grasshoppers, but occasionally picks off a small bird, and is a source of some discomfort to the settlers, who begrudge the blackmail which it levies on their poultry-yards.

SHARP-SHINNED HAWK, *Accipiter velox*.—This game little hawk was fairly common near the Nameless Lake in September. Those which I dissected had been feeding on small birds.

RED-TAILED HAWK, *Buteo borealis*.—A few breed on Moose Creek, but we did not find this species on the Souris River. Those that I dissected had fed on grasshoppers, with the exception of one individual, which contained a Red-winged Starling.

SWAINSON'S HAWK, *Buteo swainsoni*.—One of the commonest birds of prey, especially near Moose Creek. I found half-a-dozen pairs of these birds nesting within an area of four miles. The anxiety evinced by the old buzzards, as they soared aloft, generally led me to their nests. Dr. Coues states that he generally found two eggs of this species in a clutch; never more, and sometimes only a single one. I never found less than two eggs or young in a nest, but several of our nests contained three young birds. A nest of this species, which I photographed on July 30th, was a fairly substantial structure of dead twigs, placed on the top of a prickly thorn, about twelve feet from the ground.

GOLDEN EAGLE, *Aquila chrysaetos*.—The Golden Eagle is believed to be a comparatively rare bird in this region, at any rate, as a breeding species. On the 11th July I observed a fine Golden Eagle circling in the air at a great height above Moose Creek. Three days later its eyrie was discovered by a settler named Reed, situated on the bank of a small ravine. It contained three young birds of different sizes, but all feathered and equally intent on eating the gophers which the old birds had catered for them. On Reed's approach these eaglets fluttered out of the nest and sought to escape, defending themselves so pluckily that Reed killed them with stones. The smallest eaglet still retained much down. I may add that though the Golden Eagle was not observed in the Souris River, yet we found a nest on the bank of

a ravine in that district, which we could not assign to any other species; it was a very cumbrous pile, composed of large sticks and the dry "ribs" of buffaloes.

PIGEON-HAWK, *Falco columbarius*.—A common species in the Souris district, preying on small birds.

AMERICAN SPARROWHAWK, *Falco sparverius*.—A few pairs bred in the vicinity of Moose Creek. The birds which I dissected had been feeding on grasshoppers.

AMERICAN LONG-EARED OWL, *Asio wilsonianus*.—Only met with on the Souris River, near Oxbow, Nov. 5th, when I saw half-a-dozen. The example which I shot to identify the species had been feeding on mice.

SHORT-EARED OWL, *Asio accipitrinus*.—This owl was common on the Souris River in September, and at Dalesbro' after the last days of October. I shot one on Nov. 8th, and saw several others, though the snow lay a foot deep on the prairie.

SNOWY OWL, *Nyctea nyctea*.—Although the Snowy Owl is believed to be exclusively a winter visitor to this region, instances of its lingering on its winter hunting-grounds far into spring are forthcoming. For example, a Snowy Owl, which I examined in the flesh, had been obtained alive by J. N. Davis as late as the 29th May. In the autumn the first Snowy Owls, three in number, made their appearance on Sept. 29th, and the species was fairly represented by the middle of October. An example which I met with on Nov. 17th, appeared to be perfectly white, but its great wariness defeated my attempts to stalk it, though I shot another individual of the same species on the following day.

BELTED KINGFISHER, *Ceryle alcyon*.—In the neighbourhood of Long Creek we often watched Belted Kingfishers waiting for their prey, perched on some bough overhanging the water.

FLICKER, *Colaptes auratus*.—When camping on the banks of the Souris River, we constantly saw Golden-winged Woodpeckers; indeed they often perched on our tent when we were miles away from trees. Those which I dissected had been feeding on ants.

WHIP-POOR-WILL, *Antrostomus vociferus*.—This species was numerous at Moose Mountain, where it bred.

NIGHT-HAWK, *Chordeiles virginianus sennetti*.—This species breeds numerous near Dalesbro'. During the day the birds are generally to be found squatting on ploughed land or upon a stone upon the prairie. During the first hours of the morning,

however, I often observed them hawking near the ground in swallow-fashion, especially near the corral where the cattle were kept. Their so-called "booming" is made when they turn to ascend; the pressure of air on the primaries causes them to vibrate, thus producing the noise in question.

CHIMNEY-SWIFT, *Chætura pelagica*.—The only example that I observed the whole summer came under our notice near the Little Pipestone, May 26th, 1891.

RUBY-THROATED HUMMING-BIRD, *Trochilus colubris*.—On the 20th August I watched a male bird darting about the bushes in a ravine at the Souris coal-mines. At the first glance I mistook it for a butterfly, but was soon undeceived. I had my gun with me, but had not the heart to shoot it.

KINGBIRD, *Tyrannus tyrannus*.—This vivacious species was almost ubiquitous, nesting all along Moose and Long Creeks, and darting at the head of any intruder. It was pretty to see the male bird perching on a bush and warbling a song to his sitting mate, rising into the air, hovering to pass dexterously on a passing insect, and returning fondly to its mate. All the nests possessed a certain protrusion of sticks on one side. The stomachs of all the birds examined contained the remains of insects.

ARKANSAS TYRANT-FLYCATCHER, *Tyrannus verticalis*.—This bird is not included in Mr. Thompson's 'Birds of Manitoba'; but he has kindly identified one of those which I shot on the banks of the Souris River, where it breeds in small numbers. It feeds chiefly on grasshoppers.

PRAIRIE SHORE-LARK, *Otocorys alpestris praticola*.—A common breeding bird, generally to be met with on the prairie along the trail of the settlers.

CANADA JAY, *Perisoreus canadensis*.—The "Whisky Jack" of the settlers is frequently seen on the wooded banks of the Souris, and breeds there; I met with it also at Moose Mountain.

NORTHERN RAVEN, *Corvus corax principalis*.—While travelling on the trail between Dalesbro' and Cannington early in July, I saw two Ravens sitting on a rail, and got within thirty yards of them. They were waiting to feed on the carcass of a dead cow on the prairie.

AMERICAN CROW, *C. americanus*.—Generally observed near the prairie towns, where they feed directly after daylight.

BOBOLINK, *Dolichonyx oryzivorus*.—To be seen everywhere on the prairie, perching on the buffalo scrub, both in the rich nuptial dress of the male and in the more sober attire of the female. Coues does not mention that this bird feeds largely on insects. One of those that I dissected was crammed with red grasshoppers.

COWBIRD, *Molothrus ater*.—An abundant species, partial to following the herds of cattle.

YELLOW-HEADED BLACKBIRD, *Xanthocephalus xanthocephalus*.—We found this species breeding on Moose Creek, and shot one out of a flock at Long Creek. It feeds on small grasshoppers.

RED-WINGED BLACKBIRD, *Agelaius phœniceus*.—An abundant summer resident in the neighbourhood of willow-fringed creeks.

WESTERN MEADOW LARK, *Sturnella magna neglecta*.—This species nests plentifully on the open prairie. When flushed it soon alights, but only to run to a fresh place of concealment.

BREWER'S BLACKBIRD, *Scolecophagus cyanocephalus*.—Abundant in August on the banks of the Souris River, flying in family parties.

AMERICAN GOLDFINCH, *Spinus tristis*.—A good many pairs nested at Moose Creek; and, though breeding, were generally to be seen flocking together. This fact is to be explained by the consideration that the garden of wild flowers, from which they gleaned their favourite seeds, was situated on the open prairie, nearly a mile from the bushes which held their nests.

SNOW-BUNTING, *Plectrophenax nivalis*.—Very common in the fall, feeding on the grass-stems which peered above the snow, as well as on the grain-stacks; they always feed with their heads to the wind.

BLACK-BREASTED LONGSPUR, *Calcarius ornatus*.—Breeds commonly on the prairie round Dalesbro', and feeds on grass-seeds.

WESTERN SAVANNA SPARROW, *Ammodramus sandwichensis alaudinus*.—I shot a specimen in the Souris coal-field district on the 10th September.

BAIRD'S SPARROW, *A. bairdii*.—Fairly represented in this region. One shot on August 3rd had been feeding on small red grasshoppers.

CLAY-COLOURED SPARROW, *Spizella pallida*.—Common, breeding in the scrub about Moose Creek. One bird nested on the ground in a tuft of grass, and was flooded out; but built again and reared a brood in a similarly lowly situation.

SONG-SPARROW, *Melospiza fasciata*.—Common in the district, nesting on the ground, and using a little horsehair in the lining.

CLIFF-SWALLOW, *Petrochelidon lunifrons*.—Half-a-dozen pairs nested under the eaves of a stone house at Carlyle; we did not meet with the species elsewhere.

BARN-SWALLOW, *Chelidon erythrogaster*.—The only male and female preserved belonged to a small colony which were nesting among the rafters of a sod cabin.

WHITE-RUMPED SHRIKE, *Lanius ludovicianus excubitorides*.—The only one observed was an adult, which we saw perching on a pile of wood at the Little Pipestone Creek.

YELLOW-THROATED VIREO, *Vireo flavifrons*.—This warbler bred commonly in the scrub along Moose Creek.

SALMON AND TROUT CULTURE IN NATAL.

By COL. H. W. FEILDEN, C.M.Z.S.

DURING the past few years various endeavours have been made to stock the rivers of the garden colony of South Africa with Salmon and Trout, and these attempts have proved so far satisfactory that the best results may be hoped for, though the complete acclimatization of *Salmonidæ* in South African rivers cannot yet be described as a thoroughly accomplished fact.

The colony of Natal, embracing an area equal to about that of Scotland, rises by a series of steps from the Indian Ocean to its highest altitude in the peaks of the Drakensberg, and is watered throughout by a network of rivers and streams having their sources in that great mountain range which forms the western and northern boundary of the colony. To the eye of the casual traveller through Natal, most of the rivers appear the very ideal of trouting streams, and when one sees them issuing from the mountains through beautifully wooded kloofs (valleys), these bright, clear, cool streams remind one of good trout waters in English dales or Scottish Highlands. The similitude is heightened when a snow storm occurs, as I have myself seen in the northernmost, or Klip River, division of the colony, covering the summits of the Berg, plentifully bestrewing the outlying spurs and extending over the lower plains, causing great damage to

flocks and herds. I there noted very striking contrasts, such as tree ferns and orchids powdered over with snow, *Nectariniidæ*, or Sun-birds,—the Old-World representative of the Humming-bird,—flitting round the blossoms, when I stood watching them ankle-deep in snow; Baboons were crying from their snow-clad ledges; the vleys, or small lakes at the foot of the mountains, had ice on them; and yet this same snow-clad area, only a few years ago,—when the white man appeared first on the scene,—was the haunt of the Eland, Elephant, Hippopotamus, and other large mammals associated in our minds with tropical heat and “Afric’s sunny fountains.”

I do not suppose that the temperature of the rivers in Natal, especially in their higher reaches, can be inimical to the breeding of Trout, and though, so far, there is no absolute certainty that the Trout already turned out have reproduced their species in Natal streams, yet there is abundant proof that those turned out have done exceedingly well, and have grown with great rapidity.

The initial steps in the interesting attempt to introduce the young of Salmon and Trout is due to an energetic and well-known colonist, Mr. John C. Parker, of Tetworth, Karkloof. This gentleman, in or about the year 1885, erected a hatchery on his estate, and imported ova. The shipment was unsuccessful, all the ova had perished. Two years later he imported more, but again with results only short of absolute failure:—out of 10,000 ova all were dead but twenty-seven, and these produced no fry strong enough to be turned out. Disheartening as was the outcome of these two experiments, Mr. Parker never lost faith in the enterprise, and with the co-operation of Mr. Cecil Yonge, then a member of the Legislature, the Council when appealed to made a grant of £500. These two gentlemen, with Col. Vaughan of Mooi River, formed—and still form—the official board for the carrying out of the enterprise for Salmon and Trout culture.

The first shipment of ova under the new direction took place in 1890; it consisted of common Brook-Trout, *Salmo fario*, and Loch Leven Trout, *S. levenensis*; of both kinds there were about 75,000 ova. The Brook-Trout proved almost a complete failure; the Loch Leven ova did better: out of 75,000 eggs some 1500 fry were hatched out, and in quantities of 500 were put into the Mooi, the Bushman’s, and the Umgeni rivers. This success was

considered sufficient by the Legislative Council to warrant the continuance of money aid, and for the second year the ova of three sorts of trout and one kind of salmon were procured.

The trout consisted of the same kinds as those first imported, with the addition of 10,000 American Brook-Trout, *S. fontinalis*; the number of salmon eggs, *S. salar*, was 20,000. The American trout gave bad results; most of the ova perished, and of two hundred hatched only thirty reached the stage for turning out. These were placed in a small stream in the Karkloof, and as none have since been seen it is uncertain whether any survive. The results attending the ova of *S. fario* and *S. levenensis* were similar to the first year—about 4500 trout-fry were turned out, the majority being *S. levenensis*; in lots of 500 they were put into the Umgeni, Umkomanzi, Mooi, Bushman's, Umsindusi, Umvoti, and other rivers.

The whole of the salmon-fry, about nine hundred, were turned into the 'Mcobene, a tributary of the Umkomanzi, at a spot a few miles above the junction. The Umkomanzi is without large falls, and the fish could easily travel down to the sea and back to its upper reaches, as far as obstacles in the river are concerned; but doubts have been expressed as to the suitability of the temperature of the Natal rivers for salmon, and in addition we are quite in the dark as to the possibility of a salmon surviving in the temperature of the Indian Ocean, whilst we are cognisant of the fact that the Indian Ocean abounds with sharks, porpoises, and other enemies.

During 1892, the third year of the enterprise, 180,000 ova were brought out in two shipments. The second consignment was unfortunate in being delayed through an accident to the machinery of the ship on which they were being conveyed. Better fortune attended the English Brook-Trout last year, whilst *S. fontinalis* were again unfortunate, the results being barren. Of the *S. fario* and *S. levenensis*, hatched in 1892, quantities of four to five hundred have lately been put into the Bushman's, Umkomanzi, Ilovo, Lotine, Mooi, Klip, Incandu, Ingogo, Sunday, and Lion's rivers. The balance of two or three thousand has been distributed among applicants to put into various small streams. Only some three hundred salmon reached the fry stage, and they have again been put into the Umkomanzi.

I have received lately an interesting letter from Mr. John Parker, dated 24th Nov. 1892, from which I take the following extract:—"As to salmon, I am sorry I can give you no information beyond the fact that I kept four salmon-fry in one of the hatching-boxes for six months. These got no food except what came down with the water. They were quite healthy, but did not appear to grow quite so fast as trout-fry under similar conditions. Unfortunately a thunder-storm flood came and washed the salmon-fry into the stream running past the hatcheries. Of course it is open to grave doubt whether salmon will succeed in Natal rivers; but as no one has yet fished the Umkomanzi for a grilse there is still the element of uncertainty about them, and I live in hopes of catching one in the autumn, if I can get away. The trout are doing well; the first I caught was thirteen months old and measured $6\frac{3}{4}$ inches; then, twelve months after that, two, 8 inches and $9\frac{1}{2}$ inches long. This year (1892) I went to the Umgeni for a specimen, and in less than twenty minutes got one weighing 2 lbs. 2 oz., length 17 inches; it was taken with a 'March-brown,' and its age was two years and four months. It is now in the Museum at Pietermaritzburg, and is a *S. levenensis*. This coming winter (May to August, 1893) these trout will be only three years old, and they may spawn. Seeing that they grow so well, and are fat and healthy, I do not see why they should not breed in our Natal rivers."

I hope that the spirited enterprise of these Natal gentlemen, assisted by the Legislative Council, may be crowned with complete success. If the rivers of Natal can be stocked with trout, I believe that the money spent will bring forth fruit a hundredfold. The colony of Natal is the garden of South Africa, and is pre-eminently suited to be a home for that class of colonist who, in the old country, has been brought up with some ideas of sport, and I think that the certainty of a good trout stream at one's door would be the deciding attraction in inducing many a suitable man to elect Natal for his adopted home.

CONTRIBUTIONS TO A VERTEBRATE FAUNA OF THE
ISLE OF MAN.

By P. M. C. KERMODE.

THE situation of the Isle of Man makes it an interesting district for the naturalist. If its vertebrate fauna is not extensive, its limitations are suggestive. Bishop Wilson, writing for Gibson's edition of Camden, published in 1772, says:—"There are several noxious animals, such as badgers, foxes, otters, filmerts, moles, hedge-hogs, snakes, toads, &c., which the inhabitants know no more of than their names." The absence of reptiles is not more striking than the absence of fresh-water fish; and in every department of Zoology one is impressed by the affinities of our fauna with that of the district,—the most distant of the surrounding lands:—Ireland, so much so, that if a form is not to be found in Ireland, it is useless looking for it as indigenous in the Isle of Man.

With respect to our fish, Prof. Edward Forbes contributed a brief account of the Natural History of the island to Quiggin's 'Illustrated Guide,' 1842, in which he mentions some rare forms not since recorded. Mr. R. Garner, in his 'Holiday Excursions of a Naturalist,' 1864, referred to several, adding the Blue Shark, and one or two others not rare. In 1885 Mr. J. C. Crellin presented a revised list to our local Natural History Society, to which I am not able to add more than five species. In arrangement and nomenclature I have followed Day, in his 'Fishes of Great Britain and Ireland,' 1880-84.

Of mammals, the only extinct species whose remains are now found is the Irish 'Elk,' *Cervus megaceros*, of which a fine specimen from Ballaugh, Isle of Man—the first complete skeleton ever put together—is to be seen in the Edinburgh Museum. The Red Deer is recorded as having been introduced, but has long since disappeared. In 1885 I contributed a list of mammals to our Natural History Society, and it was published afterwards in the 'Manx Note Book.' I am not yet able to add any species, except the Long-eared Bat, which I then believed to be present, and have since had, both dead and alive.

MAMMALS.

The list of indigenous mammals is very limited, the following being all that I know of:—

Vespertilio pipistrellus, Geoff. Common Bat, or Flittermouse. The Manks name, Craitnag, *i. e.*, skinny or wrinkled, is expressive of its appearance. From April to October it may constantly be seen at dusk, and in mild weather I have noticed an odd one so late as the beginning of December and so early as the beginning of April. It appears unable to rise from a flat surface, and a tame one, if placed on the floor, would make for the curtains or something up which it could climb; if on the table it would crawl to the edge, and holding on by the hooked claw of the thumb, would shake out the folds of its wings and flutter till it got the support of the air, when it would drop off and fly. This is one of the Cadlagyn or “Sleepers,” of which there are supposed to be seven. The Seven Sleepers, “Ny shiaght cadlagyn,” are:—Foillycan, butterfly; Shellan, bee; Jialg lheer, lizard; Craitnag, bat; Coog, cuckoo; Clogh-ny-cleigh, stone-chat, *i. e.*, wheatear; and Gollan-geayee, swallow.

Plecotus auritus, Geoff. Long-eared Bat. Not so common as the last. Seen from middle of May to September.

Erinaceus europæus Linn. Hedgehog. Now common all over the island, but appears to have been introduced about the beginning of this century. The dictionaries give three words as the Manks equivalent for hedgehog: ‘Muc-cleigh,’ which is simply a literal rendering; ‘Gray-noge,’ said to imply something causing horror; and ‘Arkán-sonneys, a fabulous creature ominous of plenty.’ I have, however, never heard any of these applied by a native. The hedgehog hibernates here, as elsewhere; a young one that I caught on Oct. 7th, 1890, went to sleep, very suddenly, on Christmas Eve, and began to wake on April 19th following. I heard of another that went to sleep in October of the same year; it was kept in a coalhouse, mine in a little greenhouse, which would account for the difference.

Sorex araneus, Linn. Shrew. Cregeen’s dictionary gives Thollog faiyr as the Manks, and the Rev. J. T. Clarke, in the Manx Society’s dictionary, Thollag airhey, which is the form I have heard, and means literally “golden louse.” In the north of the island it is called also “grass mouse.” It is not un-

common. I have caught one in broad daylight, when in the act of crossing a country road, but it is more frequently seen dead than alive.

Mustela erminea, Linn. Stoat. Generally passes by the name of Weasel, as it does also in Ireland. The Manks name is Assag, pronounced Atthag, and 'Daney as attag,' "Bold as a weasel" is a well-known saying.

Phoca vitulina, Linn. Common Seal. Raun or Rhoan. Usually one or two are to be seen about the coast in the summer.

Mus sylvaticus, Linn. Long-tailed Field Mouse, Lugh-varghey, *i. e.*, Meadow-mouse, and Lugh-slieau, Mountain-mouse.

M. musculus, Linn. Lugh. Very plentiful. I have known it make a very neat little nest of shreds of paper which it had torn off, regardless of the contents. "Singing mice" I have heard, and been since told of by others.

M. rattus, Linn. Black Rat. Appears now to be extinct. I have never seen one here, and only occasionally heard of it.

M. decumanus, Pall. Brown Rat, Roddan. Introduced probably towards the end of last century, and their numbers constantly recruited.

Lepus timidus, Linn. Common Hare, Mwaagh. The Manks equivalent to "Birds of a Feather" is Furree yn mwaagh rish e heshey, *i. e.*, "The Hare will be found with his mate." It is the object of superstition, and a favourite form to be assumed by a witch, and, the son of a witch who himself dabbled in the black art, has been known as Gaaué mwaagh,—"The Hare-smith." The natives would not think of eating a hare.

L. cuniculus, Linn. Rabbit, Conning (no doubt a corruption of the English word 'Coney'). It sometimes nests in the gorse without burrowing. Plentiful in 1658. I have not met with an earlier notice.

Phocæna communis, Less. Common Porpoise, Perkin. The dictionary gives Garmanagh, a word I have never heard, and adds, "we also use Muc-varrey." The Porpoise is common especially about Peel. Perkin vooar, *i. e.*, "big porpoise," may be applied indiscriminately to this or some larger cetacean. That other forms have approached our shores is certain. In 1885, I received a letter from Mr. Corrin, of Peel, in reply to some enquiries concerning one taken about 1860. He wrote:—"The large 'fish' captured off Peel twenty-five years ago was not a true

Sperm-Whale, but a species of Finner called the Rorqual Whale, and known to our fishermen as the Great Herring-Hog. It measured, from snout to tail, 30 ft. 1 in. ; span of tail, 14 ft. 6 in. ; dark coloured on the back, somewhat like the colour of a Rock-Conger, and white all over the belly ; it was beautifully fluted on the belly from the gills to within 14 ft. of the extremity of the tail, and from there to the end of the tail quite smooth ; its weight was over six tons, and on being dissected it was found to have a young one in its womb ; its stomach was found to contain more than a cartload of *Thysanopoda*, or fringe-foot (a little crustacean very similar to, but rather smaller than, a shrimp), as well as a quantity of herrings. It was harpooned by William Lumsden, Esq., and after we had been in the tow of the fish for eleven hours, sometimes going at enormous speed through the water, during which we must have travelled backwards and forwards more than one hundred miles, it died, and we succeeded in bringing it into Peel. The jaw-bones, which were very large, have been preserved, and are, I believe, still in the possession of Mr. Lumsden, Glenaspet, Patrick."

The late Mr. Lumsden had been on more than one whaling expedition, and no doubt would recognise the species, but the reference to the curious "fluted appearance" would alone suffice to identify this as a small Rorqual, *Balenoptera boops*, Flem.

REPTILES.

There are only two indigenous reptiles, namely, the two species of lizard:—'Jolgan-leaghyr'—*Zootica vivipera*, Wagl., viviparous lizard, plentiful throughout the island; and *Lacerta agilis*, Linn., sand lizard, more common in the north. A local name is "Man-creeper," and these pretty and harmless creatures are too often sacrificed to a foolish superstition. The lizard is one of the Cadlaghyn, or Sleepers (see above under "Bat"). I have known it dug out of a hedge in a torpid state, in early spring.

Prof. Edward Forbes, in his sketch of our Natural History contributed to Quiggin's 'Illustrated Guide,' adds:—" *Triton palustris*, Warty Eft, and *Triton punctatus*, Common Eft, are by no means rare in their different habitats everywhere." I can only say that I have looked in vain for these, but have never even heard of them, and think the mention of them must be due

to a slip of the pen. Prof. Forbes also says:—"Frogs are abundant, though they are popularly believed to have been imported, an idea for which there is no foundation." But Sacheverell, Governor of the Island in 1696, in his 'Short Survey of the Isle of Man,' remarks on the Curragh, in Kirk Christ Legayre, "not producing frogs or toads; though this may not seem strange in the neighbourhood of Ireland, both nations ascribing it to the blessing of their common apostle, St. Patrick." He offers some curious speculations on the cause. And Bishop Wilson, writing prior to 1755, expressly says in his 'History of the Isle of Man,' contributed to Gibson's edition of Camden (4th ed., 1772, p. 392):—"It is not now two years since somebody brought in frogs, which they say increase very fast."

The Frog, *Rana temporaria*, Linn., for which there is no Manks name, is now abundant throughout the island.

FISH.

The most noticeable thing with respect to Fish is the absence of fresh-water forms, of which only two Sticklebacks, Salmon, Trout, Eel, and Lampern are to be met with.

Labrax lupus, Cuv. Bass, Eeast, which is also the Manks for the class of fish generally. Plentiful about July.

Mullus barbatus, Linn., var. *surmuletus*. Surmullet. About July; not common.

Pagellus centrodontus, Cuv. and Val. Common Sea-bream, loc. Carp, as on the N.E. coast of Ireland, "Carf, Carp." July and August. This is included by Forbes under the name of *Pagrus vulgaris*.

Cottus scorpius, Linn. Father lasher, Kione tramman, and Bullkione. Common in rock pools left by the tide; generally small, about 4 to 6 in.

C. bubalis, Euph. Bubalis, Lucky proach.

Trigla lineata, Gmel. Streaked Gurnard, Crodane, a generic term: compare the Gaelic, Cnudan, cnodan, crudan.

T. cuculus, Linn. Elleck, Crodane jiarg, Captain jiarg.

T. hirundo, Linn. Tubfish. I have never seen anything more beautiful than the colours of the pectoral fins of this fish when first brought out of the sea. Off the coast in July and August; not so common as the last.

T. gurnardus, Linn. Gurnard, Grey Gurnard, Crodane

glass, a local name for the young is 'noud.' Comes with the Red Gurnard, but in greater numbers. I have not noticed the white spots shown in Day's figures (Pl. xxv.).

Agonus cataphractus, Bl. Schn. Pogge. Mentioned by Professor Forbes under the name of *Aspidophorus cataphractus*, and, on his authority, included in Mr. Crellin's List. I have never seen it.

Lophius piscatorius, Linn. Angler, Gilley-pern. Not common. In the summer of 1885 I saw one about 3 ft. 6 in. long, washed ashore at Maughold Head, evidently choked by a large cod fish which was sticking in its throat.

Trachinus draco, Linn. Greater Weever. On 1st December, 1883, I got one taken by a trawler from off Bahama bank. It measured 14 in., and weighed 10½ oz. Forbes mentions it.

T. vipera, Cuv. and Val. Viper Weever, Colgagh. Not uncommon with sand eels.

Scomber scomber, Linn. Mackerel, Breac-Keayn.

S. colias, Gmel. Spanish mackerel. In Mr. Crellin's List. I do not remember to have noticed it.

Caranx trachurus, Lacép. Scad, Horse-mackerel, Breac frengagh. Not uncommon. On 23rd September last year I saw about half a dozen which had been taken off Laxey; they were about 17 in. long. This fish is not sold, but the fishermen eat it.

Zeus faber, Cuv. John Doree. Not common. On 30th May, 1883, I got one which had been trawled in Ramsey Bay: a female, with roe like grains of mustard-seed in a sac the size of a duck's egg, but flat. Its length was 17 in., and it weighed about 5 lbs.

Gobius ruthensparri, Euphr. Two-spotted Goby. This, which is the *G. minutus* of Nilsson, is probably the species mentioned under that name by Forbes. I have taken it in Ramsey Bay.

G. paganellus, Gmel. Paganellus. Rock pools.

G. niger, Linn. Rock Goby. A local name for it is "Miller's Thumb." I do not remember to have seen it longer than 4 to 5 in

Callionymus lyra, Linn. Dusky skulpin (female), Gemmous dragonet (male). Mentioned by Forbes, and included by Mr. Crellin on his authority.

Cyclopterus lumpus, Linn. Lump-fish, Kiark-varrey, Hen-fish. Not uncommon. On 13th February, 1882, I got a specimen full of roe, trawled off Maughold Head. A small one was speared off the Queen's Pier, Ramsey, by a diver, in July, 1885. On 7th September, 1889, I got a young one, 1 in. long. The fin-rays were no longer visible.

Carelophus ascanii, Collett. Yarrell's Blenny, Dhoom, Maughold. I have a specimen which I caught in a rock-pool.

Blennius ocellaris, Linn. Dr. Day, 'British Fishes,' i. p. 202, quotes:—"Has been recorded as having been dredged up on a scollop-bank in twenty fathoms of water, off Ballaugh, in the Isle of Man, in June, 1834" (Forbes, Mag. Nat. Hist.' 1836, ix., p. 203).

Centronotus gunnellus, Bl. Schn. Butterfish, Cadlag, Nine-eyes. Common; sometimes used for bait.

Mugil chelo, Cuv. Lesser Grey Mullet. Come in shore about April if fine; on hot days in summer hundreds may be seen basking about the edge of the water. My friend Mr. J. C. Crellin enjoys a novel sport at which he is an adept, namely, shooting these fish as he walks along the beach between Michael and Ballaugh; his spaniel retrieves them.

Gasterosteus aculeatus, Linn. Three-spined Stickleback, Jack Sharp. In brackish water at the mouth of small streams.

G. pungitius, Linn. Tinker, Breakfeather. Common in the currages and trenches of the north of the island.

G. spinachia, Linn. Fifteen-spined Stickleback, Snaid-varrey, *i. e.*, needle-fish.

Labrus maculatus, Bl. Ballan wrasse. Forbes gives this, and *L. lineatus*, which Day considers a variety of it, and *L. pusillus*, the young. Abundant, *L. maculatus* being the most common form.

L. mixtus, Fries och Ekstrom. Striped, or Cuckoo Wrasse (male); Three-spotted Wrasse (female). Not uncommon. I have heard "Coot" as a local name for the male.

Crenilabrus melops, Cuv. Baillon's wrasse. This is the *C. tinca* of Yarrell, under which name it is mentioned by Forbes.

Gadus morrhua, Linn. Cod, Boiddagh. Common, as is the variety, Red or Rock Cod, locally Boiddagh-jiarg. To Day's remarkable list of the contents of Cod's stomachs, I can add *Halithea aculeata*, Sea-mouse, of which some years ago I took two large specimens, one being quite fresh. Whelk is the

favourite bait here. There is an inshore fishing from August to January, and a deep-sea fishing from February to April. The fishing is considered not so good as formerly, and this in part due to the destruction of spawning cod and of the fry.

G. aeglefinus, Linn. Haddock, Attag.

G. luscus, Linn. Bib, Whiting-pout. We used to get a fish off Maughold in the summer when fishing Whiting which we called the Miller's Thumb or Poltag. I feel certain, but speak from memory, it corresponded exactly with Day's figure and description of this species.

G. merlangus, Linn. Whiting.

G. virens, Linn. Coal-fish, Green Pollack, Bloggan, Sargeant, Scieen, Gilpin, and, when very large, Saithe.

G. pollachius, Linn. Pollack, Kellag, calig. Common round the coast.

Merluccius vulgaris, Cuv. Hake.

Phycis blennoides, Bl. Schn. Greater fork-beard. From 1882 to 1885 I received several specimens trawled from a muddy bottom off Peel. They were taken from April to the end of July, and two or three of them (in July) were females having a small roe. Day ('British Fishes,' i., p. 304) says—"The species has not been recorded above 2 ft. long from the British Isles," but two of my specimens measured $24\frac{1}{4}$ in., one $24\frac{1}{2}$ in., and one $22\frac{3}{4}$ in.; the greatest weight was $5\frac{3}{4}$ lbs.

Molva vulgaris, Flem. Ling.

Motella tricirrata, Nilss. Three-bearded Rockling. About Castletown. I have taken it among stones off Gob-ny-ròna, near Ramsey.

Ammodytes lanceolatus, Lesauvage. Larger Sand-Launce, Gibbon-vooar. Has been taken on a hook in Ramsey Bay, and off the south of the island.

A. tobianus, Linn. Lesser Launce, Gibbon, Sand-eel. Plentiful. Used to be taken with reaping-hooks, as described by Thompson, of the last species on the coast of Down. A harrow has also been used, the people following it, picking up the fish.

Hippoglossus vulgaris, Flem. Holibut. On 11th May, 1885, one was taken on a long-line in Ramsey Bay, 6 ft. by 2 ft. and 6 to 7 in. thick, weighing 146 lbs., and in November, 1891, one was taken off Bahama Bank, weighing 140 lbs. Day, 'British Fishes,' ii., p. 8, quotes:—"An example, $7\frac{1}{2}$ ft. long and 320 lbs. weight,

was recorded from off the Isle of Man ('Mag. Nat. Hist.' 1829, i., p. 84), and is, perhaps, the example stated by Parnell to have (been) sent to the Edinburgh market (1828)."

Rhombus maximus, Cuv. Turbot. Not common. I have known it taken up to 22 lbs. off Maughold Head.

R. lævis, Rondel. Brill.

Zeugopterus punctatus, Collett. Müller's Top-knot. One was brought to us at the Biological Station, Port Erin, 24th Sept., 1892.*

Pleuronectes platessa, Linn. Plaice, Liebbage-spottagh.

P. limanda, Linn. Dab.

P. flesus, Linn. Flounder, Liebbage, Fluke.

Solea vulgaris, Quensel. Liebbage-chiari. The best are said to be taken off the Calf in 50 fathoms of water, and run to 8 and 10 lbs. the pair.

S. lascaris, Risso. Lemon sole.

Salmo salar, Linn. Salmon, Braddan. Decreased much of late from various causes, *e.g.*, the lead mines at Laxey and Foxdale, destruction of fry and of spent fish, &c. Salmon up to 32 lbs. have been taken off Maughold Head.

S. trutta, Linn. Varieties, *S. albus*, Walb. White Trout. *S. cambricus*, Don. Sewen.

S. fario, Linn. Trout, Breac. Very small, about 3 oz. being the average. The largest I have seen was at Tholt y Will, and measured 18 in., weighing about 1½ lb. This was April 6, 1885; it was a spent fish.

Belone vulgaris, Flem. Garfish. A local name is Snipe-fish. Not uncommon with mackerel in July.

Clupea harengus, Linn. Herring, Sceddán. For years past there has been a falling off in the Herring fishery, ascribed in part to the breaking up by trawlers of the coral spawning grounds.

Anguilla vulgaris, Turt. Eel, Astan. The Heron is known by the appropriate name of Cor-ny-astan, *i. e.*, eel-spearer.

Conger vulgaris, Cuv. Conger, Astan-varrey.

Syngnathus acus, Linn. Greater Pipe-fish, locally known as "scaled-eel." Not uncommon. I have had the males in May with the pouch full of eggs, about 1-20 in. diameter.

* It had been taken by a net close to the shore. See 'Sixth Annual Report of the Liverpool Marine Biology Committee,' p. 44.

Nerophis æquoreus, Kaup. Ocean Pipe-fish and Snake Pipe-fish, Couch. Forbes mentions *Syngnathus æquoreus*, which no doubt will be this. He adds *S. ophidion*, which may be,—

N. ophidion, Kröyer. Straight-nosed Pipe-fish, Couch. I have not yet come across it.

Orthogoriscus mola, Bl. Schn. Sun-fish. Forbes mentions this also, and I think it is on his authority Mr. Crellin includes it. I have not heard of it otherwise.

Accipenser sturio, Linn. Sturgeon, East-varrey. Rarely taken. In August, 1885, one was trawled off the Bahama bank; it measured over 6 ft., and weighed 210 lbs.

Carcharias glaucus, Cuv. Blue shark. Mr. Garner saw one which was taken in Douglas Bay. ('Holiday Excursions of a Naturalist,' p. 83.)

Mustelus vulgaris, Müll. Smooth hound, Bock glass.

Scyllium canicula, Cuv. Rough hound, Gobbag hooill, Blind gobbag. Common.

S. catulus, Cuv. Nurse-hound, or large spotted dog-fish, Gobbag.

Acanthias vulgaris, Risso. Picked dog-fish, locally, Herring dog-fish.

Rhina squatina, Raf. Ind. Monk fish. Rare. Forbes mentions it under the name of *Squatina angelus*, or angel fish. I have known of one taken in the north of the island many years ago.

Raia batis, Linn. Skate, Scarrag. Plentiful.

R. oxyrhynchus, Linn. Long-nosed Skate, Peegagh.

R. clavata, Linn. Thornback Ray.

R. maculata, Mont. Spotted Ray.

Petromyzon fluviatilis, Linn. Lampern and silver lamprey. Couch. In trenches and ditches; not uncommon; of small size.

NOTES AND QUERIES.

MAMMALIA.

"Black Rats."—In the last month's 'Zoologist' (p. 20), Mr. Charles Garnett, of Clifton, states that eleven years ago he saw "a colony" of Black Rats, *Mus rattus*, "in a ditch on Donside, in Aberdeenshire." Might I ask your correspondent if he procured a specimen by which he can prove the correctness of his identification? If he did not, I fear we must conclude that the animals he saw were a colony of the black variety of the common Water-Vole—the *Arvicola ater* of Macgillivray—which, as is well known, is particularly abundant in the ditches and streams of Aberdeenshire and Banffshire. I can call to mind, too, many instances in recent years where this creature has been recorded as the Old English Black Rat, *Mus rattus*—a mistake which one would fain hope will soon become as great a rarity as *Rattus* itself.—WILLIAM EVANS (Edinburgh).

As there is in 'The Zoologist' for last month (p. 19) the record of a Black Rat, *Mus rattus*, I may say that on the s. s. 'Wordsworth,' late of Messrs. Lamport and Holt's line, we killed several of this species. Some were caught in traps and let out for the fox-terrier to kill, one of whom, preferring a watery grave, leapt overboard and was drowned; another climbed down a rope into a boat that was going ashore, but was knocked into the sea by one of the sailors.—M. BURR (Bellagio, East Grinstead).

BIRDS.

The proportion of Adult and Immature Birds amongst Accidental Visitors to the British Islands.—In reference to this question, may I be allowed to quote from a work on the Geographical Distribution of British Birds (p. 15), which is now in the binder's hands:—"The fifth group is a very large one and contains all those waifs and strays which are supposed to have wandered out of their usual track to our shores, some of them being adult birds which have been driven involuntarily out of their ordinary course by storms and contrary winds, but most of them being very young birds who have accidentally joined the wrong batch of migrants, and have thus been led astray on their first trip, or have lost their way in attempting to find it alone on their second trip. These are called 'Accidental Visitors.'" I venture to think that Mr. Cordeaux, in his communication on this subject in the last number of 'The Zoologist' (p. 26), has arrived at a different conclusion simply because the statistics which he quotes are inaccurate. In the first place, very many of the species which he names are regular autumn visitors on migration to Heligoland, and as they do not really come under the category of "Accidental Visitors," the proportion of

adult to immature birds which they show has really nothing to do with the question under consideration. The Shore Lark, *Otocorys alpestris*, and Richard's Pipit, *Anthus richardi*, occur so regularly and in such numbers that Western Europe must be regarded as one of their regular winter quarters, and consequently their evidence cannot affect the question. The Little Bunting, *Emberiza pusilla*, and the Rustic Bunting, *E. rustica*, breed commonly near Archangel, and their natural fly-line to the south is down the Baltic; but probably—like the Shore Lark and Richard's Pipit—they have comparatively recently extended their breeding-range in a westerly direction, and are gradually establishing a western line of migration which is more and more frequented every autumn. They can scarcely be regarded as accidental visitors to Heligoland, and their evidence on the question under adjudication must be ruled to be out of court. In the second place, what does Mr. Cordeaux mean by the term "immature birds"? Of course he includes young in first plumage. Young in first plumage of the various species of *Limicola* appear by thousands on Heligoland, but there is no instance of any bird belonging to the *Turdinæ* (as defined by Mr. Oates and myself) appearing on Heligoland in first plumage; for the simple reason that every migratory species belonging to this subfamily always moults before it migrates. We may assume that Mr. Cordeaux includes young in first winter plumage, as he admits *Turdus ruficollis* and *T. fuscatus* in that plumage, but does he include young in first spring plumage? List A consists of 122 birds which have overshot their mark in spring on their migration from their winter quarters to their breeding grounds, and eleven birds which have made the great blunder of migrating north instead of south in autumn. Mr. Gätke admits that the latter are young birds, but he asserts that the former are old birds. I think his assertion that the 122 birds obtained in Heligoland in spring are old birds is incorrect. I have no doubt that most of them were birds of the year—that is to say, birds not a year old, birds which had not yet bred, birds which were making their first journey to their breeding grounds. It would require a very accurate knowledge of the minute differences between the plumage of birds in their first spring dress and of adults to decide the point; a knowledge that Mr. Gätke can have had no means of acquiring, and of which there is, of course, no evidence to be found in his book. "*Turdus varius*, 9 old, no young."—I am inclined to think that Mr. Gätke has never seen an old example of White's Thrush:—when I wrote the fifth volume of the 'Catalogue of Birds in the British Museum' I do not think that I had done so; since then I have seen some hundreds of Japanese examples of this very handsome species, and I find that in most of them the upper parts, the breast, and the flanks are suffused with golden buff; and the pale tips of the lesser wing-coverts and the peculiar *Geocichline* markings on the inner webs of the primaries are buff. Such I take to be birds of

the year. Other examples are more olive on the upper parts; there is very little buff on the breast and flanks; and the pale tips of the lesser wing-coverts and the peculiar *Geocichline* pattern on the inner webs of the primaries are pure white. These I take to be adult birds, which seldom, if ever, wander to Europe. I have no doubt whatever that if birds which are not accidental visitors be excluded, and birds of the year be regarded as immature, the evidence of Heligoland will be found to agree with that of the British Islands in favour of the theory that the greater number of Accidental Visitors are immature.—HENRY SEEBOHM.

Correction of Error.—In 'The Zoologist' (1893, p. 26), I have given "two adult to three young" as the proportion amongst the autumn immigrants. This should, however, be two-thirds young, and read "one adult to two young." The statement, which is based on Mr. Gätke's observations at Heligoland, must be taken as having reference to the common host of and throughout the period, and in no way connected with the composition of separate flocks or partial observations restricted to any special area on the east coast.—JOHN CORDEAUX (Eaton Hall, Retford).

Occurrence of the Carrion Crow in the Island of Coll.—On the 6th of last December I saw and heard a single Carrion Crow, *Corvus corone*, in Coll. I was unable to shoot it, but was not more than a hundred yards from the bird, which was very noisy. There is no authenticated record of this species from either Coll or Tiree, though Messrs. Harvie-Brown and Buckley mention, in 'Fauna of the Inner Hebrides' (p. 89), that it has been reported from Tiree: a report, I fairly own, I did not credit till I personally saw one in Coll. It may be added that this autumn and winter a great many Rooks visited Coll from Mull; they could be seen coming over in the morning and returning in the evening, some few, however, remaining to roost.—L. H. IRBY (Army and Navy Club).

Garganey in Holderness.—I do not think that Mr. Cordeaux has got the right date for the occurrence of the above (see Zool. 1892, p. 424), which has been repeated in the Yorkshire 'Naturalist' under the same date—*i. e.* Sept. 19th. I saw a young Garganey, in the flesh, obtained by one of Dr. Hewetson's party on Sept. 2nd; and I took great pains in stalking a small duck next day, believing it to be another Garganey, but which when shot proved to be only a Teal. So that either Mr. Cordeaux's record is not properly the first for the Humber district or he must have been misinformed as to the date.—H. H. SLATER.

Baillon's Crake in Nottinghamshire.—On February 13th, 1891, the birdstuffer at Retford pointed out to me, on one of his top shelves, a small Spotted Crake, which had been obtained on the river at Bolam, near Retford, some little time previously. Subsequently my brother bought the bird, which has turned out to be a specimen of Baillon's Crake, *Porzana*

bailloni (Vieillot), in somewhat immature plumage. This appears to be the first occurrence recorded for Nottinghamshire.—LEONARD BUTTRESS (Grove, near Retford, Notts).

Lesser Whitethroat in County Durham.—Early one morning, at the beginning of last June, I heard a bird, in the garden outside, whose song was quite new to me. I went out before breakfast to see it, but, though I caught a glimpse of the warbler, I could not identify it, and, although it kept singing constantly, its song only puzzled me as to the species. It proved itself a most difficult bird to observe, as its habit was to sit motionless amongst a clump of green leaves, singing the while, and generally highish up in a sycamore or beech tree. Then, as one approached and peered up, it would at once betake itself to a similar situation, perhaps a hundred yards away. The difficulty of getting a glimpse of it was thus prolonged for nearly a week, although it remained in the garden all the time. We had frequent discussions at home as to what it was. Knowing nothing of its song, and not being able to see the bird, hopes of some rare straggler would enter one's head; eventually, however, it proved to be nothing more than a Lesser Whitethroat. Some of my southern readers may laugh at my want of knowledge of the song and habits of a bird which is so common with them; but the bird is very rare in these parts of our northern counties where I happen to have been: so uncommon is it that, with the exception of a solitary nest found by one of us more than twenty years ago, in a district then uncontaminated by pit-smoke, we have never come across the bird at all. Its song was as new to me as if it had been another Icterine warbler, which turned up and was identified in a garden near Newcastle, some few years ago. Why it is so rare with us I cannot say, but it is my opinion that the Lesser Whitethroat is one of the rarest warblers in the north-east corner of England.—ALFRED C. CHAPMAN (Moor House, Leamside).

[Owing to its somewhat skulking habits, *Sylvia curruca* is liable to be overlooked; but even where sought for, by practised ornithologists, its distribution is apparently capricious, and the reasons are, in many cases, as yet unexplained. Like several other Warblers, this species becomes scarcer as we proceed westward, and Messrs. D'Urban and Mathew evidently do not believe in the positive assertions published in this Journal for 1891 (pp. 273, 309) respecting its nesting in Devonshire. It may, however, be extending its range westward, for, whereas it was first recorded as a breeder in Breconshire in 1886, we find Mr. Swainson writing of it in 1891 (Zool. p. 355) as "pretty evenly distributed in suitable places in the neighbourhood of Brecon"; he also says that it is rather common in South Shropshire. Of the southern, eastern, and midland counties we may say, broadly, that the species is tolerably abundant, though trustworthy local details are much to be desired; while "generally distributed, though in

varying numbers," was the summary—doubtless correct—for the huge county of Yorkshire, in 1881. To Cheshire and Lancashire the Lesser Whitethroat appears to be a regular visitor in small numbers, and it breeds sparingly in "Lakeland"; but on the east side of the "divide" it becomes very rare, as we see, in Durham; is not authenticated in Northumberland; and, across the Tweed, was unrecorded up to 1888, in Berwickshire (Muirhead). Turning a little south-westward, we have the valuable evidence of Mr. Service as to its sparse distribution in Kirkcudbrightshire, Dumfriesshire, and down by the Borders—showing the line of migration through the Lake district, and there are statements as to its nesting locally up to Stirlingshire, beyond which it is not known to breed. The bird shot by Mr. G. Sim at Aberdeen, in November, 1880, as well as the examples observed by Saxby in the month of September on the island of Unst, in the Shetlands, were probably migrants from Scandinavia, where the species is known to breed up to 65° N. lat.; a migrant was the only Irish specimen on record, obtained off the coast of Kerry on October 1st, 1890; and such, probably, the autumnal visitors recorded by Rodd from the Scilly Islands. The European distribution of the Lesser Whitethroat is essentially easterly; the species being uncommon* in Normandy and Western France; very rare, even on passage, in Portugal; and only becoming recognisable in Spain, either on transit or in winter, to the eastward of the Straits of Gibraltar; in fact, it cannot fairly be called a regular migrant before we come to the province of Valencia, close upon the meridian of Greenwich.—HOWARD SAUNDERS—ED. *pro tem.*]

Cormorant with Parasitic Worms.—Having occasion to examine the stomach of a Cormorant, *Phalacrocorax carbo*, I was surprised to find the interior of the digestive cavity occupied by numerous parasitic worms. Some few of these were detached, but the majority adhered in bunches to the walls of the stomach. These worms measure about an inch in length, are round in form, and often carry a single black stripe. Is it probable that these worms had been transferred to the digestive cavity of the Cormorant from the interior of a flounder or other fish "host"?—D. L. THORPE (Carlisle). [Communicated by the Rev. H. A. Macpherson.]

Addition to the Birds of Donegal.—Mr. H. C. Hart, in his note on this subject (p. 22), omits one bird that, as far as I am aware, has not before been recorded in his lists—namely, the Fulmar, *Fulmarus glacialis*. In the 'Irish Naturalist' for July, 1892, I notified the occurrence of this bird in Co. Donegal. The specimen, which was a well-defined example of the grey-breasted form, I picked up on the sands between Ballyshannon and Bundoran.—H. LYSTER JAMESON (Loughgilly, Co. Armagh).

FISHES.

Weight of Trout.—The following note, on account of the date of capture, may be of interest. At Walsingham Abbey, Norfolk, the seat of H. Lee Warner, Esq., there hangs the picture of a Bull Trout, evidently painted to scale, with the following inscription:—"Taken at Fordwick, in Kent, in the year 1672, weigh'd 27 Pounds. This is the representation of a Trout, which was given in 1672, to Henry Lee, Esqr., of Danejon. near Canterbury, for which city he was then Member of Parliament, and was so in seven successive Parliaments, and in one for Hindon."—H. W. FEILDEN.

INSECTS.

Sirex gigas and Colias edusa in Holderness.—A specimen of *Sirex gigas* was given to me one day at the end of last July. Probably to be accounted for by the Hull timber-yards. *Colias edusa* was very plentiful in South Holderness. I saw as many as twenty-five in a day. Two examples of var. *helice* were seen, and one captured.—H. H. SLATER.

 SCIENTIFIC SOCIETIES.

LINNEAN SOCIETY OF LONDON.

General Meeting, Jan. 19, 1893.—Prof. CHARLES STEWART, President, in the chair.

After the confirmation of the minutes, the President referred in suitable terms to the losses sustained by biological science in the deaths of Sir Richard Owen and Prof. J. O. Westwood, who had been Fellows of the Society for fifty-six and sixty-four years respectively.

Mr. George Brook showed photographs of Corals which he had lately taken, and had reproduced by permanent-process at a cost below lithography, with the added advantage of permitting amplification by a hand lens.

The President read a paper on the auditory organ of the Angel Fish, *Rhina squatina*.

Mr. W. Carruthers then laid before the Society the results of a collection made by Mr. Alexander Whyte in the Malanji country, in the Shire Highlands, in October, 1891, and the plants were determined by the officers of the Botanical Department, British Museum, about sixty—or roughly speaking one-fifth—proving new to science. Whilst Sir J. D. Hooker defined the flora of Kilimanjaro as Abyssinian in character, the Malanji flora displays a much closer relationship to the Cape.

The last paper was by Mr. G. F. Scott Elliot, and was his report as botanist to the Anglo-French Sierra Leone Boundary Commission, in which he gave an account of the economic aspects of the districts traversed.

ZOOLOGICAL SOCIETY OF LONDON.

Jan. 17, 1893.—Sir W. H. FLOWER, K.C.B., LL.D., F.R.S., President, in the chair.

The Secretary read a report on the additions that had been made to the Society's Menagerie during the month of December, 1892.

Mr. F. C. Selous exhibited and made remarks on the head of a hybrid Antelope between the Sassaby, *Bubalis lunata*, and Hartebeest, *B. caama*; also a head of a female Koodoo, *Strepsiceros kudu*, with horns and heads of some other South-African Antelopes.

Mr. O. Thomas exhibited some examples (from the Baram River, Sarawak, collected by Mr. Hose) of the Monkey that he had lately described as *Semnopithecus cruciger*, and stated that, in spite of the confirmation afforded by these specimens, Mr. Hose thought that this species might possibly be only an erythrism of *S. chrysomelas*.

A communication was read from Mr. E. Y. Watson, entitled "A proposed classification of the *Hesperiidæ*, with a revision of the Genera." This contained a preliminary classification of the *Hesperiidæ*, including the numerous modern genera, which were arranged under three subfamilies according to the sexual differences, the resting posture, the antennæ, the spurs on the hind tibiæ, and the position of vein 5 (relative to veins 4 and 6) of the fore wing. The subfamilies were named *Pyrrhopyginæ*, *Hesperiinæ*, and *Pamphilinæ*, and the two last were subdivided into sections without names. In all 234 generic names were dealt with, of which 49 were treated as synonyms, while 45 new genera were described. Complete diagnoses were given of all the admitted genera.

A communication was read by Mr. E. E. Austen, entitled "Descriptions of New Species of Dipterous Insects of the family *Syrphidæ*, in the Collection of the British Museum, with Notes on Species described by the late Francis Walker." This communication contained descriptions of twenty-three new species belonging to the division *Bacchini*, and of one belonging to the *Brachiopini* (genus *Rhingia*). An attempt was made to divide the genus *Baccha*, as at present existing, into three groups, based chiefly upon the shape and markings of the abdomen. The true position of the remarkable genus *Lycastrihyncha*, founded by Bigot on a species from Brazil, and afterwards cancelled by its author in favour of *Rhingia*, was established. It was shown that this genus had nothing to do with *Rhingia*, but was one of the *Eristalini*, closely allied to *Eristalis*. It was also shown that the genus *Lycastris*, founded by Walker for a species from India, was not

identical with *Rhingia* (as had been likewise suggested by Bigot), but belonged to the *Xylotini*, and was allied to *Criorrhina*.

A communication was read from Mr. Gilbert C. Bourne, containing descriptions of two new species of Copepodous Crustaceans from Zanzibar, proposed to be called *Canthocamptus finni* and *Cyclops africanus*.

Mr. Sclater exhibited and made remarks on the typical specimens of a rare Argentine bird, *Xenopsaris albinucha*, described by the late Dr. Burmeister in 1868.—P. L. SCLATER, *Secretary*.

ENTOMOLOGICAL SOCIETY OF LONDON.

January 18, 1893. — *The Sixtieth Annual Meeting*. — FREDERICK DUCANE GODMAN, Esq., F.R.S., President, in the chair.

An Abstract of the Treasurer's accounts having been read by one of the Auditors, the Secretary, Mr. H. Goss, read the Report of the Council.

After the ballot it was announced that the following gentlemen had been elected as Officers and Council for 1893:—President, Mr. Henry J. Elwes, F.L.S.; Treasurer, Mr. Robert McLachlan, F.R.S.; Secretaries, Mr. Herbert Goss, F.L.S., and the Rev. Canon Fowler, M.A., F.L.S.; Librarian, Mr. George C. Champion, F.Z.S.; and as other Members of the Council, Mr. C. G. Barrett, Mr. Charles J. Gahan, M.A., Mr. F. DuCane Godman, F.R.S., Mr. Frederic Merrifield, Mr. Osbert Salvin, M.A., F.R.S., Dr. David Sharp, M.A., F.R.S., Colonel Charles Swinhoe, M.A., F.L.S., and Mr. George H. Verrall.

The President then delivered an Address, which, though containing reference to the Society's internal affairs and an allusion to the successful resistance made by naturalists and others to the War Office scheme for establishing a rifle range in the New Forest, consisted for the most part of full obituary notices of Fellows of the Society who had died during the year, special mention being made of Mr. H. W. Bates, F.R.S., Prof. Hermann C. C. Burmeister, M.D., Dr. Carl A. Dohrn, Mr. H. Berkeley-James, Mr. J. T. Harris, Sir Richard Owen, K.C.B., F.R.S., Mr. Henry T. Stainton, F.R.S., Mr. Howard Vaughan, and Prof. J. O. Westwood, M.A., the Hon. Life-President. A vote of thanks to the President having been proposed by Lord Walsingham, F.R.S., and seconded by Mr. J. H. Leech, Mr. Godman replied.

Dr. D. Sharp, F.R.S., then proposed a vote of thanks to the Secretaries, Treasurer, and Librarian, which was seconded by Mr. W. H. B. Fletcher. Mr. McLachlan, Mr. Goss and Canon Fowler then severally replied, and the proceedings terminated.—H. GOSS & W. W. FOWLER, *Hon. Secretaries*.

NOTES ON SCIENTIFIC MAGAZINES.

THE 'Irish Naturalist' for December contains a paper by Professor J. R. Leebody on the Birds of Lough Swilly, which forms a useful appendix to the series of articles on the "Birds of Donegal" recently contributed to 'The Zoologist' by Mr. H. Chichester Hart and others. The summer frequenters of Lough Swilly are not very numerous, for, except at Dundaff, the sea-fowl do not resort to the cliffs, owing, as the author believes, to the absence of any strong tidal current. His experience is that the parent birds mainly rely on herring-fry as a food supply for their nestlings, and as the "brit" is most plentiful in a strong tidal run, the birds chiefly resort to those cliffs which are in proximity to such conditions. In winter, however, Lough Swilly is a great resort of water-fowl, as the list shows, and flight-shooters often obtain excellent sport. Dr. R. F. Scharff concludes his list of the Irish Land and Freshwater Mollusca, and has identified a small *Planorbis*, obtained by Mr. J. N. Milne at Lough Swilly, as *P. riparius*, Westerlund, a species new to the British Islands, but recorded from Northern Germany, Sweden, and Siberia. In the January number Dr. R. F. Scharff discusses the question of whether the Common Frog is indigenous in Ireland; the Rev. Hilderic Friend commences a series of papers on Earth-worms; and the Macro-Lepidoptera of the Londonderry district are enumerated by Mr. D. C. Campbell.

The January issue of that excellent quarterly magazine, 'The Annals of Scottish Natural History,' has some further particulars of Risso's Grampus, near Annan, by Mr. Robert Service, a notice of which appeared in 'The Zoologist' for 1892 (pp. 404, 405). Mr. J. A. Harvie-Brown gives an interesting account of two visits to the southern portion of the Shetland Islands,—a district little known to ornithologists, who usually betake themselves to the northern and western islands in search of the bird with which the Shetlands are especially identified, namely, the Great Skua. The experiences of Saxby, the great authority on the group, were, in fact, almost confined to Unst, and comparatively few naturalists have explored the comparatively tame country of the south, in spite of the glamour which is associated with Sumburgh

and Fitful Head. This district is, however, crossed by the fringe of an important line of migration; the Wryneck passes there, and the Bernacle Goose—till now only recorded as a rare straggler—resorts in numbers every autumn to the Quendale sandhills. Of the Spotted Crake Saxby wrote, “not in Shetland,” and only two are recorded (on the October passage) in Saunders’s ‘Manual’; but now we learn that the species is not uncommon in the south, though it is only to be found with the assistance of a dog, and its existence in Mousa was not suspected until 1891, when three were obtained by this means. Mr. Harvie-Brown thinks that some unusually large and heavy Snipe, which arrived towards the end of September, were probably *Gallinago major*, a species not yet identified, we believe, in the Shetlands. Dr. Traquair describes and figures an unusually coloured example of the Thornback (*Raia clavata*, Linn.), and Mr. W. Anderson Smith contributes notes on a very rare and interesting species of Starfish (*Astronyx loveni*, Muller), from 90 fathoms in the Sound of Sleat, and only once obtained previously in Scottish waters. Readers of the articles in ‘The Zoologist’ on the distribution of the Polecat will be interested to learn that several individuals have been taken at Lochinver; there are notes on the misdeeds of Voles, as might be expected at a time when they are deemed worthy of a nothing less than special Government Commission to Greece; evidence that the Ring Ouzel sometimes remains during the winter in the mild climate of Galloway is adduced by Mr. Robert Service; a Jackaw’s nest in the main-topmast head of the training-ship ‘Empress’ is described by Mr. Jas. Lumsden; and there are many other interesting notes.

ERRATA.—Page 37, line 2 of the review, for “Hartwig” read “Hertwig”; line 5, for “Hussey” read “Hersey”; line 9, for “entomologists” read “embryologists.” Page 38, line 6, for “Iris” read “His”; line 20, for “langers” read “layer”; line 28, for “Mitsukwi” read “Mitsukuri.”

THE ZOOLOGIST.

THIRD SERIES.

VOL. XVII.]

MARCH, 1893.

[No. 195.

NOTES ON THE SEAL AND WHALE FISHERY, 1892.

BY THOMAS SOUTHWELL, F.Z.S.

THE Newfoundland Sealing in the season of 1892 has again proved successful; 349,369 seals were taken by twenty vessels, as compared with 343,495 by nineteen vessels in the season of 1891; in addition to which some 25,000 more were killed by schooners in the Gulf of St. Lawrence. Of this large number 40,678, the great bulk of which would be old seals, were taken on the second trip, about which I shall have more to say further on. Eight vessels secured more than 15,000 each, the 'Diana' taking the lead with the enormous number of 40,904; followed by the 'Ranger,' 34,614; 'Esquimaux,' 33,968; 'Wolf,' 32,479; 'Ice-land,' 25,288; 'Eagle,' 20,819; 'Nimrod,' 18,669; and 'Labrador,' 18,623. The remaining twelve vessels were fairly well fished, only two having less than 7000; the average of the first eight was 28,170, and of the remaining twelve 10,334 seals. The 'Board of Trade Journal' (August, 1892, p. 214), quoting from the 'Montreal Gazette,' estimates the total catch of seals in Newfoundland by both steam and sailing vessels at 398,624 (say 400,000), which, at a valuation of 2.50 dols., would represent a value of £250,000.

The 'Eclipse' of Peterhead was at the Newfoundland sealing under the command of Capt. Guy, late of the 'Polynia,' which was lost in Davis Straits last season, but owing to an accident to her machinery had a very unsuccessful voyage, securing only 3595 seals.

The St. John's 'Evening Telegram' of the 26th April gives an account of the second trip of the 'Diana,' and estimates her catch of 12,657, mostly old ones, to represent an equivalent of some 30,000 young seals; she actually killed 3000 more than she could stow away, being only a vessel of 290 tons, and these were brought home for her by the 'Falcon.' The only catch I can call to mind which exceeded that of the 'Diana' was made in 1888 by the 'Neptune,' a vessel of 465 tons, which brought home 42,242 seals for one trip. In my notes for 1884 I made some remarks on the objectionable practice of making second trips, especially in the case of vessels already well provided, and there seemed at that time a tendency on the part of the owners to discountenance the practice; it was agreed to close the fishery on the 26th of April, instead of continuing it till the end of May, and this arrangement has, I believe, been adhered to. Let us, however, follow the 'Diana,' as reported in the St. John's paper already referred to and see what is the result of continuing the fishing even as late as the 20th of April. This, it must be remembered, was her second trip, she having already killed 28,247 seals. On the 28th March the Captain put his gunners on the ice, and took the handsome number of 1800 *old* seals. "On the 30th they struck another small patch of seals, and took 2000, and at still another place captured 200 more." On April 12th seals were again met with, estimated to number some 60,000; later in the day all hands went on to the ice, "and in less than three hours the battle was won, to the tune of three cheers, fully 10,000 seals lying as they were slain on the ice. . . . It was midnight, and after snatching their well-won repose, the crew were on the ice at daylight, each one bearing a knob of coal and an allowance of provisions. They were followed by a detail of cooks and stewards, who prepared meals on the ice. The work of sculping and panning the seals went on through the day At 6 p.m., the flags of the ship flying over each pile of seals, covering an area of a square mile. . . . At 2 p.m. on the 20th the steamer was loaded below and on deck with 12,400 *old* seals." "Our informant," proceeds the St. John's 'Evening Telegram,' "of these details—the best authority on board the 'Diana'—is frank and honest enough to say that these seals were all breeding seals; and in an outspoken spirit he admits that they were killing the goose which lays the golden eggs. 'Second trips,' he adds,

should be stopped, and no old seals should be killed after the 15th of April. If not, it is the fishermen of the island, and their children after them, who will have to suffer the loss resulting from the present reckless custom.'” The ‘Esquimaux’ killed 16,000 seals in her second trip, having already killed 17,968.

On the whole, the Greenland young sealing was fairly successful, but the good luck fell almost entirely to the Norwegian vessels, which were early in the field and found the seals before the close-time came to an end; they were thus ready to commence as soon as the law permitted, and secured about 60,000 seals, or double the catch in Greenland for some years past; but frost set in, and the Scotch vessels were unable to reach the breeding packs, except the ‘Balæna,’ which, after lying beset for a week, was liberated on the 3rd of April, and reaching the pack the same day, managed to secure some 2100 young and old seals, although they had a long way to travel over the ice for them. Only 3478 seals were brought home from Greenland by the Scotch vessels, and 8618 were collected by the ‘Alert’ from the Cumberland Gulf stations. The severe frosts which have prevailed in the past few springs have been beneficial to the breeding seals, enabling an unusual proportion of the young ones to escape and thus strengthen the breeding pack.

Eleven Scotch vessels took part in last season’s sealing, and captured in Newfoundland and Greenland 74,449 young and old seals (including 8618 from Cumberland Gulf); of these 62,353 were from Newfoundland, the bulk of which were included in the total for that division of the fishery already given. These produced 827 tons of oil (as against 90,590 seals and 986 tons of oil in the previous season), which at £20 per ton for oil and, say, 5s. per skin, represent a sum of £35,152, as against an estimate of £47,444 in 1891. It will be observed that the success of the venture is again due to the Newfoundland voyage.

The Davis Straits whaling was only a partial success; of the four Dundee vessels present, the ‘Aurora’ captured two fair-sized whales, yielding $20\frac{1}{2}$ cwt. of bone; the ‘Esquimaux’ one very small whale of $1\frac{1}{2}$ cwt. of bone; the ‘Terra Nova’ one good whale of 15 cwt. of bone; and the ‘Nova Zembla’ missed the black fish, and had to be content with 318 White Whales, 14 Narwhals, 3 Walrus, and 2 bears, whilst the best-fished vessel of all, the ‘Maud,’ which was instrumental in saving the crew of the ‘Polynia’ in Admiralty

Inlet last year, herself fell a victim to the ice in Coutts' Inlet, having at the time on board the products of three large whales, estimated to produce 55 tons of oil and $2\frac{3}{4}$ tons of bone, besides 105 Seals, 40 White Whales, 56 Walrus, and a number of Bears and Narwhals, the whole valued at between eight and nine thousand pounds; happily the crew were rescued and the produce was insured. In addition to the seven Right Whales, 1309 White Whales and Narwhals, 67 Walrus and one Bottle-nose were killed. The captain of the 'Aurora' reports that, after spending a fortnight at the south-west fishing-grounds without success, the ice being too far to the eastward, his only capture being one Bottle-nose, he proceeded to the northern fishing-grounds, where three whales were seen, but could not be approached in consequence of the large quantities of ice; he therefore proceeded to the head of the Cumberland Gulf, where he secured 340 White Whales. He then once more tried the northern fishing, and again several whales were seen, but the sea and weather were so bad that it was not till the 23rd October he had any success. On that day both he and the captain of the 'Terra Nova' succeeded in capturing a whale each; on the 30th he again met with whales and his second fish was secured. On the 4th November he bore up for home, arriving at Dundee on the 22nd.

The voyage of the 'Nova Zembla' was an interesting one, if not so successful as that of the 'Aurora.' She left Dundee on the 19th March, and after a very stormy passage made the ice about forty miles south of Resolution Island on the 14th April. Thick foggy weather prevailed, and as there was no prospect of success in the south Capt. Cunningham left for the north, reaching Prince Regent's Inlet on the 19th June, and the floe being in good condition, although the weather was very unsettled, he remained there till the 16th July. The first whale was seen on the 27th June, and for the next fortnight the boats were in pursuit almost daily, but the foggy weather rendered success impossible. On the 16th he proceeded to Admiralty Inlet, where whales were again seen, but the weather was so heavy that it was impossible to lower the boats. Returning to Lancaster Sound, a strong easterly gale drove the vessel up Barrow Strait to within twenty miles of Beechy Island. On the 12th August Elwin Bay was reached, and notwithstanding the heavy ice 100 White Whales were taken, and on the following day 200 more

were secured. During September few whales were seen, and none in such a position as to render pursuit possible.

On the 6th October, off Cape Eglinton, the 'Nova Zembla' came upon a great school of whales proceeding rapidly southwards; the boats were out from morning till dark, and the steamer followed them thirty miles without success, the weather being very bad. On the third day after, the whales were again overtaken off Cape Kater, but for three days the storm raged and snow fell heavily; when the weather moderated the whales could not be seen. During the following week several other whales were sighted at a great distance, going south rapidly, and on the 15th October the 'Nova Zembla' started on her homeward passage, taking in her last lines on the 26th, and reaching the Tay on the 17th November. I quote the brief outlines of these two voyages, as they indicate the usual course taken by the Davis Straits whalers, the difficulties and disappointments they too frequently meet with, and how, notwithstanding whales being seen in plenty, even a skilful commander may be compelled by adverse circumstances to return with a clean ship.

In the past year there were five vessels in the Greenland Sea, all from Dundee, the port of Peterhead being quite unrepresented. Since the year 1857, when Peterhead sent out thirty-two ships (all but two to Greenland), which returned with twenty-one whales and 74,357 seals, the trade from that port has gradually declined, till at present the 'Windward,' which was laid up last season and is now for sale, is the only whaling vessel belonging to Peterhead owners, the brig 'Alert' being only a carrier. The 'Hope' and the 'Eclipse' have been sold, the latter to replace the 'Maud' at Dundee; and the 'Perseverance' has been sent out on a new venture, I believe by the Hudson Bay Company, to winter in Repulse Bay. Should the 'Windward' not go out next year, which is highly probable, the Whale Fishery will have come to an end there, the only hope for its resumption being the better times which have been so long waited for; but the busy scenes which witnessed the fitting-out and departure of thirty-two vessels manned by more than 1000 hands, will never be repeated in the Peterhead Docks.

The retirement of Capt. Gray marks the closing epoch in the history of the Peterhead fishery, and for the first time since 1811 the arctic seas of either Greenland or Davis Straits have remained

unvisited by one or more members of this family. In 1811, David Gray the elder commanded the 'Perseverance' in the Greenland Fishery, making his last voyage in 1827. In 1825 he left his ship, the 'Active,' frozen up in Davis Straits, and in the next season brought her safely home, a feat I have never heard of being repeated. In 1836 his son, John Gray, who had previously sailed from Kirkcaldy, took command of the 'Eclipse,' in which he made twenty voyages, dying in 1856. His sons, David, John, and Alexander, all commanded whalers. John died in 1892; Alexander is now in the Hudson's Bay service; and David, who made his first voyage as Commander in the 'North of Scotland' in 1849, till 1892 had spent every summer in the arctic seas, having captured 197 whales and 168,956 seals. Capt. Gray's eldest son accompanied his father several years, but has now forsaken the sea for the medical profession, and with the last Gray I fear this once thriving industry, which his family has done so much to promote, so far as his native port of Peterhead is concerned, has virtually come to an end. With the exception of Dr. Scoresby, no whaling captain has brought so much intelligence to bear upon his profession as Capt. David Gray. Science is indebted to him for many facts elucidating the habits and structure of the Right Whale and the Hyperoodon, and humanity owes him a deep debt of gratitude for his successful efforts in establishing a close time for seals, by which he was mainly instrumental in abolishing, I trust for ever, the most cruel features of this occupation; and his son, Dr. Robert Gray, has closely studied the habits and anatomy of the animals which he has met with in the arctic seas, and I hope will some day make a good use of the results of his observations.

The Greenland vessels were the 'Active,' which captured one whale; the 'Balæna,' two small whales; the 'Diana,' clean, with the exception of 148 seals; the 'Polar Star,' with only 449 seals' and the 'Chieftain,' which was nipped in the ice and abandoned on the 14th July. The 'Eclipse' was absent from the whale fishery. The season is described as very bad, strong N.E. gales prevailed, great quantities of ice, and continuous fogs; very few whales were seen. The Captain of the 'Diana' says:—"The voyage may be summed up by saying that when fish were seen the ice and weather were unfavourable, and when the conditions were suitable no whales could be sighted." Happily, the crew

of the 'Chieftain' were rescued and brought home by the 'Diana' and 'Balæna,' and thus loss of life was not added to the other misfortunes.

The question which naturally suggests itself is—What is the reason of this want of success? My friend, Dr. Robert Gray, attributes it to the comparative scarcity of whales in the Greenland seas; not that they are extinct, but they have become so few as to render their pursuit unremunerative, a condition long predicted. There may be many whales in the Greenland sea even now, but the sea is of vast extent, and the circumstances attending the search for them are so arduous that it is probable very few, even of those which may come within range of the ship, will be perceived, owing to atmospheric conditions, or the unfavourable state of the ice. Added to all this, the eagerness with which they are hunted, and the disturbing influence of steam, have made the whales so timid that they are extremely difficult to approach, and even when found they escape much more frequently than formerly. There is thus reason to hope that the numbers of these grand animals may not be so reduced as to endanger their final extinction.

The produce of the Whale Fishery of the past season was 10 Whales, 1309 White Whales, and 67 Walrus; the 'Alert' also brought home on freight one whale and 8613 seals, collected at the several fishing stations in Cumberland Gulf. These yielded 298 tons of whale-oil (about 180 tons of which was White Whale oil), and 5 tons 14 cwt. of bone, which valued at, say, £22 per ton for whale-oil and £2300 per ton for bone (of all sizes), represent a sum of about £19,666, against £26,000 in the previous season.

A very interesting feature in the Whale Fishery has been the capture by the Norwegian vessels of several individuals of the rare *Balæna biscayensis* to the south of Iceland, in the years 1889-91. I believe this species has been occasionally met with by the American whalers in the same locality, before going into Cumberland Gulf, but it is difficult to obtain accurate information. On asking Prof. Collett for particulars, he very kindly informed me that in 1889 one specimen was caught; in 1890, six (the skull of one of which is now in the Christiana Museum); in 1891 ten were secured; and during the past season (1892) the search for them proved unsuccessful, although several whalers were on the look-

out. Prof. Collett also refers me to a paper on the subject by Prof. Guldberg in 'Forhandlinger Videnskabs-Selskabet' (Christiania, 1891, No. 8), which I have not been able to see. Capt. Gray told me that he saw two heads of bone of this species in London, which he was told came from Norway, but which doubtless formed part of the above captures. This occurrence is of very great interest, as showing how this Atlantic species, believed not long since to be all but extinct, still lingers on, and continues to visit the same winter quarters in which it formerly abounded at that season of the year; but it is to be feared that the small "school" found by the Norwegians in 1889 has been exterminated.

The year 1892 also marks what may prove a new era in the Whale Fishery. In my last year's "notes" I mentioned that it was contemplated to send out an expedition to the borders of the antarctic ice; four vessels,—the 'Active,' 'Balæna,' 'Diana,' and 'Polar Star,' from Dundee; and one Norwegian actually started in September last. On the 11th December the last of the pioneer fleet reached the Falkland Isles, and ere this the problem is most likely solved. So little is known about the Right Whales of the antarctic seas that the voyage can hardly fail to have considerable scientific interest, although I am not aware that any competent naturalist has joined either of the vessels, but the surgeons will, it is stated, interest themselves in collecting such specimens of the fauna as come within their reach. As to commercial success, everything depends upon the quality of the whalebone met with; if it is expected that a species will be found at the antarctic ice corresponding with *B. mysticetus*, I fear such an animal has yet to be discovered; but the bone of *B. australis*, although short, is reported to be fairly good. *Neobalæna marginata* will also probably be met with, but would be of still less commercial value; however, the venture is a bold one and fully deserving of all the success with which we hope the enterprise may be attended.

SUPPLEMENTARY NOTE.—Letters have been received from the Dundee Antarctic fleet, dated Falkland Islands, December 9th, 1892. Three of the vessels, the 'Balæna,' 'Active,' and 'Diana,' arrived at Port Stanley, the two former on the 8th December, and departed south on the 11th, the 'Diana' heaving in sight as they

left. The 'Polar Star' has also been spoken about the same latitude some time later. All the vessels experienced very heavy weather after leaving Dundee, and it was twenty-one days before the 'Balæna' got clear of the Irish coast; the rest of the voyage was very favourable, the passage from Dundee being made in ninety-one days. All were well, and anxiously looking forward to the time when the ice would be reached and the business proper of the voyage commenced. The Norwegian steamer 'Jansen' called at the Cape Verd Islands about the beginning of October, since which time she has not been heard of. The Dundee owners are anxiously expecting news of the result of this new venture.

NOTES ON THE ORNITHOLOGY OF NORTHAMPTONSHIRE
AND NEIGHBOURHOOD FOR 1892.

BY THE RT. HON. LORD LILFORD, F.L.S., F.Z.S.

I continue my notes from the end of 1891 (Zool. 1892, p. 210).

JANUARY.

1st. I received a female Tufted Pochard, alive, from the Peakirk decoy.

2nd. The decoy-man brought in fifteen Mallard, twelve Teal, and a female Pintail, alive, from the decoy, and told me that on Christmas-day, and other recent occasions, a Peregrine had been driving the Teal about terribly.

14th. "Black-Duck" reported by one of our gamekeepers as having been seen on flooded meadows near Thrapston.

20th—25th. The falconer tells me that a Water-Rail has been frequently feeding about his cottage-garden during the sharp frost. I have heard of several of these birds about lately, but may add that there is no open water within a considerable distance of the garden above mentioned.

MARCH.

1st. One of the Ruffs in the aviary is rapidly assuming his "show" or neck-frill.

7th. A female Antwerp Carrier-Pigeon that has paired with a Stock-Dove in the aviary hatched two eggs this morning, and

a nest of the latter species in a hollow beech-tree in our pleasure-grounds contained one egg.

9th. Two Little Owls seen in the deer-park, Lilford (*cf.* Zool. 1891, p. 46).

13th. About 160 head of wildfowl on the decoy-pool. Three Whimbrels seen near the decoy. This is a very unusually early appearance of this species in our neighbourhood. Two small trips of Golden Plover were observed near the same spot as these long-billed travellers.

25th. A Tawny Owl's nest with four eggs in old elm in our deer-park. From five to seven Canada Geese frequented our meadows during the last fortnight of the month (*cf.* Zool. 1891, p. 45).

30th. Young Blackbirds well feathered in a nest at Thorpe Waterville.

APRIL.

1st. The first Peewit's eggs of the season brought in.

4th. Pied and Barred Woodpeckers very busy about the old trees on our pleasure-ground.

8th. A Jack Snipe hangs on at the decoy.

14th. Three Woodcocks seen in one of our woods.

17th. Many Fieldfares and some Redwings passing to the N.E.

19th. A nest of Little Owls, containing four eggs, was discovered in a hollow stump of ash on Wadenhoe Manor.

24th. Mr. W. J. Horn informed me that on this day he positively identified a grey-backed or so-called *White* Wagtail at Kingsthorpe, near Northampton. I do not think that this race of Pied Wagtail is very uncommon in our county, but this is the first *certain* record of its occurrence therein that has come to my knowledge.

25th. A nest of Long-eared Owl containing five eggs was found in a fir plantation just outside the park by one of our gamekeepers. This Owl, though not uncommon in certain parts of Northamptonshire, is decidedly a rare bird in the immediate neighbourhood of Lilford, and this is the first nest that I ever heard of on my own property. The man who found this nest assured me that an Owl of some sort flew out of a tree close to the nest, and that on climbing up to it he found the eggs quite cold, and one of them slightly cracked. He watched the nest

for some days, but could neither see an Owl upon it or flying from it, although one was generally in a neighbouring tree; so, after some days, having my doubts of correct identification, I told him to go up and examine the nest again, and if he found the eggs cold to bring them with the nest to me: he did so. The nest was, I think, the old cup of a Magpie's nest, to which the Owls had added a flat outside border or rim of larch-twigs; the eggs were undoubtedly those of *Asio otus*, and I believe that the injury to one of them, mentioned above, had been caused by the teeth of a Squirrel. One—and occasionally both—of the parent-birds remained in the immediate neighbourhood of their nesting-place for some time, but I could not hear of their nesting again. This is the first year in which I have positive proof of the nesting of four species of my favourite birds in our county in complete liberty. Three Partridges' eggs, first of season, found to-day near Achurch.

26th. Miss F. Wickham, who was staying with her brother at Cotterstock, was kind enough to drive over and bring me a very fine adult Gannet that had been picked up alive near Warmington on the previous day, and died in the night. This bird had no trace of any injury about it, and though poor in flesh was by no means emaciated. The above is not the first occurrence of the species in question in our county that has come to my knowledge, but is the first Northamptonshire specimen that I have seen, and a very valuable acquisition to my local collection. I must not omit an expression of gratitude to Mr. J. Crisp, of Elton, the finder of the bird, who at the request of Miss Wickham most obligingly gave the bird to her for me. Three large gulls reported as "passing northerly."

30th. My Bitterns in the aviaries commenced "booming." I may mention that a pair of these birds nested last spring in a very small compartment in our court-yard, where they were constantly exposed to the observation of frequent passers by; four eggs were laid, and one bird sat very steadily, but without result.

MAY.

1st. A Snipe was flushed from an old rushy gravel-pit on Achurch, but in spite of diligent search the next day by the falconer, no nest was found; however, on the 4th our butler

found a nest containing two Snipes' eggs, with a third lying sucked at a short distance in this pit. I had for many years felt convinced that Snipes occasionally bred near Lilford, but this is the first positive proof of the fact that has come to my knowledge.

6th. Mr. W. J. Horn informed me that on this day he observed between thirty and forty Great Crested Grebes on the Ravensthorpe Reservoir.

8th. A considerable flock of Fieldfares reported by a friend who was staying with us as seen near Thorpe fox-covert.

16th. I received a letter from one of my neighbour Lord Lyveden's gamekeepers, informing me that he had seen a Woodcock at Farning Woods on the 2nd inst. This is a late date for this bird in our neighbourhood; but in spite of diligent search, no eggs or young of Woodcock were discovered in our district this summer. I received a letter (at the kind suggestion of Dr. Albert Günther) from Mr. C. Hampden Wigram, who was good enough to inform me that, on the 2nd inst., he had clearly identified a Kite at a very short distance from a train on the Great Northern Railway, close to Holme Station. Holme is not in our county, though very near to its confines, but my principal reason for recording this occurrence is that the great woods in that district were famous for the numbers of Kites that frequented them up till about 1846.

18th. A nest of Long-tailed Titmouse was found in what, in my experience, is an unusual locality—the bough of an old oak, at about fifteen feet from the ground. Another nest of this species discovered, about this time, was built at not more than about a yard from the ground in a thick box-bush close to a path in one of our home-coverts.

20th. A nest of Barred Woodpecker, containing five eggs, was found in an old whitethorn on our pleasure-grounds at Lilford. I mention this, as, although this Woodpecker is abundant with us, we have very seldom hitherto succeeded in finding its nest. We have at least seven occupied nests of Hawfinches in what I may call our "curtilage" at Lilford, where till this autumn I had never known of more than two or three in any one season.

JUNE.

1st. My friend Mr. Charlton, of Geddington, informed me that he had very recently found a nest of the Common Sandpiper, containing eggs, near that place. Although this bird is common with us on both passages, and I have good previous evidence of its breeding in our county, the present is the first record of the finding of its eggs therein that has hitherto reached me (*cf.* Zool. 1891, p. 47).

2nd. First record of the Hobby this season, seen close to the house at Lilford; another, or perhaps the same individual, was seen soaring over our court-yard, on 15th inst., by the falconer and a lady to whom he was showing my living collection; their attention was called to this little falcon by the skyward gaze of Eagles, Kites, and other of my captive raptorial birds.

JULY.

1st. A wild Peregrine was "toying" in the air with three youngsters of the same species that are "at hack" in front of the house at Lilford.

9th. I was informed by the Wadenhoe gamekeeper that a few days ago one of the tenant farmers on that manor was attacked from behind, and had his hat knocked off by a Little Owl as he passed close to the nesting-place mentioned above (*cf. supra* April 19th).

19th. I received a moulting Dunlin, in the flesh, killed yesterday at a pond in the manor of Clapton. I need hardly say that this is a very unusual time for the occurrence of this species in our district.

25th. A vast congregation of Bank-Martins about the river near Lilford.

AUGUST.

1st. A solitary Wigeon dropped on to the decoy-pool.

3rd. I noticed a Tern that from its size must, I think, have been either a Sandwich or Gull-billed Tern, passing southwards up our valley at a great height. I am positive that this bird was neither a Common nor an Arctic Tern, but it was too far from me for certain identification.

4th. One Teal at the decoy.

6th. A solitary female Shoveller at the decoy.

7th. First report for the season of Green Sandpiper.

12th. A bird seen about the river above Lilford several times, and minutely described to me by two persons well acquainted with all our common species, can be nothing but a Greenshank, a very rare bird in this part of Northamptonshire. Our common river-side warblers are in very great abundance; we see a few more Water-hens than in last summer, but Kingfishers are lamentably scarce. Mr. O. V. Aplin informed me of pretty positive evidence of the breeding of Great Crested Grebes this summer on Byfield Reservoir.

14th. Our Rooks, which have been, as usual, to a great extent absent from their haunts hereabouts since the end of June, are returning daily in great numbers. Song Thrushes collecting in flocks about the willow-holts on the river.

19th. Tawny Owls hooting constantly at mid-day.

20th. Pied Woodpeckers very restless and noisy near the boat-house at Lilford.

31st. A Manx Shearwater was picked up in a corn-field near Tichmarsh, and sent to me alive. I find in my note-book for the previous day, "Fine, but with raging westerly gale."

SEPTEMBER.

2nd. First Grey Wagtail of season in the flower-garden at Lilford.

3rd. I received from an obliging stranger at Higham Ferrers a young Shag, perfectly uninjured and apparently healthy and vigorous, with the information that it had been picked up near that town. I may add that the weather since August 30th was very stormy—westerly gales and driving showers.

19th. A flock of Wild Geese passed southwards—the first report for this season that reached me. I am convinced that the majority of the Geese that pass over our district in August and September are Greylags, but as they hardly ever settle on the ground at these seasons, I have, of course, no proof to adduce, with the exception of having occasionally heard their cry.

23rd. I received a letter from the Rev. E. Sylvester, in reply to my enquiries, in which he assured me that there was no mistake in a story conveyed to me from him by Lady Lilford in July last, to the effect that two pairs of Crossbills had nested and reared their broods in his garden at Deene Rectory this last

spring. When I first heard of this occurrence I was inclined to think that the supposed Crossbills might in fact have been Hawfinches, but Mr. Sylvester's letter of yesterday leaves no shadow of a doubt as to the correct identification of the birds in question. The Crossbill is, in my experience, exceedingly scarce in this county at any season of the year, and up to this date no suspicion even of its breeding in Northamptonshire has ever come to my knowledge.

24th. Our Swallows and House-Martins suddenly, and almost entirely, disappeared from Lilford.

25th. Three "Sea-Gulls" and one "Sea-Swallow" reported by the decoy-man.

26th. A very considerable passage of Meadow-Pipits up our valley, and some twenty Herring-Gulls passed over Lilford to the south-west. Four Buzzards reported near Irchester by the Rev. Henry H. Slater.

30th. A solitary Golden Plover reported by the decoy-man.

OCTOBER.

1st. I noticed a continuous passage of small parties of Sky-Larks over our meadows near Lilford to the south, and heard the first Brambling of the season.

3rd. First Pochard of season on the decoy-pool.

6th. I saw a Merlin near Achurch.

8th. In 'The Field' of this date Mr. W. Tomalin records the finding of seven, and shooting of five, Quails near Great Addington; this species has of late years become exceedingly scarce in this part of Northamptonshire. First record of Grey Crows for the season.

9th. Seventeen Wild Geese passed over Thorpe in a north-easterly direction.

11th. We saw the first Redwings of the season — very unusually late.

12th. Considerable arrival of Fieldfares, and large travelling flocks of Wood-Pigeons.

14th. First report of Woodcock for the season on Clapton manor.

NOVEMBER.

1st. My nephew reports an extraordinary assemblage of Peewits on the meadows near Tichmarsh.

8th. I heard, on good authority, of the very recent occurrence of Snow Buntings near Kettering.

17th. A Puffin recently obtained near Cottingham was sent to me as a specimen of Little Auk. I heard, to my infinite disgust, of the destruction of a pair of Hobbies with one of their brood, in Salcey Forest, in August last.

21st. The decoy-man tells of two Shovellers on the pool. Many Curlews heard passing over Lilford in the fog this morning.

22nd. Two Goldeneyes reported in our park-pond.

25th. My friend Mr. G. M. Edmonds, of Oundle, in a letter received to-day, informs me of a bird seen several times by him, his son, and others, in and near Oundle, during the past summer, that could have been nothing more or less than a male Golden Oriole.

DECEMBER.

6th. A small trip of Golden Plovers seen by my son near Thorpe.

7th. An immature Common Gull shot at Lilford.

8th. A very fine adult male Pochard shot on the river below the house at Lilford. Seven Golden-Plovers passing southwards.

10th. About 100 "fowl"—Mallard, Wigeon, Shovellers, and Pochards—seen on the flooded meadows below Lilford; this is the first noteworthy congregation of wildfowl of which I have heard this season.

12th. My son reports vast numbers of Wood-Pigeons in our oak-woods. We have a very plentiful crop of acorns, and from the above, and many other reports recently received, I believe that there are more Wood-Pigeons in this neighbourhood than at any time since the winter of 1870-71.

16th. A male Shoveller, about half-moulted, brought in from the river below Lilford.

16th. A Curlew was seen near Thorpe and Tichmarsh by several separate persons. This is an unusual occurrence hereabouts at this season.

19th. The decoy-man brought in nine Teal from the decoy, and left about as many more on the pool: this is the first "lot" of this species that has visited the pool this season. The decoy-

man reports having seen, some days ago, a trip of about forty Golden Plovers, and a Peregrine driving a Mallard to covert.

26th. My son shot, close to Lilford, a male Goldeneye, just beginning to show the white feathers of cheek-patches. This autumn has been remarkable for the scarcity of Snipes in our neighbourhood, for the abundance of Partridges and wild-bred Pheasants; also of travelling Wood-Pigeons, as above recorded. Our summer migrants were, with very few exceptions, perhaps, rather in excess of their average numbers, and more Hawfinches nested in our district than on any previous occasion within "the memory of the oldest inhabitant."

I append my accustomed list of earliest records of arrival of summer migrants, as reported to or observed by me; where no locality is specified, understand Lilford:—March 15th, Wheatear; 21st, Whimbrel, Willow Wren (Northampton); 24th, Chiffchaff; 31st, Swallow (Cotterstock). April 1st, Nightingale (Northampton); 6th, Wryneck; 8th, Blackcap; 10th, Ray's Wagtail, Cuckoo, Tree Pipit; 14th, Redstart; 17th, Bank-Martin, Sedge Warbler; 19th, Whitethroat; 20th, Lesser Whitethroat; 22nd, Common Sandpiper; 24th, Grey-backed Wagtail (Kingsthorpe); 25th, Garden-Warbler, Corn-Crake (Cotterstock); 29th, Reed-Warbler. May 1st, Red-backed Shrike; 5th, Swift (Northampton); 7th, Spotted Flycatcher; 8th, Turtle Dove; 21st, Nightjar. June 2nd, Hobby.

THE PTARMIGAN IN LAKELAND.

BY REV. H. A. MACPHERSON, M.A.

As the question of the former existence of the Ptarmigan, *Lagopus mutus*, in Lakeland has on more than one occasion been discussed in 'The Zoologist,' I venture to ask for space to explain the present position of the case. When last referred to (Zool. 1887, p. 153), I pronounced against the supposed existence of this bird on our Lake hills, and with good reason, since no one could produce a local specimen. But a communication of the Rev. H. T. Frere crossed my last note, in which he stated that a local example of the Ptarmigan did exist in a museum at

Keswick in 1841. Subsequently I discovered that this bird had existed in the local collection of John Hutton, a guide and native of Keswick. Hutton formed his collection in the year 1785. Budworth, who wrote in 1795, was apparently the first to refer to the birds preserved in Hutton's museum, but this only in reference to the Dotterel.

The author of the 'Observations, chiefly Lithological,' visited the Lake district in 1803, and he describes the contents of the local museums pretty minutely. Hutton's museum delighted him for two reasons. Though small, it was well arranged, and Hutton himself was able to give him much local information. He names five and twenty of the more interesting species of birds contained in Hutton's museum, the Ptarmigan being included between the Red and Black Grouse. He does not tell us whether the specimens of birds were labelled or not, but his reason for mentioning them was that they were local; otherwise no special interest attaches to them. They are mentioned only by their scientific names. It appears to me, as I have stated in the 'Fauna of Lakeland,' that the fact that the Ptarmigan is thus *recorded* to have been represented in Hutton's local museum as early as 1803 goes far to support Dr. Heysham's statement as to its existing locally. The bird may have been obtained as early as 1785, or may have existed in Hutton's possession before ever he thought of forming his museum.

But we must not lose sight of the fact that the Rev. H. T. Frere saw this bird as late as 1841; and that he learnt orally, or from a label attached, that the bird had been killed on Skiddaw. What became of this historical link with the past, finally, is more than I can say; for the museum itself was broken up before I was born. Hutton died on the 19th of March, 1831. His daughter, in whose charge Mr. Frere found the museum in 1841, died on the 14th of December, 1855. For some few years before her death, Miss Hutton had been selling off articles as purchasers wanted. She finally sold the remains of the collection, formed in 1785, some six or twelve months before her death. I may add that the catalogue of Crosthwaite's museum is in my possession, and shows that there was no Ptarmigan in the hands of Peter Crosthwaite.

A writer, who has prudently veiled his identity, states in the 'Annals of Scottish Natural History' (No. 5, p. 62), that I base

my belief in the *quondam* existence of the Ptarmigan in Lakeland, "on the former existence of a single example in a local museum, but without any label or document to state the locality it was obtained from." This statement travesties my position. We have absolutely *no* grounds for saying that any bird in Hutton's museum was or was not labelled. We know that some of them were local, independently; but I believe that as the localities for the minerals in the collection were, we know, forthcoming, so would be the localities for the local birds. All memory of the former existence of the Ptarmigan has long since died out among our dalesmen; but it must be borne in mind that during the ten years during which I ransacked Lakeland for information, constantly seeking out the oldest inhabitants, I found it very difficult to procure even traditional accounts of the Red-deer of Ennerdale or the Sea Eagles which had their eyries in Borrowdale. Nay, the Kite nested near Keswick until fifty years ago; yet I have only seen two veterans, both since deceased, who could recall the "silver'd Kite" as breeding in their native region.

Did time and circumstances permit, I think it probable that proof of the former existence of the Ptarmigan in Lakeland could be obtained from the limestone caves of Westmorland.

THE LATE PROF. J. O. WESTWOOD, M.A., F.L.S.

FOLLOWING closely upon the death of the late Mr. Stainton, whose loss we have had so lately to deplore, has come the demise of another well-known entomologist, Professor John Obadiah Westwood, of Oxford. On the 2nd January last, at the advanced age of eighty-seven, he passed peacefully away, endeared to those who knew him by his affability of manner, kindness of heart, and constant readiness to help all who applied to him for information. For thirty years he occupied the position of Hope Professor of Invertebrate Zoology at Oxford, but for twice thirty years his name has been known as that of a leader amongst entomologists. For he commenced his studies of insects so long ago as 1827, in which year he first began to publish the results of his observations. At this time he had embraced the law as a

profession, and practised for a few years in London as a solicitor; but finding this distasteful he gave it up, and devoted himself to more congenial though less profitable pursuits, namely, entomology and archæology. In both these subjects, apparently so dissimilar and yet both perhaps traceable to his talent for drawing, he acquired a high reputation; and though his name is probably most widely known through his 'Introduction to the Modern Classification of Insects,' his 'British Butterflies' and 'British Moths,' written in conjunction with Humphreys, his share with Spence Bate in the volume on 'British Sessile-eyed Crustacea,' his 'Arcana Entomologica,' and his 'Genera of Diurnal Lepidoptera,' in which he co-operated with Hewitson and Doubleday, yet for archæologists his name will always live in connection with the 'Palæographia Sacra Pictoria,' the 'Facsimiles of the Miniatures and Ornaments of Anglo-Saxon and Irish MSS.,' and his 'Lapidarium Walliæ.'

His connection with Oxford was due to his friendship with the Rev. F. W. Hope, who in 1858 presented to that University a valuable collection of insects, and formed the Hope Museum, of which Westwood became curator. At that date there was no Professorship of Zoology at Oxford, and Hope endowed a chair of Invertebrate Zoology, to which he was to make the first nomination, and he accordingly, in 1861, appointed Westwood, who thereupon left London to live at Oxford, where he continued to reside until his death. Having had no University career, he received an honorary degree of M.A., and in 1880 became an Honorary Fellow of Magdalen College. He was an original Fellow of the Entomological Society, which was founded in 1833, and was elected Secretary thereof the following year. On three occasions he was elected President for periods of two years, and on the occasion of the Jubilee of the Society in 1883, he was appointed Honorary President for life. He had long previously been elected a Fellow of the Linnean Society, namely, in 1827, and was either an ordinary or an honorary member of all the leading entomological societies abroad. In 1855 he was awarded the Royal Medal of the Royal Society, and, if he had been so minded, might have been elected a Fellow of that august body; but he would never consent to be nominated, though, in the opinion of his friends, success would have been certain.

He was strongly opposed to the views of Darwin and his immediate followers, and in the controversy which followed the publication of the 'Origin of Species' he appeared in print amongst the oppositionists. He was content, however, with this protest, for controversy was distasteful to him, and he preferred the quiet of his study to the excitement of debate.

He devoted himself to the arrangement of the fine collection of insects under his charge at Oxford, and in due course described and figured the new and rare species in the Hope Museum in his splendid 'Thesaurus Entomologicus Oxoniensis.'

In the same year (1874) he produced a second edition of his 'Butterflies of Great Britain,' for which he prepared the plates as well as the text; and in 1880 appeared his final great work, the 'Revisio Insectorum Familiæ Mantidarum.'

The volumes named may be regarded as his chief contributions to science, in addition to which he published innumerable memoirs in the 'Proceedings' and 'Transactions' of various learned societies, and to the scientific journals of the day, which for sixty years he continued to enrich with his communications. A recognised authority on Economic Entomology, he was for many years on the staff of the 'Gardeners' Chronicle,' acting as editor of that particular department, and in the opinion of those best qualified to judge, no writer of the present age has done more to advance our knowledge of the structure and life-history of insects than he has.

Taking up small groups in all Orders and working them out thoroughly, he contrived by his clear descriptions and excellent illustrations to remove a great deal of old-world misconception, and in these monographs, by laying new and solid foundations of fact, he has admirably paved the way for further research by those of a younger generation who may have the energy and the ability to follow in his footsteps.

NOTES AND QUERIES.

MAMMALIA.

Polecat near Aberystwith.—On the 4th January last I obtained a Polecat, about six miles south of Aberystwith, and there is reason to believe that this species is by no means extinct in this county.—J. W. SALTER (University College, Aberystwith).

Polecat in Cheshire.—As the Polecat must be rare in these parts, you may care to place on record the fact that a specimen was killed, fifteen years ago, in Burley Hurst Wood, near Mobberley, in Cheshire. My informant is Mr. Joshua Pearson, gamekeeper to Mr. Henry R. Greg, of Lode Hill, near Handforth.—J. E. KELSALL (Wavertree, Liverpool).

Otter in Sussex.—A male Otter was killed at Great Knolle, Beckley, near Rye, Sussex, on the 12th of November last.—G. W. BRADSHAW (Hastings).

Mortality amongst Rabbits in Tasmania.—Apropos of Mr. Miller Christy's remarks (Zool. 1892, p. 378) on the mortality which occurs periodically amongst the Rabbits in the Canadian North-West (*Lepus americanus*), it may be observed that Tasmanian papers are just now rejoicing over the appearance of a fatal disease which has attacked the Rabbits in some parts of that colony, and which they hope will result in a natural remedy against the ravages of the rabbit-pest. The Rabbits affected die when about half-grown, and their dead bodies are to be found in large numbers. The carcasses have been examined by the Government veterinary surgeons, whose opinion is that it is totally distinct from the ordinary tuberculosis, although in some respects the symptoms are closely allied or identical, there being the greatly enlarged abdomen and tuberculous liver. In many localities it is said that the disease is so severe that not a single healthy Rabbit can be found within them. The veterinary surgeon identifies the symptoms as those caused by the *Coccidium oviforme*, and he thinks it desirable that experiments should be tried in order to ascertain whether the disease cannot be artificially spread amongst the Rabbits in other localities. In this country we have no means of judging whether the disease which has been discovered is merely an aggravated form of the ordinary tuberculosis, which is so fatal in some of our own overcrowded warrens, in which the Rabbits are closely interbred. Should this be the case, beneficial results from it can hardly be expected, as the disease, so to speak, cures itself by the destruction of the animals affected, and by the lessening of their numbers to a healthy standard. See the statistics given by Mr. Christy, *l. c.*

Daubenton's Bat in Cheshire.—On the 26th December last I paid a visit to the disused copper mines on Alderley Edge, and secured several Whiskered and Long-eared Bats. I had taken both species at Alderley several times before, and on this occasion I carelessly neglected to examine my captures, some of which I sent to my friend Mr. L. E. Adams. A day or two later he wrote me that one of the supposed *mystacinus* appeared to be a different species. The skin and skull were subsequently submitted to Mr. Oldfield Thomas, of the British Museum, who identified the bat as *V. daubentonii*.—CHAS. OLDHAM (Ashton-on-Mersey).

Black Variety of the Brown Rat.—A few weeks ago there were indications that a rat had been endeavouring to scratch a hole into my poultry-house; so I set a trap in the run, and found the animal safely captured the next morning. But, to my surprise, instead of an ordinary brown rat, it was perfectly black, and I at once flattered myself that I had a specimen of the now rare *Mus rattus*. On closer examination, however, it appeared to be larger, the ears smaller, and the tail shorter than any specimen I had seen of *M. rattus*, and I came to the conclusion that it must be either a hybrid or a case of melanism of *M. decumanus*, and I inclined to the latter view. I at once posted it to my friend Mr. William Evans (author of 'The Mammalia of the Edinburgh District'), for the opinion of himself and Mr. Eagle Clarke, of the Edinburgh Museum, both of whom concur in my idea that it is a melanism of *M. decumanus*, and worthy of preservation; so it was placed in the hands of a taxidermist, and is now here well mounted. Mr. Clarke states that several similar instances have occurred in the Hebrides, and that this form was described by Thompson as *M. decumanus* var. *hibernicus*, but I do not know whether there have been many similar occurrences in Ireland.—A. B. HUBERT (Mitcham Grove, Surrey). [A figure of *Mus hibernicus*, Thompson, will be found in 'The Zoologist,' 1889, pl. iv.—ED.]

BIRDS.

Hybrid Finches at the Crystal Palace.—On the opening day of the recent Birds' Show I paid a hurried visit to the Crystal Palace, and was well repaid. The afternoon was, however, very dark, and it was impossible to see many of the specimens properly. Nine cases of hybrid British Finches were exhibited, *viz.*, Bullfinch and Goldfinch, Bullfinch and Linnet, Goldfinch and Greenfinch, Goldfinch and Linnet, Linnet and Greenfinch, Linnet and Bullfinch, Redpoll and Goldfinch, Siskin and Redpoll, and Brambling and Chaffinch. There was also on view a bird described as a cross between the Blackbird and Thrush, about which I hope to get further particulars. The bird in question certainly showed marked characteristics of both species. In general shape and attitude it resembled a Thrush, and I made the following rough note as to its

plumage :—“ Upper parts and tail darker than the Thrush ; no light edges to wing-coverts ; breast and belly covered with dark blotches, giving the bird, at a little distance, quite a black appearance ; bill seems to be longer and thicker than in the Thrush ; upper mandible brown ; lower mandible yellow, except just the tip ; eyelids yellow, as in Blackbird ; legs and feet pale brown ; claws, some dark and some colourless.” In the variety class there was an extraordinary Bullfinch, showing a combination of albinism and melanism, the upper parts being chiefly black and white, and the lower parts black and dull red. As usual, some of the birds were curiously misnamed. One class for “ British Birds larger than Woodlark ” contained an Alpine Chough, described on the Catalogue as a Cornish Chough ; while in the class for “ British Birds not larger than Woodlark (Woodlark included),” there was a crested green Canary with a yellow tail ! The various Canary mules occupied over 150 cages, and included crosses with the Goldfinch, Linnet, Siskin, Greenfinch, Redpoll, and also with the Mealy Redpoll and Chaffinch ; this last hybrid is said to have been bred in a garden aviary.—A. HOLTE MACPHERSON (51, Gloucester Place, Hyde Park, W.).

Notes from Aberystwith.—The immigration of Grey Phalaropes which followed the gales of mid-October was well marked upon this part of the coast. Between the 17th and 24th of that month eighteen specimens were received by our local birdstuffer. On the 19th I watched four of these birds swimming under the lee of some rocks in front of the Terrace. On March 27th, last year, two Ravens’ nests, in an inland locality some thirty miles distant, proved to contain, the one young just hatching, the other three fresh eggs. A third nest, the following day, also contained three fresh eggs. On April 21st, in spite of snow on several preceding days, young Stonechats were hatched, and showed their first feathers. On the 30th, the mud-flats of the Dovey estuary were alive with Ring Plovers and Dunlins, and I made out a single pair of Sanderlings. On May 8th, a Buzzard’s nest, in the same neighbourhood as the Ravens’ before mentioned, contained two eggs, incubated about a fortnight. I have visited several of the wildest districts of Central Wales, and have nowhere found the Buzzard at all plentiful ; keepers and shepherds everywhere know that it is a bird which will fetch a fair price. A Kestrel’s nest contained eggs of precisely the same type as some taken from the same hole ten years previously. Almost all the Warblers, with the exception of the Nightingale, visited this western locality. The Blackcap I met with in fair numbers ; the Garden Warbler was decidedly less plentiful. I listened, however, in vain for the Lesser Whitethroat. The Redstart and Wood Warbler were abundant in all suitable localities. On June 1st, when visiting a part of our cliffs which is little explored, a Peregrine Falcon flew round overhead with much outcry ; she doubtless had young ones. The Choughs are all but gone ; I doubt if we have more than a single pair

upon the coast for ten miles in either direction. On June 6th, the Cormorants' nests on the Bird Rock, near Towyn, contained well-fledged young ones. On the 8th I visited an inland nesting-place of the Lesser Black-backed Gull, upon a bog some twenty miles from the sea. The bog being preserved for game, this colony has been much persecuted, and hence—as well as newly-hatched young—we found plenty of fresh eggs. One nest contained four, an exceptional number. I noticed a Ring-tail (female Hen Harrier) beating over the marsh in search of a brood of Teal; she was doubtless foraging for her young ones. On June 27th, skirting the Dovey estuary, I saw, from the train, two broods of young Sheldrakes within a few yards of the line. On the 9th I found a small colony of Lesser Terns, about seven pairs, breeding within a few miles of Barmouth. On Jan. 6th, 1893, there was a great rush of birds southwards along the coast, as always after the first decided snowfall of the winter. I found by experience that, for some hours, a minute never elapsed without a flock passing. Nine-tenths of the migrants were Sky Larks and Starlings; but Redwings, Chaffinches, Yellowhammers, and Linnets all contributed their quota, while several times I recognized the Snow Bunting by its note. A Peregrine was seemingly on the look-out for passing Curlew. There were Bramblings in every stack-yard, and I made out a single Wood Lark, as I also did, under precisely similar conditions, on Jan. 10th last year. On the 9th there were scores of Sheldrakes and two parties of Brent Geese in the Dovey estuary.—J. H. SALTER (University College, Aberystwith).

Purple Gallinule in Norfolk.—Mr. Everard's keeper shot one of these birds at Stone Ferry, near Market Downham, in November last. The plumage was in a perfect state, and the bird was to all appearances a genuine wild one. I know many will say that such birds are kept for ornament, and are escaped specimens; but birds of this kind, being expensive, are usually pinioned, and as I fancy they have not bred in confinement (at least I have never heard of their doing so), this to me is a great deal in favour of their being genuine wild birds. The place where the one referred to was shot is just the one a strange bird would choose to pitch into, there being over a thousand acres of swamp, and the covert is thick and high.—J. WHITAKER (Rainworth, Notts). [Query, species.—ED.]

Purple Gallinule in Sussex.—On the 5th August last Mr. Sandeman's coachman brought a specimen of this Waterhen to Richardson, the bird-stuffer at Horsham, to be preserved. He had shot it at Westbrooke, near Warnham (which is only a short distance from Horsham), the previous day. The plumage was in perfect order, and the bird, to all appearance, a purely wild one.—J. WHITAKER (Rainworth, Notts). [Query, species.—ED.]

Garganey in Holderness.—Mr. Slater is probably correct as to the date of the Garganey being Sept. 2nd, and not the 19th (p. 73). The two dates have undoubted reference to one and the same bird, one only I find

having been shot by Dr. Hewetson and party. This I examined as a skin in October, and entered from oral evidence in my note-book as obtained on Sept. 19th, which is doubtless an error.—JOHN CORDEAUX (Eaton Hall, Retford).

Former abundance of the Kite in London.—In 'A Relation of the Island of England,' written about 1500 by an Italian, name unknown, but possibly the Secretary of Francesco Capello, and printed in this country by the Camden Society, mention is made of "Kites which are so tame that they often take out of the hands of little children the bread smeared with butter." This no doubt refers to London, for in a previous paragraph the writer observes, "It is truly a beautiful thing to behold one or two thousand tame Swans (*cigni mansueti e domestici*) upon the River Thames." This testimony to the former abundance of the Kite, which acted as a scavenger in our great cities, is interesting. The writer also mentions Pea-fowl, Partridges, and Pheasants, and states there was a penalty for destroying Ravens, which also helped to keep the streets of the towns free from filth. Prof. Newton states (Encycl. Brit.—*Birds*) that in 1555 there was a penalty for destroying Kites. In 1562 laws were made for keeping the streets clean, and the throwing out of offal from butchers' shops was forbidden. After that there was probably less need of Kites and Ravens, and doubtless not so many of them in consequence.—J. H. GURNEY (Keswick, Norwich).

[The protection formerly afforded to Kites in London is mentioned by the old naturalist, Charles Clusius, in a note to the observations on this bird by the French ornithologist, Pierre Belon. He expressly says, "*Cum eos enim interficere vetitum sit.*" The whole passage is cited in the 'Birds of Middlesex,' 1866, p. 10.—ED.]

Ferruginous Duck in Ireland.—A specimen of this duck was shot on the Shannon, near Athlone, on 21st January last, by Mr. R. Surtington, of Athlone. In the description of the adult male in Yarrell's 'Birds,' I do not see any mention of the white margin round the fore part of the wing, or the minute dappling all over the back, similar to those on the back of the adult Tufted Duck, the female of which it resembles very much in shape and distribution of colour.—E. WILLIAMS (2, Dame Street, Dublin).

Lesser Whitethroat in the North of England.—It was with interest that I read, in 'The Zoologist' for February (p. 74), Mr. Alfred C. Chapman's account of the occurrence of the Lesser Whitethroat at Moss House, Co. Durham, and the *résumé* by Mr. Saunders on the distribution of the species which follows; but as the statement that it "is not authenticated in Northumberland" is rather misleading, perhaps you may consider the following worth insertion. So long ago as 1831 Selby wrote of this bird, "it is rare in the north of England," but added, "specimens have been killed in the neighbourhood of Newcastle, and Mr. Wm. Procter, of Durham, has also found it in the vicinity of that city"; while Hancock ('Birds of

Northumberland and Durham') says, "this spring and autumn migrant is not by any means so abundant as the two previous species" (the Blackcap and Garden Warblers), but goes on to say that he had himself taken two or three of its nests near Newcastle, the only one particularised being at Scotswood Dene in 1832. I have personally noticed the Lesser Whitethroat, about the end of May, in the valley of the Darwent near Burnopfield, Co. Durham; but the only instance in which I have met with it in Northumberland was in 1881, when, as recorded in the 'History of the Berwickshire Naturalists' Club' (vol. x. p. 389), I shot two young birds, on the autumn migration, in our garden here, about the middle of September. One of these, I am pleased to say, is still preserved in my collection, but the other having fallen, when shot, into the way of a tame fox, which we then had in the garden, was devoured by him, only sufficient being saved to enable me to identify the bird. Berwick, though on the other side of the Tweed, is yet in England, and for parliamentary and other purposes forms part of Northumberland, so that we may therefore claim the record. Although Mr. Muirhead is probably right in discarding the Lesser Whitethroat from the 'Birds of Berwickshire,' with the remark that "no specimen has yet (March, 1888) been obtained" in that county, my friend Dr. Charles Stuart is persistent in declaring that he has, on at least one occasion, thoroughly identified it near Chirnside, during the breeding season, and I know lives in the hope of being able some day to satisfy sceptics by indisputable evidence of its occurrence there.—GEORGE BOLAM (Berwick-on-Tweed).

Lesser Whitethroat in Co. Durham.—Mr. Chapman is perfectly right—this bird is extremely scarce in the county, and I have often wondered why. I was as keen a birdsnester when a boy as anybody, and knew the neighbourhood of the city of Durham, where I was at school for eight years and a half, as well as most people. During the above time I only saw two nests of the Lesser Whitethroat, both, curiously enough, in the same plantation near Bear Park, the only locality where we ever heard or saw the bird near Durham. The place is now a congeries of pits, pit-heaps, and cottages, and one might now look with as great probability of success for a Great Auk. I have only thrice seen the nest in Northumberland. This bird is so plentiful in the Midlands—here in Northamptonshire, for instance—and also extends its range so much further north—it is not uncommon in Norway, and I found it on the Dovre fjeld almost up to 4000 feet—that its curious scarcity in N.E. England must be due, one would think, to some minute economical reasons which do not come within our ken. As to the Lesser Whitethroat's being "not authenticated in Northumberland," that assertion is a little too sweeping. See Hancock's 'Catalogue,' pp. 71, 72, and my own recorded experiences in 'The Zoologist,' 1884, p. 93. If further proof be needed, I can show some eggs from the Tyne Valley.—H. H. SLATER (Irchester Vicarage).

Bittern in Sussex.—On January 9th a large male Bittern was shot at Sompting, near Worthing, and was brought to us for preservation. Its stomach contained a Thrush, which had been swallowed entire. A short time previously we had an immature Heron, which had in its stomach a full-grown common rat.—J. PRATT (Brighton).

Little Gull in Kent.—On January 19th I received a Little Gull, *Larus minutus*, from a fisherman who sends me anything he gets that he thinks worth having. This species has occurred not unfrequently on this coast; I have had four specimens within the last twenty years, and it is probably hardly worth recording, unless it may be from the circumstance of its having the beautiful roseate colour on the under parts, which I should hardly have expected in mid-winter. The bird is, of course, an adult; it looks like a bird in the summer dress, were it not for the head. This, of course, has lost the black, and has only a dark grey patch on the occiput.—W. OXENDEN HAMMOND (St. Alban's Court, Wingham).

Little Gull in Notts.—I saw a very pretty specimen of this gull at Rose's, the birdstuffer in Nottingham. It was shot by a man on the Trent, near the town of Nottingham, on the 29th of December last. It was a bird of the year.—J. WHITAKER (Rainworth, Notts).

Iceland Gull at Harwich.—On Dec. 3rd I was fortunate enough to secure, in the harbour here, a specimen of this rare Gull, in immature plumage. The previous record of this bird having visited the Essex shores is that in 'The Zoologist' for 1887 (p. 466), which Mr. Miller Christy says, in his 'Birds of Essex' (p. 262), is the only record for that county.—F. KERRY (Harwich).

Bewick's Swan at Annesley.—On Dec. 9th, during the sharp spell of frost we had, sixty wild Swans flew over the head of Mr. Musters, in Annesley deer-park. They were so small that he had no doubt they were of this species. This is the largest lot of wild Swans I have ever heard of being seen in one flock in this county.—J. WHITAKER (Rainworth, Notts).

Serin in Ireland.—On the 2nd of January one of our local bird-catchers brought me a bird which he described as a "mule Siskin." I was much pleased to identify it as a Serin, *Serinus hortulanus*, in adult winter plumage, the first occurrence in Ireland. From the fact of never seeing a caged bird of this species here, and the capture of upwards of a dozen in England, I think there can be little doubt that this was a genuine wild bird, and as such entitled to be added to our Irish list.—E. WILLIAMS (2, Dame Street, Dublin).

Lapland Buntings, Bernicle, and Spoonbill.—A good many Lapland Buntings and large numbers of Snow Buntings have passed along the downs during the last few weeks. We have also received a fine Bernicle Goose from Cumberland, and another on Jan. 19th, shot in Lincolnshire.

An immature Spoonbill was brought to us on October 6th last, shot on the banks of the Adur, near Shoreham.—PRATT & SONS (Brighton).

Black-tailed Godwit in Nottinghamshire.—One of these birds was shot by a farmer near Newark-on-Trent during September last. It was amongst his fowls and pigeons which were feeding in a grass-field close to his house. His attention was first drawn to it by the pugnacious way it was behaving to his birds, dashing at them and driving them about, and it permitted him to walk up and shoot it.—J. WHITAKER (Rainworth).

Waxwing in Staffordshire.—A specimen of this bird was shot at Oulton, near Stone, in this county, on the 14th of January, by a boy with a catapult. The bird was very tame, and appeared to be feeding on the berries of the wild-rose.—E. W. H. BLAGG (Cheadle, Staffordshire).

Waxwing in Cambridgeshire.—As there has been a migration of Waxwings into England this winter, it may be interesting to note that I have examined a female example of this bird in the shop of Mr. Baker, taxidermist, Cambridge, which he informed me was shot in January near that town.—G. E. H. BARRETT-HAMILTON (Trinity College, Cambridge).

Waxwings near Harwich.—On Jan. 30th a pair of Waxwings, *Ampelis garrulus*, were shot in a garden at Great Oakley, near Harwich, by a man named Keeble, of whom I purchased them for my collection.—F. KERRY (Harwich).

Waxwing in Co. Wicklow.—A specimen of the Waxwing, *Ampelis garrulus*, was shot in the village of Delgany, Co. Wicklow, in the early part of January last. It was exceedingly fat, and had been feeding on holly-berries.—EDWARD WILLIAMS (2, Dame Street, Dublin).

Willow Wren in Winter—Ruff in Sussex.—On calling on Mr. Bristow, taxidermist, St. Leonards, he informed me he shot a Willow Wren in a brickfield near here on Dec. 26th, on which day people were skating all about here. He also had a Ruff, *Machetes pugnax*, brought to him to be set up, shot on the same day at Bexhill.—G. W. BRADSHAW (Hastings).

Hen Harrier at Rainworth.—During the last month one of these hawks has been repeatedly seen flying in these parts. It is a male, in the pale violet-grey coloured plumage, and has so far escaped the snare of the fowler.—J. WHITAKER (Rainworth, Notts).

Variety of Woodcock.—A beautiful variety of this bird was shot at Invar, in Scotland, in November last. The back is of a rich light brown, marked here and there with black; the wings pale violet-grey with chestnut markings, the two outer feathers being marked with bronzy gold, which when caught in certain lights have a sheen like the golden feathers on the breast of a pheasant; the tail is dark slate with chestnut bars. It is a

most peculiar bird, and its beauty must be seen to be realised. It is one of the most extraordinary varieties of this bird I have ever seen.—
J. WHITAKER (Rainworth, Notts).

SCIENTIFIC SOCIETIES.

LINNEAN SOCIETY OF LONDON.

February 2, 1893.—Prof. STEWART, President, in the chair.

Mr. John Percival was elected, and Mr. William Whitwell was admitted a Fellow of the Society.

On behalf of Mr. Thomas Scott, the Secretary read a report on the Entomostraca from the Gulf of Guinea, collected by Mr. John Rattray.

Mr. H. Bernard gave an account of two new species of *Rhaz*.

An important paper, by Mr. Arthur Lister, "On the division of nuclei in the Mycetozoa," gave rise to an interesting discussion, in which Dr. D. H. Scott, Prof. Howes, and others took part.

This was followed by a paper "On the structural differentiation of the Protozoan body as studied in microscopic sections," by Mr. J. E. Moore.

February 16.—Prof. STEWART, President, in the chair.

Mr. R. Spruce was elected an Associate of the Society.

Mr. Clement Reid exhibited and gave an account of some seeds of *Paradoxocarpus carinatus*, an extinct Pliocene and Pleistocene plant from the Cromer fossil-bed. Mr. Reid also exhibited and described some examples of *Potamogeton headonensis*, a new type of pond-weed from the Oligocene strata of Hordle Cliff, in Hampshire. His remarks, which were listened to with great interest, were elucidated with the aid of diagrams, and were criticised by Mr. W. Carruthers and others.

Mr. J. E. Harting exhibited some dried plants of the so-called Greek Tea (*Sideritis theezans*, Boissier), which during a recent visit to Thessaly he had found to be extensively used there, as an infusion, in lieu of tea. He also exhibited some photographs of Thessalian scenery, showing the geological and botanical character of the country bordering the great plain of Larissa.

Dr. Otto Stapf pointed out on the map the scene of his botanical explorations in Persia, and gave some account of the flora of that region, as far as has been at present ascertained.

On behalf of Mr. C. B. Plowright, a paper, communicated by the President, was read on the life-history of the *Æcidium* on *Paris quadrifolia*.

On behalf of Mr. J. C. Willis, M.A., who was unfortunately prevented by illness from attending, a paper was read entitled "Contributions to the Natural History of the Flower." This paper, the first of a series, dealt with the fertilization by insects of plants belonging to the genera *Claytonia*, *Phacelia*, and *Monarda*.

Some observations on British Worms, by the Rev. H. Friend, were read on his behalf by the Secretary.

ZOOLOGICAL SOCIETY OF LONDON.

February 14, 1893.—OSBERT SALVIN, Esq., F.R.S., Vice-President, in the chair.

The Secretary read a report on the additions that had been made to the Society's Menagerie during the month of January, 1893.

Prof. G. B. Howes exhibited and made remarks on an abnormal sternum of a Marmoset, *Hapale iacchus*, in which the mesosternal elements of the opposite sides were distinct, and alternately disposed, and discussed its probable bearings upon the sternum of the Anthropomorpha, particularly as represented by the Orang.

Prof. T. Jeffrey Parker read a paper on the cranial osteology, classification, and phylogeny of the *Dinornithidæ*. The author gave a detailed description of the skull in various genera and species of Moa, founded upon the examination of more than 120 specimens. A detailed comparison with the skulls of the other *Ratitæ* followed, as well as an extensive series of measurements. The bearing of the facts ascertained upon the classification of the family was discussed. The author recognised five genera of *Dinornithidæ*, arranged in three subfamilies as follows:—Subfamily *Dinornithinæ*; genus *Dinornis*. Subfamily *Anomalopteryginæ*; genera *Pachyornis*, *Mesopteryx*, and *Anomalopteryx*. Subfamily *Emeinæ*; genus *Emeus*. The phylogeny of the group was then discussed. *Mesopteryx* was considered to be the most generalised form, while *Dinornis* and *Emeus* were both highly specialised, but in different directions. Of the other *Ratitæ*, *Apteryx* came nearest to the Moas in the structure of its skull, and strong affinities were shown to the New Zealand genera by *Dromæus* and *Casuarinus*. *Struthio* and *Rhea*, on the other hand, showed no special affinities, so far as the skull is concerned, either to the Australasian forms or to one another.

Mr. R. Lydekker read a paper on the presence of a distinct coracoidal element in adult Sloths, and made remarks on its homology. It was shown that in two skeletons of Sloths in the British Museum the shoulder-girdle exhibited a distinct coracoidal element. This element, like the coracoid process of the human scapula, was correlated with the precoracoid of the lower vertebrates; and the question was then discussed as to the name by which it should properly be called.

A communication was read from Dr. G. Radde, containing an account of the present range of the European Bison in the Caucasus.—P. L. SCLATER, *Secretary*.

ENTOMOLOGICAL SOCIETY OF LONDON.

February 8, 1893. — HENRY JOHN ELWES, Esq., F.L.S., F.Z.S., President, in the chair.

The President announced that he had nominated Mr. F. DuCane Godman, F.R.S., Mr. Frederic Merrifield, and Mr. George H. Verrall, as Vice-Presidents during the Session 1893–1894.

Mr. Charles R. C. Hibbert, of Holfield Grange, Coggeshall, Essex; Mr. Oswald B. Lower, of Bleak House, Parkside, Adelaide, South Australia; and Mr. John Baxter Oliver, of 12, Avenue Road, St. John's Wood, N.W., were elected Fellows of the Society.

Mr. S. Stevens exhibited a specimen of *Chærocampa celerio*, in very fine condition, captured at light, in Hastings, on the 26th September last, by Mr. Johnson.

Mr. A. J. Chitty exhibited specimens of *Gibbium scotias* and *Pentarthrum huttoni*, taken by Mr. Rye in a cellar in Shoe Lane. He stated that the *Gibbium scotias* lived in a mixture of beer and sawdust in the cellar, and that when this was cleaned out the beetles disappeared. The *Pentarthrum huttoni* lived in wood in the cellar. He also exhibited *Mezium affine*, taken by himself in a granary in Holborn.

Mr. McLachlan exhibited a large Noctuid moth, which had been placed in his hands by Mr. R. H. Scott, F.R.S., of the Meteorological Office. It was stated to have been taken at sea in the S. Atlantic, in about lat. 28° S. long. 26° W. Col. Swinhoe and the President made some remarks on the species, and on the migration of many species of Lepidoptera.

Mr. W. F. H. Blandford exhibited larvæ and pupæ of *Rhynchophorus palmarum*, L., the Gru-gru Worm of the West Indian Islands, which is eaten as a delicacy by the Negroes and by the French Creoles of Martinique. He stated that the existence of post-thoracic stigmata in the larva of *R. cruentatus* had been mentioned by Candèze, but denied by Leconte and Horn. They were certainly present in the larva of *R. palmarum*, but were very minute. He also exhibited a piece of a drawing-board, showing extensive injury by Longicorn larvæ during a period extending over seven years.

Mr. G. T. Porritt exhibited two varieties of *Arctia lubricipeda* from York; an olive-banded specimen of *Bombyx quercus* from Huddersfield; and a small melanic specimen of *Melanippe hastata* from Wharnccliffe Wood, Yorkshire.

Mr. H. Goss exhibited a few species of Lepidoptera, Coleoptera, Hemiptera, and Neuroptera, sent to him by Major G. H. Leathem, of the 31st Regiment, who had collected them, last June and July, whilst on a shooting expedition in Kashmere territory. Some of the specimens were taken by Major Leathem at an elevation of from 10,000 to 11,000

feet, but the majority were stated to have been collected in the Krishnye Valley, which drains the glaciers on the western slopes of the Nun Kun range. Mr. Elwes remarked that some of the butterflies were of great interest.

Mr. G. F. Hampson exhibited a curious form of *Parnassius*, taken by Sir Henry Jenkyns, K.C.B., on the 29th of June last, in the Gasterthal, Kandersteg.

Mr. J. M. Adye exhibited a long series of remarkable varieties of *Boarmia repandata*, taken last July in the New Forest.

Mr. C. O. Waterhouse exhibited a photograph of the middle of the eye of a male *Tabanus*, showing square and other forms of facets, multiplied 25 times.

Mr. Roland Trimen communicated a paper entitled "On some new, or imperfectly known, species of South African Butterflies," and the species described in this paper were exhibited.

Mr. T. D. A. Cockerell communicated a paper entitled "Two new species of *Pulvinaria* from Jamaica."

Mr. Martin Jacoby communicated a paper entitled "Descriptions of some new genera and new species of Halcidæ."

February 22.—HENRY JOHN ELWES, Esq., F.L.S., F.Z.S., President, in the chair.

Mr. Kenneth J. Morton, of Glenview Cottage, Carluke, N.B.; Herr A. F. Nonfried, of Rakonitz, Bohemia; and Mr. Charles B. Taylor, of Rae Town, Kingston, Jamaica, were elected Fellows of the Society.

Mr. F. J. Hanbury exhibited, on behalf of Mr. Percy H. Russ, of Sligo, several long and very variable series of *Agrotis tritici*, *A. valligera*, and *A. cursoria*, together with Irish forms of many other species, some of which were believed to be new to Ireland. Mr. W. H. B. Fletcher and Mr. J. W. Tutt made some remarks on the species.

Mr. R. W. Lloyd exhibited specimens of a species of *Acarus* found in New Zealand wheat. He stated that Mr. A. D. Michael had examined the specimens, and pronounced them to belong to *Tyroglyphus farinae*, a species which had been known for over a hundred years as a destroyer of corn, and was only too abundant all over Europe, and probably over the temperate regions of the world.

Dr. T. A. Chapman exhibited, by means of the oxy-hydrogen lantern, photographs of the larva of *Nemeobius lucina* in its first stage, showing the conjoined dorsal tubercles, each carrying two hairs, which are remarkable in being divided into two branches. For comparison he also showed, by means of the lantern, drawings of the young larva of *Papilio ajax*, after Scudder, and of a portion of a segment of *Smerinthus populi*, as the only instances known to him of similar dichotomous hairs in lepidopterous larvæ.

Mr. E. B. Poulton pointed out that he had described the forked hairs of *Smerinthus* in the Entomological Society's 'Transactions' for 1885, and that such hairs were even better developed in the genus *Hemaris* originally described, as he believed, by Curtis. Mr. Poulton also said that he had noticed similar forked hairs covering the newly hatched larvæ of *Geometra papilionaria*.

Mr. Poulton exhibited, and made remarks on, a number of cocoons of *Halias prasinana*, in order to show the changes of colour produced in them by their surroundings; he also exhibited the coloured backgrounds employed by him in his recent experiments on the colours of larvæ and pupæ, and illustrated his remarks by numerous drawings on the black-board.

Dr. Chapman read a paper—which was illustrated by the oxy-hydrogen lantern—entitled "On some neglected Points in the Structure of the Pupa of Heterocerous Lepidoptera and their Probable Value in Classification." A discussion ensued, in which Mr. Elwes, Mr. Poulton, Mr. Champion, and Mr. Merrifield took part.

Dr. F. A. Dixey communicated a paper entitled "On the Phylogenetic Significance of the Variations produced by Differences of Temperature on *Vanessa atalanta*." The President, Mr. Merrifield, Mr. Poulton, Dr. Chapman, and Mr. Tutt took part in the discussion which ensued.—H. Goss, *Hon. Sec.*

NOTICES OF NEW BOOKS.

Sporting Sketches in South America. By Admiral KENNEDY.
With map and illustrations. Post 8vo, pp. 1—269.
London: R. H. Porter. 1892.

THE name of Captain (now Admiral) Kennedy, R.N., has for some years been familiar to readers of 'The Field' and 'Land and Water,' as that of a pleasant and well-informed writer on sport in South America, that is to say, of such portions of that great continent as proved to be accessible to the enterprising commander of H.M.S. 'Ruby' while in discharge of his duties.

Capt. St. John, it will be remembered, similarly employed his leisure time when in command of a gunboat in Japanese waters, and, in a delightful book, 'The Wild Coasts of Nipon,' gave a most interesting account of his explorations. The world would be happier and wiser if the example of these two naval

officers were followed a little oftener. For there can be no doubt that such men have it in their power, without any detriment to the public service, to add much to our knowledge of Natural History. It must frequently happen that they could, if so minded, explore little known parts of a coast, or by means of some of the smaller rivers, penetrate into portions of the interior where the fauna and flora perhaps are undescribed.

The period covered by Admiral Kennedy's journal extended over three and a-half years, during which time he and his companions contrived to become acquainted with most of the large and small game of South America, including deer of three species, guanacos, wild cattle, wild goats, wild sheep, hares, Patagonian cavies, ostriches or rheas, three species of tinamu (the so-called South American partridge), and a great variety of snipe and wildfowl.

Although it is evident that these chapters have greater interest for sportsmen rather than for naturalists, we would by no means have it inferred that there is a want of accuracy in the autho'r's remarks on the latter subject, as is too often the case in books of a similar character. On the contrary, Admiral Kennedy seems to have made himself fairly well acquainted with the fauna of the districts he explored, and he is careful, for example, to explain that there are no true partridges in South America, although several species of tinamu are so designated. By the way, he might have spelt this name correctly, and be deemed to have known that there is no word of Spanish origin which terminates in *ou*; the *ú* in South America has the sound of *oo* in English. The Latinised form adopted for the generic name by ornithologists is *Tinamus*. The name *Tinamu*, according to Professor Newton, first appears in print in Barrère, 'Histoire Naturelle de la France Equinoxiale' (p. 138), published in Paris in 1741, whence, in 1778, it was adopted by Buffon (Hist. Nat. des Oiseaux, tome iv., p. 502), and in 1790 was Latinised by Latham in his 'Index Ornithologicus' (p. 633). A South American correspondent of the 'The Field,' writing with authority derived from personal acquaintance with the native haunts of this bird, states that the name is a corruption of the Guarani word *Inambu*.

The information supplied by Admiral Kennedy as to the game to be found in different districts, and the hints given

as to guns and rifles most suitable to sportsmen in South America, will be useful to those who wish to follow in his footsteps; and his chapters are certainly well worth reading by all who take an interest in sport abroad. The illustrations are the worst feature in the book, and it is no excuse to a critical reader to be told, in the preface, that the author is not an artist. The sketches reproduced should have been re-drawn, or omitted. The value of the book would have been enhanced, too, by the addition of an index; and the map which is given of South America would have been more useful, if the author had traced upon it a red route line, since a great number of place-names are shown of which no mention is to be found in the book.

Phases of Animal Life, Past and Present. By R. LYDEKKER, B.A. (Cantab.). Post 8vo, pp. 248. London: Longmans.

THIS is a collection of essays which appeared originally in 'Knowledge,' and deals with fossil as well as recent forms of life. They are intended to illustrate, in a popular manner, a few of the various modes in which animals—especially vertebrates—are adapted to similar conditions of existence; and also to demonstrate some of the more remarkable types of structure obtaining among the higher vertebrates. Thus, as regards the first-named group, we find chapters on Flying Animals, Swimming Animals, &c., showing the many ingenious contrivances of Nature for effecting the same or similar ends; in the latter group we have chapters on Giant Land Reptiles, Egg-laying Mammals or Montremes, Pouched Animals or Marsupials, Giant Birds, &c.

Mr. Lydekker is fortunate in possessing a knowledge of fossil as well as of recent forms, and being, therefore, able to see more clearly than most people the inter-relations of both. His remarks, accordingly, are very instructive, if not always exhaustive. It would have been useful had the reader been able to find references to important works on mammals where fuller details on some points might be found. Nevertheless, the book is full of information, and the illustrations for the most part are satisfactory. But why is there no Index?

The Birds of Lancashire. By F. S. MITCHELL. Second Edition, revised and annotated by HOWARD SAUNDERS, F.L.S., F.Z.S. 8vo, pp. 265. With map and illustrations. London: Gurney and Jackson. 1892.

THE first edition of this book, though of no exceptional merit, was soon dispersed, owing probably to the fact that the edition was a small one and the county a large one, wherein a greater number of people take an interest in Ornithology than is the case perhaps in any other county in England, except possibly Yorkshire. At any rate, in the interval which has elapsed since 1885, when the book first appeared, some interesting observations have been made on Lancashire birds, chiefly in the pages of 'The Zoologist,' and the new edition just revised by Mr. Howard Saunders, in the absence of the author from England, contains so many additional notes that it cannot be dispensed with even by those who possess the former one.

It seems to have escaped the notice of both author and editor that the scattered papers on Natural History by the late Thomas Garnett, of Low Moor, Clitheroe, were collected and reprinted, in 1883, in one volume, in which (at page 171) will be found the observations to which they allude (p. 70) on the alarm-note of one bird understood by other species. This volume might have been usefully consulted for ornithological notes made in Lancashire, and would have saved a laborious search through the earlier volumes of the 'Magazine of Natural History,' to which publication Mr. Garnett was in the habit of contributing.

As regards the species added to the Lancashire list in this new edition, the Purple Heron (p. 145) has evidently crept in by mistake, since Alderley Edge, where it is reported to have been shot, is in Cheshire, not Lancashire, and is at least seven miles from the border. No doubt the mistake arose from the fact that the original recorder (Zool. 1887, p. 432) wrote, "Alderley Edge, about thirteen miles from Manchester," which is misleading.

The next addition, the Sociable Plover, *Vanellus gregarius* (p. 213), is a remarkable one, as being the only known instance of the occurrence of this species in the British Islands. The bird in question, it appears, was included in the first edition of this work as a "Cream-coloured Courser," although how the

author could confound a four-toed Lapwing with a three-toed Courser, even in immature plumage, is not easy to understand.

The Cream-coloured Courser, accordingly, has been struck out of the Lancashire list, but with it, unfortunately, have gone the particulars relating to the bird which did duty for it, and which is reinstated under its right name! Obviously there are wanting on page 213 some words to the effect that the bird in question, which is in the immature plumage here figured, was shot among a lot of Lapwings near St. Michael's-on-Wyre, about the autumn of 1860, and is now in the possession of Mr. Joseph Frankland, adding his address.

The White-faced Petrel (*Procellaria marina*) or Frigate Petrel, as it is styled in Mr. Macpherson's 'Fauna of Lakeland,' where a coloured figure of it is given, appears to have but a very slender claim to recognition as a bird of Lancashire. Found dead and washed up by the tide on Walney Island, it may in this condition have travelled a considerable distance; so that it appears to be rather straining a point to include it as a visitor to a country which in all probability it never saw. Wilson's Petrel (p. 258) stands upon a different footing, and is not only an occasional wanderer to the British Islands, but probably occurs much oftener on the west coast of Ireland than is generally supposed. The Eared Grebe (p. 262) is also a genuine addition to the county avifauna, though only a single specimen is reported to have been met with.

We miss the two coloured plates of the Black-throated Wheatear and the Wall-Creeper, which embellished the first edition. Woodcuts of these two species are substituted, nicely drawn and engraved; but the tail of the former is too long in proportion to the wings, and is suggestive of a Wagtail rather than a Chat. In the coloured figure of the first edition the proportions are much more correct.

The folding map of the county is re-issued, with the addition of a little colour here and there at the mouth of the Ribble, the reason for which is not explained. As regards typography, paper, and general "get-up" of the volume, the second edition is much superior to the first, and brings the information as to Lancashire birds well up to date.

Manipulations de Zoologie, Animaux Vertébrés. Par le Dr. PAUL GIROD, Professeur-Adjoint à la Faculté des Sciences de Clermont-Ferrand. Paris: J. B. Baillière et Fils. 1892.

THE above-named volume is an Atlas of 32 process-plates, large octavo; and, except for the use of colour in the delineation of blood-vessels, it may be described as in method a sort of cross between Howes' 'Atlas of Elementary Biology' and Smith and Norwell's 'Illustrations of Zoology,' with few of the bad points of the latter. Indeed, many of the leading figures in the volume bear conspicuous traces not only of the influence of the first-named work, but of other well-known English laboratory-books.

The animals dealt with are as follows:—The Frog (9 plates), the Perch (7 plates), the Fowl and Rabbit (each 8 plates); they are presented in the order named, in accordance with a system which the author rightly defends in his preface. Each plate is accompanied by a concise description of its contents; and the first page or two of each section of the book are devoted to a short account of the habits of the animal under consideration, and of the best methods of capture, domestication, despatch, and preservation, with especial hints for manipulation in the laboratory. The more general directions for work, together with lists of apparatus, preservative fluids, &c., are embodied in the first thirteen pages of the book; but, while perfectly sound and thoroughly practical, they present no special novelties. The worker following this book will find Wickersheim's fluid a needless luxury, but the incorporation of directions for its preparation can do him no harm. He will be prone to enquire the reason of the needlessly gruesome directions for killing the unfortunate fowl and rabbit, after the experience he will have gained at the expense of their more lowly brethren.

The plates are exceptionally unequal, both in merit and in effect. The more diagrammatic among them are unquestionably the best; and in the needless elaboration of unimportant details the direct aim of many figures is lost. For example, in one case (pl. xi. fig. 1) the cut edge of a body-wall arrests the attention as an all-important structure; in another (pl. xxi. figs. 2 and 3) no one but an experienced anatomist could discriminate between the different parts depicted; while in a third (pl. xxvi. fig. 3) the area especially described as delineating characteristic structural detail, reveals a mere fluffiness of no certain signifi-

cance. Gross errors occur in places, as in the misrepresentation of the eleventh cranial nerve and of the quadrate element of the fowl. A glaring inconsistency presents itself in the introduction of the humerus, femur, tibia and fibula (the latter complete and distinct, *sic*) of the rabbit, to the exclusion of the radius and ulna and the pedal skeleton; and in this (pl. xxxii.) and certain other plates, the reference numbers or letters of some of the figures bear no relationship to the accompanying text. Although, in perpetrating these defects, the author has cast his lot with that of many an aspiring predecessor, he has carried the matter an interesting stage further. With the exception of plates xxv. and xxx., which bear no acknowledged authorship, all are admitted autogenous, with the help of Chauveau, Cuvier and Valenciennes, Huxley, and a certain Monsieur Beaunis, whose share in the responsibility can only have been an altogether insignificant one. There is, however, something very remarkable in the fact that the Huxleyan figures should be chiefly (Fowl's skull) the most insufficiently and erroneously lettered ones which the author could well have chosen, and that conspicuous among those which he attributes to his great countryman Chauveau, there should be a rabbit's blade-bone (pl. xxxii. fig. 1) having a broken spine—whereby it closely resembles that of a cat! We would earnestly recommend the latter very curious and fateful coincidence to the *chef* in search of authority.

The book abounds in minor incongruities and irregularities; and many of the illustrations bear unmistakable traces of the published works of certain English anatomists, as aforesaid. The author has apparently gone on the principle of copying with acknowledgment, but without correction, where a great name could be dragged in, and of copying with modification, and consequent non-recognition, where a lesser one was concerned. He has been curiously unfortunate in his first course, and has succeeded in diminishing the accuracy and utility of some of his best illustrations in his second. His attitude of mind is neither novel nor scientific; it is one, however, upon which the English reader has long passed judgment.

The book is the third published of a projected series of four, the third in order of which has yet to appear; and we earnestly recommend the above criticism to its author's serious attention.

THE ZOOLOGIST.

THIRD SERIES.

VOL. XVII.]

APRIL, 1893.

[No. 196.

THE PLAGUE OF FIELD VOLES IN SCOTLAND.

REPORT OF THE COMMITTEE APPOINTED BY THE BOARD OF AGRICULTURE.

THE Committee appointed to inquire into and report upon the circumstances attending the plague of voles in some of the southern counties of Scotland, and to ascertain, either experimentally or otherwise as they might determine, whether any, and, if so, what preventive and remedial measures could be adopted, having conducted their inquiry to certain conclusions, submit the following Report.

Before proceeding to the infected district we received evidence from Major Craigie, of the Intelligence Department of the Board of Agriculture, who stated that his attention had not been called to the existence of the plague of voles until the winter 1891-92, when it had been in existence for a considerable time. He laid before us the reports of two of the local inspectors of the Board, Mr. R. F. Dudgeon and Mr. J. I. Davidson, who, early in 1892, had been directed to inquire into the extent of the outbreak in the counties affected. We also received through the Office of Woods and Forests copies of correspondence relating to former outbreaks of the kind in England, and through the Foreign Office information of similar plagues in other European countries.

Hereafter, we proceeded to the infected district and received evidence from farmers, shepherds, land agents, gamekeepers, naturalists, and others at Howpasley on 20th June, at Hawick on 21st June, at Moffat on 22nd June, and at Thornhill on 23rd June.

We also inspected the farm of Howpasley, about twelve miles from Hawick, which was said to have suffered as severely as any from the ravages of voles.

Nature and Origin of the Plague.—The animal which by excessive multiplication has caused so much mischief on hill-farms in the southern uplands of Scotland is the Short-tailed Field Vole, *Arvicola agrestis*. Of this vole an excellent and exhaustive account was contributed to the 'Proceedings of the Berwickshire Naturalists' Club,' in 1878, by the late Sir Walter Elliot.

This Field Vole is at all seasons a well-known inhabitant of our pastures, and may be found at all heights from the sea-level to near the summits of our highest hills. The Chairman of the Committee saw one in the autumn of 1891 at a height of 2000 feet on Ben Eibhinn, in Strath Ossian. The attention of farmers and shepherds is only attracted to it when circumstances have combined to cause an abnormal increase in its numbers. One shepherd stated that when as a boy he used to find a nest of voles he would "hap" (protect) it, because it was thought rare.

The Field Vole usually produces three or four litters a year, each consisting of from four to eight young, but in some seasons they are even more prolific, the breeding season is prolonged, young voles being observed from February to November, and the litters containing as many as ten young. Mr. Service, of Maxwelltown, a local naturalist and careful observer, mentioned in his evidence that he had observed females suckling young while in a pregnant state.

The present outbreak may be traced back to the year 1888, when the voles were observed to be increasing on the farm of Glenkerry and others in Selkirkshire. In the summer of 1889 the low-lying pastures near Closeburn, in Dumfriesshire, were observed to be infested by enormous numbers of voles, which remained there during 1890, and disappeared in 1891, probably moving up to the hill-pastures, where at the time of the Committee's visit they were swarming.

On some of the hill-farms this excessive increase was observed as early as the autumn of 1890; elsewhere, however, they attracted no attention till the spring of 1891. The districts principally affected are the hill-pastures in the north-west of Roxburghshire, the south of the counties of Selkirk, Peebles, and Lanark, and the northern part of Dumfries from Eskdalemuir by Moffat to

Thornhill. The voles have also appeared in great numbers in the parishes of Dalry and Carsphairn, in the stewartry of Kirkcudbright.

Mr. R. F. Dudgeon, at the date of his report, estimated that in Roxburghshire 30,000 to 40,000 acres had been affected, of which he considered 12,000 to 15,000 acres had been rendered useless; in Dumfriesshire 40,000 to 50,000 acres, and in the stewartry of Kirkcudbright 10,000 to 12,000 acres were described by him as infested by voles.

The Committee received no estimate of the area affected in the counties of Selkirk, Peebles, and Lanark, nor had they the means of verifying Mr. Dudgeon's calculation in respect to the other counties affected, but an area not less than sixty miles in length and from twelve to twenty miles in breadth has been overrun.

Causes of the Outbreak.—The rapid increase in the number of voles to the dimensions of a plague was attributed by all the witnesses examined to one of two causes, or to a combination of both. The first of these consists in the character of the seasons. Mr. Service called attention to the occurrence of a series of dry springs in 1890, 1891, and 1892, adducing figures to show that the rainfall in these seasons was very much below the average, and therefore favourable, in his opinion, to the breeding of small mammals. The autumn of 1890 was unusually wet, producing great luxuriance of grass on the hill-pastures, which afforded abundant shelter for the voles. The winter which followed, though very severe in England, was a mild one in Scotland. Sir Walter Elliot traced the cause of the outbreak of voles which took place in 1876 to the unusual mildness of the four or five winters preceding that year.

The second cause assigned by witnesses is the destruction of hawks, buzzards, owls, stoats, and weasels by persons interested in the preservation of game. Major Craigie had previously stated that "a preponderance of opinion amongst farmers is reported, tracing the cause of the present outbreak to the scarcity of owls, kestrels, hawks, weasels, and other vermin." Of the prevalence of this opinion the Committee were made fully aware, nearly every witness who was examined giving it as his belief that the outbreak was due to the destruction of the "natural enemies" of the voles. A similar view was expressed by the witnesses before the Com-

mittee of the Tiviotdale Farmers' Club appointed to inquire into the cause of the outbreak in 1876; but Sir Walter Elliot stated that much weight was not attached to this "popular opinion . . . because no more hawks, owls, weasels, &c., had been destroyed than usual." They had, in fact (to use Sir Walter Elliot's own words), "been well nigh extirpated long before the outbreak took place."

Effect upon the Pasture.—Of the damage done to the hill-pastures the Committee had ocular demonstration during their visit to Howpasley farm (3000 acres), and nothing short of personal inspection could have given them an adequate idea of the extent of the mischief. The voles had shown themselves there first in what is called the "bog" land—*i. e.*, strong marshy land either grazed or cut for hay. Having devoured the grass there, they spread to the "bent," "lea," or dry hill-pasture, and to the heather, which they destroyed as effectually as they had done the grass. The stem of the grass is eaten close to the ground where it is white and tender, leaving the blade above withered and useless. Plantations are sometimes attacked, the young trees being peeled and killed, but this has not been the case so much during the present outbreak as in former years. The arable land, so far, has not been much affected, but there is no doubt from the experience of Mr. Oliver, who had three acres of corn damaged by them, that, if unchecked, they might swarm upon the cultivated ground with disastrous effect. Indeed, the Committee received information to the effect that in some districts they appeared in numbers in the harvest fields.

In walking across the hill the Committee saw numbers of voles darting about in every direction, and caught several for examination. The grass, which, at the end of June, should have been in full flush of verdure, was lying in withered wisps over a large extent of the farm, and the heather, which is valuable for winter feeding of the stock, had suffered to a similar extent.

Effect on the Stock.—Numerous witnesses spoke to the injury to stock owing to the damaged pasture. This injury was twofold, consisting first in the low condition to which the ewes were reduced, at and after lambing, from insufficiency of food, and the consequent increase of death rate among them; and secondly, in a diminution in the crop of lambs, and deterioration in their quality.

Admitting the serious injury done to the pasture by voles, to which the Committee can testify from personal inspection, it is difficult to avoid the conclusion that the sheep dependent on that pasture must have suffered to a considerable extent. To quote Sir Walter Elliot's words:—

“The importance of these early grasses to flocks emaciated by previous scanty fare, at a time when the ewes, gravid with young, require more than ordinary nourishment to enable them to rear their lambs, explains how disastrous any diminution in their still scanty food might prove, whether from severity of weather, or other unusual cause, such as the swarming of the voles.”

But it is not easy to estimate the extent to which the death rate of the ewes was increased, or the crop of lambs diminished as the direct result of scarcity of pasture caused by the voles.

All witnesses from the infested farms testified to the low condition of the ewes at the time the Committee visited the district, but they varied greatly in their estimate of the increased death rate. One farmer, in the Hawick district, put the deaths at six per cent. above an average, while the tenant of Middlegill, and the shepherd of Medlock, both near Moffat, averred that it had been doubled. The tenant of Ettrick Hall, in the Hawick district, lost 140 ewes out of 1000, whereas the average death rate for the last five years was 45. The tenant of Nether Cassock, in Eskdalemuir, estimated the deterioration on 3000 sheep at 2s. a head in 1891, and at 4s. a head in 1892, or £900 in two years.

The crop of lambs appears to have seriously diminished in consequence of the low condition of the ewes. The shepherd of Rushiegreen, near Hawick, stated that 1400 or 1500 ewes produced 344 lambs fewer than the average. The tenant of Ettrick Hall and Nether Hall, in Selkirkshire, had only 333 lambs, whereas an average would be from 600 to 700. In Dumfriesshire, the tenant of Barr, near Sanquhar, said he had only 60 lambs per 100 ewes, the average being 90. The deficiency was variously calculated at from 15 to 50 per cent. below the average.

In addition to the direct loss suffered by death among the ewes and failure in the lamb crop, there must be reckoned the extra expense incurred in hand-feeding as a substitute for natural pasture. The tenant of Eilrig (1100 acres, present rent £255 10s.) put down the extra cost of this during the winter and spring 1891-92 at £120. The tenant of Howpasley (3000 acres), in

Roxburghshire, calculated his extra expenditure at £144; the tenant of Ettrick Hall and Nether Hall (2400 acres), in Selkirkshire, reckoned that he had spent £100 since January, 1892; while the tenant of Nether Cassock and Glenderg, in Eskdalemuir (6500 acres), estimated the cost of hay and corn supplied during two seasons at £1200. The tenant of Kinnelhead, near Moffat, claimed to have lost £1013 in two years by deaths and cost of hand-feeding. It appears that hand-feeding is never resorted to, unless in exceptional circumstances, such as a prolonged snow-storm, or a failure of pasture such as has been caused by the voles.

Of course, in weighing evidence as to losses by death of ewes and deficiency of lambs, it is necessary to take into account the character of the season. The general testimony throughout the several counties was to the effect that, but for the voles, the lambing season would have been a favourable one, both among Cheviot and black-faced stock. Only two witnesses held a contrary opinion, one an assistant in a land agent's office, the other the tenant of a farm in the Leadhills district.

In order to elicit more general opinion on this subject, the Committee caused a schedule of questions to be circulated among hill-farmers in districts not affected by voles. Nineteen of these were filled up and returned with the following result as to the character of the lambing season:—Very good, 2; good, 6; average, 7; bad, 4.

On the whole, therefore, it may be assumed that the lambing season of 1892 in the south of Scotland was fully of an average character, and the extraordinary death rate among ewes and deterioration in the number and quality of lambs is to be attributed to the scarcity of grass caused by the ravages of the voles.

Remedies.—No concerted or systematic attempt to stamp out the plague in its earlier stages seems to have been undertaken by the farmers of the district affected, and this is the more remarkable because some of them, at all events, had the bitter experience of the outbreak of 1875-76 to warn them of the serious results of allowing the voles to get ahead. Isolated efforts were made by some tenants to rid their land of voles by burning the grass and heather, by killing them with men and dogs, by turning out cats, and by poison; but the effect of such piecemeal endeavours seems

to have been well nigh inappreciable. The Committee are not prepared to declare that landowners and farmers could have arrested the plague, but they hold a very strong opinion that the best chance of averting its disastrous effects would have been for all interested in the ownership and occupation of land to have combined for the destruction of the voles when they were first observed to increase.

Burning bog land, bent, and heather, seem to be effective in driving the voles off the portions burnt. Mr. Carthew Yorstoun, Commissioner on the Duke of Buccleuch's Langholm estate, stated that he had written to every tenant of a hill-farm in 1892, asking if an extension of the time for burning would be an advantage. Three-fourths of those written to replied in the affirmative, and received permission to burn from 14th April (the usual limit) to 28th. The remaining fourth said they had already burned as much as the ground would stand. It is not profitable to burn all the rough pasture on a farm, as the sheep depend on it for sustenance when snow is on the ground.

Poison has been tried with very partial success. Samples of grain treated with strychnine, and coloured red to prevent mistakes, were supplied from Germany and submitted. It is stated that good results were obtained with this in limited areas; for instance, the tenant of Middlegill, near Moffat, holding a farm of 3000 acres, applied this poison to a meadow of ten acres, and thereby partly destroyed the voles. Sir Walter Elliot quoted a letter from Sir Robert Menzies, who describes how he got rid of the voles which infested 140 acres of Scots fir-plantation, by laying down half a ton of half-inch drain pipes, in each of which was placed a teaspoonful of oatmeal mixed with phosphorus. But, for obvious reasons, the application of poisoned grain over hill-farms, extending to many thousands of acres, even if practicable, would be attended with much risk to other forms of life.

Pitfalls—*i. e.*, holes cut in the ground with precipitous sides—are equally out of the question when a large tract of country has to be dealt with. But they have proved effectual when plantations of limited extent have been attacked. The forester at Branxholm within a week exterminated the voles infesting a plantation of six acres, by digging pits 12 inches wide at the mouth, 15 in. wide at the bottom, and 18 in. deep. These were placed at a

distance of from 12 to 20 ft. apart. On the other hand, the head-keeper at Drumlanrig said that pitfalls had been tried without much success in the extensive plantations at that place. As a remedy on sheep farms, pitfalls were graphically appraised thus by Mr. Whittle—"How many holes . . . would it take to cover my farm of 7600 acres, and what would be the cost?"

The same objection—namely, the nature and extent of the ground affected—applies to the proposal of other expedients which have been resorted to in various parts of the Continent, *viz.*, passing a heavy roller over the ground, trampling it with cavalry, inundating it, injecting water, steam, or noxious fumes into the runs. All of these may be dismissed as wholly impracticable.

Large numbers of voles were destroyed on some farms by men and dogs. The vole is extremely rapid in its movements and difficult to hit with a stick. A more effective weapon is a wooden implement shaped like a small spade. The tenant of West Buccleuch, in Selkirkshire, killed by this means 13,000 in three months on 3000 acres; the tenant of Glenkerry (3000 acres) employed a man who killed 15,000 in one month, or about 450 per diem. The tenant of Langshawburn hired a man with twelve terriers, who killed from 400 to 600 a day on 4260 acres. In addition he turned out 100 cats, and by the end of June, 1892, reported that there was not one vole for every 100 that there had been on his ground.

There can be little doubt that simultaneous and combined action of this sort on the part of owners and occupiers, aided by timely and judicious burning *in the earlier stages of the outbreak*, is the most effective method of staying the ravages of the plague. Unfortunately, not only have these exertions been hitherto isolated and intermittent, but they have been delayed until the voles were swarming over a considerable extent of ground.

Previous Outbreaks.—There is abundant evidence to prove that in former times, not only in this country but in many other lands, the excessive pullulation of small rodents has from time to time amounted to a plague.

A passage in Holinshed's 'Chronicle' is worth quoting here, because it records a visitation of Owls similar to that which has taken place in the Border counties during the present outbreak:—

“About Hallontide last past (1581), in the marshes of Danesey Hundred, in a place called South Minster, in the county of Essex . . . there sodainlie appeared an infinite number of mice, which overwhelming the whole earth in the said marshes, did sheare and gnaw the grass by the rootes, spoyling and tainting the same with their venomous teeth, in such sort that the cattell which grazed thereon were smitten with a murraine and died thereof; which vermine by policie of man could not be destroyed, till at the last there flocked together such a number of owles as all the shire was not able to yield, whereby the marshholders were shortly delivered from the vexation of the said mice.”

Stowe, quoting this account in 1615, adds, “the like of this was also in Kent.” Childrey, in his ‘*Britannia Baconica*,’ 1660, records another outbreak in Essex in 1648, and, referring to the former plague in 1581, remarks that it took place in “an extreme dripping warm year and a mild and moist winter.”

Lilly mentions an invasion as having taken place in Essex in 1660; and Fuller, writing in 1662, says:—

“I wish the sad casualties may never return which lately have happened in this county (Essex), the one in 1581, in the Hundred of Dengy; the other in 1648 in the Hundred of Rochford and Isle of Foulness (rented in part by two of my credible parishioners, who attested it, having paid dear for the truth thereof), when an army of mice, resting in the anthills, as conies in burrows, shaved off the grass at the bare roots, which withering to dung, was infectious to cattle. In March following numberless flocks of owls from all parts flew thither and destroyed them, which otherwise had ruined the country if continuing another year.”

In 1754, as appears by the ‘*London Magazine*’ for that year, and the ‘*Gentleman’s Magazine*’ (p. 215), a similar occurrence was noted at Downham Market, Norfolk.

Montagu, in the Supplement to his ‘*Ornithological Dictionary*’ (1813), quotes Mr. Anstice’s description of a plague of mice a few years previously at Bridgewater, followed in like manner by flights of Short-eared Owls.

Other outbreaks occurred in the Forest of Dean and the New Forest in 1813–14, and are fully described in a letter from the late Lord Glenbervie, Surveyor-General of Woods, printed in the Appendix to this Report. In 1836 the Forest of Dean was again infested, but there is some reason to suppose that on this occasion part at least of the mischief was attributable to the Long-tailed Field Mouse, *Mus sylvaticus*.

Destructive visitations of voles took place in 1825, in the oak-coppices of Cameron, Dumbartonshire; and in 1864—67 in the woods of Drumlanrig, Dumfriesshire, when the oak, holly, and ash suffered severely, but the fir and mountain ash were spared. On the other hand, in 1863—64, on the estate of Rannoch, Perthshire, Sir Robert Menzies stated that his woods suffered severely, but that the Scots firs only were attacked.

Finally, there was the serious outbreak on the hill-pastures of Roxburghshire and small portions of Dumfriesshire in 1875—76, by which much of the land suffering under the present visitation was overrun. This is fully described in Sir Walter Elliot's paper above referred to.

Foreign countries have suffered severely under the scourge of swarms of voles nearly akin to, though some of them not identical with, the British species. Simultaneously with the outbreak in Roxburghshire in 1875—76, the corn-lands of Galicia and Hungary were infested by swarms of *Arvicola arvalis*.

During 1891—92 the province of Thessaly was invaded by a plague of rodents, supposed at first to be *Arvicola Savii*, but subsequently identified as *Arvicola Güntheri* (Danford, Proc. Zool. Soc. 1880, p. 62, pl. v.).

In the American continent, also, the land is subject to similar visitations. In his 'Naturalist in La Plata,' Mr. W. H. Hudson gives a graphic description of the Pampas being overrun by swarms of a species of Field Mouse (*Hesperomys*), and mentions the usual concomitant of extraordinary numbers of Short-eared Owls which preyed upon them. In this, as in most of the instances recorded, there is evidence to show that the voles disappeared rapidly, almost suddenly, whether from stress of weather, epizootic disease, or other causes.

Natural Enemies of the Vole.—No phenomenon in connection with the present plague of Field Voles in Scotland has been more marked than the presence of large numbers of the Short-eared Owl, *Otus brachyotus*. This bird, which is distributed over almost every part of the globe, is a normal winter migrant to these islands, appearing simultaneously with the Woodcock (whence it is popularly known as the "Woodcock Owl"), and usually departing in spring. Nests in ordinary seasons are of comparatively rare occurrence in Great Britain; but in consequence of the vast multiplication of their favourite food, the vole, these Owls have

not only arrived in unusual numbers, but have remained and bred freely all over the district affected, laying from eight to thirteen eggs (though Prof. Newton, in his edition of Yarrell's 'British Birds,' mentions seven as an unusual number), and rearing more than one brood. The shepherd on Crooked-stone, near Crauford, counted fourteen nests on his ground. The small wood behind the farm-steading of Howpasley presented a remarkable appearance, the ground being densely covered with the "pellets" or "castings" of owls, composed of the fur and bones of voles. Living specimens of both old and young Short-eared Owls were produced for the inspection of the Committee at Howpasley.

The Short-eared Owl differs from most other Owls in that he hunts in daylight, and his operations can be observed; but there is no doubt that the nocturnal species are equally useful to the farmer in destroying small rodents, and it would be difficult to condemn too severely the foolish and cruel action of those who allow or encourage the destruction of this useful and beautiful family of birds. It is with much satisfaction that the Committee record that many landowners and game preservers seem to have become convinced in late years that Owls of all sorts are not only harmless to game but most beneficial to agriculturists, and have issued orders for the preservation of these birds.

Next, and hardly second in merit, as a check upon voles and mice, comes the Kestrel, *Falco tinnunculus*, and it is to be deplored that popular ignorance as to its food and habits is even greater than that which prevails in regard to owls. This bird, although possessing the long wings and dark eyes characteristic of a true falcon, is known to gamekeepers as a hawk—*noscitur a sociis*; its death-warrant is a standing order in most preserves, though here again there has been some improvement, and the destruction of the Kestrel is forbidden on some estates. The food of this bird is known to consist almost exclusively of mice, grasshoppers, coleopterous insects, and their larvæ.

It is true that one witness, a tenant of shootings, stated his belief that the Kestrel is a "deadly enemy of game," that one of this species took seventy young pheasants from the coops, and was shot one evening in the act of carrying off a young pheasant. But he was not speaking from observation, but from the report of his keeper, and there is little doubt that Kestrels are often

attracted to pheasant coops by the presence of rats and mice drawn thither by the food prepared for the young birds. Against this may be set the evidence of the head-keeper at Drumlanrig (where Kestrels are preserved by order of the Duke of Buccleuch), who said that in his experience of over thirty years he thought he could remember twice seeing a Kestrel taking a young pheasant.

It will be a very gratifying result of the present inquiry if it tends to persuade persons interested in game preserving that the Kestrel preys not so much on game as on the vermin of the farm.

It may be observed, in connection with this question of the Kestrel's habits, that it is rare to find people able to distinguish between one kind of hawk and another. Few of the witnesses before the Committee were able to describe hawks otherwise than as red, blue, brown, or yellow, and it was often impossible to make out what species they intended to indicate. It is one of the peculiarities of the *Falconidæ* that their plumage varies according to age and sex. In the southern counties of Scotland the Sparrowhawk (which does not prey on mice) is generally known as the "blue hawk," and the Kestrel as the "brown" or "red" hawk. But an immature male Sparrowhawk has reddish brown plumage, and an adult male Kestrel a bluish grey head, lower back, and tail.

Several witnesses deponed to an increase in hawks "since the mice came," but were unable to identify the species. No doubt they were Kestrels, for other species of hawks do not commonly prey on mice, and the Committee, in driving back from Howpasley, observed five Kestrels together hovering over the vole-haunted ground.

Buzzards probably destroy large numbers of voles and mice, and are too heavy on the wing to do much injury to winged game; but they have become very scarce in southern Scotland, owing to their destruction by gamekeepers.

Ravens and Hooded Crows have also become rare, but this cannot be regretted in the farmer's interest, as they attack young lambs, and even pick the eyes out of the weakly ewes. Moreover the Rooks, which it is to be hoped no short-sighted policy will greatly reduce in numbers, have done excellent service in digging up the voles' nests and devouring the young.

Mr. Service, of Maxwelltown, drew attention to a change which had taken place in the habit of Rooks in his neighbour-

hood during the last ten years, having "developed most marked carnivorous habits, taking eggs, young birds, young poultry, young hares and rabbits, to an extent they never did before." Simultaneously with this manifestation of Carrion Crow-like habits, Mr. Service had noticed an increase in the number of Rooks with feathered faces like the Carrion Crow, which he was inclined to connect with the change of their diet. (See Stevenson's 'Birds of Norfolk,' vol. i. pp. 274, 275.)

This alleged modification in the habits of the Rook, though favourable to the farmer, has not unreasonably brought him into evil repute with game-preservers.

Amongst other birds which have been observed to prey on voles are certain species of Sea-gull.

Stoats and Weasels are among the deadliest and most persevering enemies of small rodents. They kill far more than they can devour, apparently out of sheer blood-thirstiness. In woodlands and on low ground they undoubtedly do much harm to game, especially the Stoat, which may be easily distinguished from the Weasel (known in Scotland as the "whittret") by its greater size and by the black tuft at the end of the tail, which is retained at all seasons of the year, even in winter, when the rest of the body becomes wholly or partially white.

Adders feed readily on voles, and in July, 1892, the Chairman of the Committee was present when one was killed with a vole in its gullet. This was in Wigtonshire, where no abnormal increase in the number of voles has been observed. But a single Adder would probably not kill more than one animal of the size of a vole in a single day: so there is no reason to extend protection to these venomous reptiles.

Some naturalists aver that the Mole preys upon voles; but the Committee, though directing inquiries upon this point, were unable to elicit any evidence tending to confirm this belief.

The popular opinion that the excessive multiplication of Field Voles is the direct result of the destruction of birds of prey, Stoats and Weasels, which has been admittedly great over part of the affected area, does not appear to be generally the outcome of personal accurate observation.

The Committee are of opinion that birds and beasts of prey, even had they been wholly unmolested, would not have prevailed to avert the vole plague, though they would probably have greatly

mitigated its severity, and they are confirmed in this view by the circumstances attending similar outbreaks in this country in the 16th and 17th centuries, and in foreign countries of late years. Neither in Essex, previous to the outbreak reported by Hollinshed, nor in South America previous to the outbreak of Field Mice described by Mr. Hudson in the 'Naturalist in La Plata,' nor in Thessaly, previous to that prevalent there in 1891-92, was there any check placed by man upon the multiplication of the natural enemies of these rodents.

In reply to the question (*inter alia*) whether "birds of prey and other rapacious animals have assisted to any material extent in the destruction of the voles (in Thessaly)," Her Majesty's Minister at Athens replied, "Birds of prey and other rapacious animals would never suffice to prevent the alarming multiplication of the voles under favourable climatic conditions."

This view has been amply confirmed by the observations of the Chairman and Secretary of the Committee during their recent visit to the infested plains of Thessaly. Birds of prey—eagles, buzzards, kites, kestrels, and other hawks—are exceedingly abundant there, and no one thinks of molesting them. Indeed, the Turks (of whom there are about 30,000 in the province) are exceedingly kind to wild animals, and object to their being destroyed. In 1866, when that country last suffered from a visitation of Field Voles, Thessaly was under Turkish dominion, and birds of prey were protected. The change from Turkish to Greek rule, which took place in 1881, made no difference in this respect, yet in favourable seasons the voles multiply in spite of the presence of a very full stock of their natural enemies.

Conclusions and Recommendations.—The Committee have reluctantly been led to the conclusion that they are unable to recommend any specific method of dealing with or putting an end to the present outbreak. It appears to be an instance of the power which small animals are well known to possess, of prodigiously rapid multiplication under favourable climatic conditions and with a plentiful supply of natural food.

Experience shows that a combination of such favourable conditions will always tend to bring about a recurrence of the plague. That being so, it ought to be the endeavour of every farmer and shepherd to be on the alert, and report without delay to the land agent, and to the secretary of the local farmers' club

or agricultural society, the first signs of the multiplication of vermin, so that palliative measures may at once be adopted, not on isolated farms, but everywhere throughout the district.

The most effective measures appear to be periodical and timely *burning* of grass and heather, followed by active pursuit of the vermin by men using wooden spades and dogs. If this were promptly done in the earlier stages of the outbreak, it is quite possible that it might be averted altogether, or greatly mitigated in severity.

It is hardly necessary to point out that the proprietor of the land should be informed as soon as anyone else, because his keepers and others might be usefully employed in assisting to prevent what amounts, if unchecked, to a common calamity upon all classes connected with land.

Where plantations of limited extent are attacked, *pitfalls* wider at the bottom than at the top, and about eighteen inches deep, should be dug. The voles fall into them and cannot escape, and the ground is soon cleared of them in this way.

The Committee cannot speak with approval of the use of *poisoned grain*, except where the area affected is very limited.

Nor have they been able to come to any conclusion favourable to the adoption of *Professor Loeffler's method* of destroying voles by means of bread saturated in a preparation of the *bacillus typhi murium*, or mouse typhus. The personal investigations made by the Chairman and Secretary in Thessaly (where in May, 1892, Prof. Loeffler was employed at the expense of the Greek Government to combat the plague of Field Voles then prevailing in that country) convinced them that the favourable reports circulated as to the complete success of the experiments have not been justified by the results. In certain parts of Thessaly the voles were reported by landowners and others to be as numerous in January, 1893, as ever they were.

The Committee readily admit that when used in a fresh state the bacilliferous fluid is an effective though somewhat dilatory poison for mice or voles, and has this advantage over mineral poisons, that, as has been proved, it is innocuous to human and other forms of life.

It has been reported by Prof. Loeffler that the Scottish voles sent to him alive by instructions from the Committee have been found as susceptible of the mouse typhus-bacillus as their Greek

congeners. But there are three objections which in the opinion of the Committee render this method almost worthless, except for employment in houses, gardens, enclosed fields, or other limited areas:—

(1). It is very expensive; the virus supplied to the Greek Government was paid for at the rate of about 4s. a tube, containing enough when dissolved to treat about two imperial acres—a cost which in many instances would exceed the rent of the Scottish hill-pasture. To this must be added the price of bread used in distributing the virus, which would appreciably raise the cost of the process. Thus to deal effectually with a hill-farm of (say) 6000 acres, would entail an expenditure of from £700 to £1000, making the remedy more costly than the evil.

(2). Mouse-typhus is not contagious; it can only be communicated to those animals that will swallow some of the virus. The allegation that healthy voles will become infected by devouring the bodies of the dead has not been satisfactorily proved. That Greek voles when in captivity have been observed to feed upon the corpses of their fellows hardly warrants the assumption that Scottish voles in a state of liberty will do the same; and unless the disease were communicable from one animal to the other, it is not easy to see how the remedy could prove effective on extensive hill-pastures.

(3). The fluid loses its value in about eight days after preparation. Consequently much disappointment might ensue if, after a supply had been obtained, a fall of snow or wet weather were to interfere with its distribution over the land.

The remedy which has been found most effectual in Thessaly is an injection of the fumes of *bisulphide of carbon* into the burrows. This, however, is a more expensive process than the other, besides being injurious to the health of those engaged in its application. It is, moreover, inapplicable to the Scottish vole (*Arvicola agrestis*), which does not burrow to a depth like the vole of Thessaly (*Arvicola Güntheri*), but lives in shallow runs amongst the roots of herbage.

With the under-noted exceptions, the natural enemies of the voles may be divided into two classes, *viz.*, those which destroy the voles and are harmless to sheep, crops, and game; and those which, through preying on voles, are so hurtful in other ways as to have no claim to preservation:—

- | | |
|---|---|
| (i.) <i>Vole-killers, harmless or nearly so, to sheep, crops, and game.</i> | (ii.) <i>Vole-killers, hurtful in other ways.</i> |
| Owls of all sorts,
Buzzards,
Kestrels,
and the smaller Sea-Gulls. | Foxes,
Ravens,
Carrion and Hooded Crows,
Great Black-backed Gull,
and Adders. |

Strict injunctions ought to be given by landowners that the birds mentioned in the first class should not be destroyed. Their presence in full numbers, though inadequate to avert an outbreak, would undoubtedly tend to mitigate it, and, as has been proved in the case of the Short-eared Owl, they have the faculty of multiplying abnormally in presence of an unusual supply of food. They are at all events most useful allies to man in combatting attacks of ground vermin.

The Committee further desire to deprecate in the strongest manner possible the use of the pole-trap for the capture of hawks. Besides the inhumanity of this device, it is indiscriminate, and harmless Owls, Kestrels, and Buzzards are just as likely to be taken by it as are the more mischievous species.

Three animals, diligent vole-destroyers, have been omitted from both these lists, because they are undoubtedly hurtful to game. The first of these is the common Rook (known to the shepherds as the "Corn Crow"), of which, however, the services to agriculture are now generally recognised.

The other two animals referred to are the Stoat and the Weasel. Of all the smaller beasts of prey these are perhaps the most hateful to gamekeepers, and it is hardly reasonable to expect that Stoats should be allowed to multiply in game-coverts, or in the vicinity of pheasant-coops. But the Committee have no hesitation in recommending that Weasels, which are persistent mouse-hunters and do little damage to game, should not be molested, at least on moorlands and hill-pastures, where they can do little harm and much good.

The Committee cannot conclude their labours without expressing gratitude for the consideration with which they were everywhere received in the course of their inquiry; for the hospitality shown to them; and for the exertions made by various individuals to obtain witnesses and arrange their evidence.

HERBERT EUSTACE MAXWELL (Chairman).

MINTO.

D'ARCY W. THOMPSON.

JOHN GILLESPIE.

WALTER ELLIOT.

J. E. HARTING (Secretary).

The printed evidence which follows the Report extends to upwards of sixty folio pages, and is succeeded by the following Appendices:—

- I. Major Craigie's Report of March, 1892, including those of the Inspectors to the Board of Agriculture.
- II. Lord Glenbervie's Account of the Devastations of Field Mice in the Forest of Dean and in the New Forest in 1813-14.
- III. Sir Walter Elliott's Account of the Plague of Field Mice on the Border Farms in 1876-77.
- IV. Foreign Correspondence, including an article by Dr. Gennadius, Director of the Department of Agriculture in Greece, on a plague of Voles in Thessaly.
- V. Statement of Rainfall in Kirkcudbrightshire, 1861-92, referred to in the evidence of Mr. Robert Service.
- VI. Reports by Professor Loeffler (1) on the results of laboratory experiments made by him on Mice and Voles with the *bacillus typhi murium*; (2) on the plague of Voles in Thessaly and its supposed counteraction by the *bacillus typhi murium*.
- VII. Account of a Plague of Field Mice observed in La Plata by Mr. W. H. Hudson.
- VIII. Memorandum by the Chairman upon a visit to Thessaly in January, 1893, for the purpose of surveying the Vole-infested district and taking evidence as to the outbreak and spread of the plague, and the results of experiments made with a view to counteract it.

In addition to these Appendices, there is a very full "Subject Index" to the evidence, and the Report is illustrated by four plates containing figures of (1) the Short-tailed Vole, and Long-tailed Field Mouse; (2) the Weasel and Stoat; (3) the Kestrel and Sparrowhawk; (4) the Short-eared Owl, and heads of old and young Rooks. At the end is a folding map of the Scottish counties affected by the plague, wherein every locality mentioned in the evidence is underlined with red-ink for convenience of reference.

OBSERVATIONS ON THE COMMON FIELD VOLE OF
THESSALY.

BY THE EDITOR.

VERY little attention seems to have been paid to the smaller mammals of Greece, if we consider how little has been published concerning them. Indeed the literature dealing with the Vertebrate fauna of that country is of the scantiest nature, and relates chiefly to the Birds, of which no very recent account has appeared.

The Greeks are not naturalists by taste or inclination, and, to judge by the present state of the Zoological Museum at Athens, there would seem to be few collectors, and still fewer modern observers, from whom any reliable information of this kind is to be obtained.

During a recent visit to Athens, and to Larissa, the capital of Eastern Thessaly, I lost no opportunity of interrogating the natives as to the birds and beasts to be met with, and was everywhere struck with the ignorance displayed on this subject, and the general indifference which prevailed respecting it.

It was not until we reached the great plain of Larissa, where a plague of Field Voles has been for some time manifest, that we encountered those who could impart some information on at least one small indigenous mammal, namely, that which was causing such mischief and pecuniary loss to the resident land-owners. That it was a Vole (*Arvicola*) of some sort was certain; but as to the precise species some difference of opinion had been expressed.

Dr. Gennadius, the Director of the Department of Agriculture in Greece, in an article entitled "Les Campagnols en Thessalie," published in the 'Journal d'Agriculture Pratique' (March 19th, 1892), wrote: "Les campagnols de la Thessalie paraissent être indigènes et appartiennent selon toute probabilité à l'espèce de Savi, *Arvicola* ou *Microtus Savii*."

When Prof. Loeffler, on the recommendation of M. Pasteur, was invited last year, by the Greek Government, to visit Thessaly for the purpose of endeavouring to combat the plague of Voles there, by inoculating them with the *bacillus typhi murium*, he was under the impression that the species might be identical with that which had some time previously devastated parts of Germany,

namely, *Arvicola arvalis*, and, as it was important to him to discover whether this was so, he telegraphed to Athens as follows:—“Before I start with my assistant, I should like to be certain that the Field Vole in question is *Arvicola arvalis*. The species is very important, as I have only established the action of the bacillus in *Arvicola arvalis*. Please enquire in Athens, and let me know.”

The reply he received was as follows:—“It is *Arvicola arvalis*, called Campagnol in French.”

Although this determination subsequently proved to be erroneous, the species in question appeared to be equally susceptible to the action of the virus, as did the German examples of *A. arvalis* and the Scottish examples of *A. agrestis*, upon which Prof. Loeffler experimented in his laboratory at Greifswald.

On reaching the field of his operations in Thessaly, as he tells us in his Report (*cf.* Zool. 1892, p. 314), he “perceived, at the first glance, that the Thessalian Field Vole was undoubtedly different from our *A. arvalis*. It was considerably larger, paler in colour, with large shining eyes, and a very short tail. It had a much more vigorous and rat-like appearance than our Field Vole.”

M. Gennadius, at this stage of the proceedings, remarked that the scientific determination of the species was rather difficult, and that the Thessalian Field Vole exhibited several of the characters of *A. arvalis*, but that it might possibly be *A. Savii*.

It was of some interest, therefore, to settle the question, and with this object I wrote to Prof. Loeffler, to whom (with the cooperation of Mr. Robert Service, of Maxwelltown, Dumfries) I had forwarded two consignments of live Scottish Voles, *A. agrestis*, begging him to procure specimens of the Thessalian Vole, and forward them in spirits, for examination, to Mr. Oldfield Thomas, at the Natural History Museum, South Kensington. In due time specimens arrived, and upon careful examination and comparison it was found that they were referable to none of the species above named, but were identical with *A. Güntheri* of Danford and Alston, described by them in 1880 from Asia Minor.*

This unexpected result is of much interest; for it is curious that a European species, so common as to overrun and devastate large tracts of country in Eastern Thessaly, should have

* Proc. Zool. Soc. 1880, p. 50, pl. V.

remained so long unrecognised, or confounded with other European species.

Messrs. Danford and Alston, who, with some misgiving, thought it might possibly be identical with *A. leucura* of Severtzoff,* thus described it:—

“It is not with a light heart that we venture to add to the long list of described species of *Arvicola*; but two specimens of a Vole which Danford found abundantly in the marshes below Marash, present such striking characters that no choice is left to us.

“The following is a detailed description of the animal, which belongs to Blasius’s subgenus *Arvicola* proper, characterised by the first lower molar having *nine* and the second upper molar *four* cemental prisms:—

“Ears moderate, well haired towards their margin, showing distinctly above the fur. Tail hardly longer than the hind foot, and a little more than one-fifth the length of the head and body. Soles densely haired almost to the roots of the toes; fore feet with five tubercles, arranged three and two, besides the very small rudimentary thumb, which has no nail; hind feet with five tubercles closely set, and arranged two, two, and one. Teeth very similar to those of *A. arvalis*, the molar pattern being—

Upper I.—5 prisms 6 angles.	Lower I.—9 prisms 3 angles.
„ II.—4 „ 5 „	„ II.—5 „ 6 „
„ III.—6 „ 7 „	„ III.—3 „ 3 „

But the posterior prisms of the first and second upper molars are dilated behind, and that of the third is produced behind its internal projection. The first three prisms of the first lower molar are imperfectly separated.

“Upper parts yellowish mouse-grey, the tips of the hairs being either light fawn or black; on the flanks this colour passes insensibly into the greyish white of the lower parts, which is slightly washed with yellow on the belly. Feet greyish white. Tail rather thinly clad with short white hairs; these are mixed on its upper surface with dusky hairs, which are most conspicuous near the point. Measurements (in spirits):—

Length of head and body ...	4 in.	4.25 in.
„ tail82	.77
„ ear40	.42
„ hind foot75	.75

* ‘Turkestanski Jevotnie,’ pp. 61, 82; Ann. and Mag. Nat. Hist. (4th ser.), vol. xviii. p. 53.

“ This Vole differs from all others with which we are acquainted in the extreme shortness and peculiar colouring of the tail, and in the density of the hairiness of the soles. It would appear to be most nearly allied to *A. arvalis*, from which it is at once distinguishable by its proportions and by the number of plantar tubercles. In general appearance it bears a strong resemblance to *A. Stoliczkanus*, Blanford, from Yarkand; but that animal has not only a yellowish-white tail, but belongs probably to the subgenus *Paludicola*, Blasius, the first lower molar having only *seven* cemental prisms. It seems not at all improbable, on the other hand, that our animal may be identical with *A. leucura*, Swertzoff; his diagnosis is not impertinent, although he says that the tail is one-fourth the length of the body, and white with a black tip. But in any case his name cannot stand, being preoccupied by the *A. leucurus* of Gerbe, which Blasius and Fatio have united with *A. nivalis* of Martius. We therefore propose to name our species in honour of our friend Dr. Günther.”

Thus far Messrs. Danford and Alston. They say nothing about the haunts, habits, or food of the animal, leaving it to be inferred that these do not materially differ from what has been observed of better-known European species.

Under these circumstances it seems desirable to place on record such observations as I was enabled to make concerning its habits in Thessaly, premising that the season of the year at which I was in the country—namely, during the month of January—was by no means favorable for such observations. Unusually severe weather prevailed, and before the end of the month the great plain of Larissa was covered with snow. Innumerable burrows were to be seen in the fields and along the railway embankment between Velestino and Larissa, but the Voles were all under ground.

It was observable that the Thessalian Voles, except when feeding, dwell less upon the surface of the land than do their Scottish congeners. The “runs” or “galleries” of the latter may be seen in all directions on ground which is infested by them, and an ordinary walking-stick will suffice to dislodge the occupants. The burrows of the former, on the contrary, are more perpendicular than horizontal, and extend very often to such a depth that the extremity of a burrow can only be reached with the aid of a spade. For this reason it is comparatively easy to apply a remedy in Greece which would fail in Scotland, namely, the injection into the burrows of bisulphide of carbon,

causing asphyxiation of the inmates. Moreover, the application of such a remedy would be much easier in the level plains of Thessaly, where the openings of the burrows are everywhere perceptible, than on the rough hill pastures of Scotland, where such openings would have to be carefully looked for, and where in ordinary runs the former would be dissipated long before the animals could be affected.

The burrows of the Thessalian Vole, which are about two inches in diameter, and go to a depth of from eight inches to a foot or more, lead to a gallery which widens out towards a depression in which a nest of dry grass is formed. Several vertical holes sometimes lead to the same gallery, thus facilitating escape in case of need. If water were poured down one hole, the inmates would bolt from another. If the fumes of bisulphide of carbon were to be injected by one hole, those in the immediate neighbourhood would have to be previously stopped. Between the holes well-trodden runs may be perceived, but of nothing like the length of those made by *A. agrestis*.

Another peculiarity remarked was, that the Thessalian Vole is more nocturnal in its habits than our well-known British species. It is rarely seen out in the daytime, and the food which is collected at dusk is dragged into the holes and devoured there at leisure.

Like *A. agrestis*, it multiplies at an extraordinary rate. The period of gestation was not precisely ascertained, but is believed to be about twenty-four days, and the female will produce three or four litters during the spring and early summer, each litter containing from six or eight to a dozen young ones.

As to the nature of the ground which these Voles infest, the great treeless plain of Larissa in the east, like that of Trikala in the west, formerly the bed of an inland sea, is now a great wheat-producing district, the particular wheat grown there being much esteemed for the manufacture of maccaroni, and large quantities of it are exported from Volo to Naples, Genoa, and Marseilles. The soil, though heavy, is in many places loamy, and its fertility is doubtless increased by the inundation, during the winter months, of the River Peneios. The land in this extensive plain is in the hands of comparatively few proprietors, each of whom owns many thousands of acres. The peasants who farm under them take a share of the crops in return for their labour. But

owing to the scanty population it is impossible to find labour sufficient for the entire cultivation of the district, and considerable areas lie fallow for three years, being used in the meantime for pasturing cattle. This, then, is the nature of the ground infested by the Thessalian Field Vole.

The natives, though fully aware of its destructive habits, are very apathetic in regard to remedial measures, and, were it not for the more enlightened views of their employers, they would leave things to take their course, without any interference save sprinkling the ground with holy water from Mecca, in the hope of thus securing the direct intervention of Providence.

The real enemies of these little animals are the Kestrels, Buzzards, Kites, and Harriers, of which we saw great numbers in the plain. To convey some idea of the frequency with which these birds were observed, I give the following list of species observed one day *in the course of an hour*, named in the order in which they were seen, and noted immediately in my pocket-book:—Rooks, Magpies, Crested Larks, Starlings, Calandra Larks, a Great Bustard, two Magpies, a Common Buzzard, two Kites on the wing at close quarters, six Buzzards and a Kite on the wing together; two Kites on a small tree, about fifty yards distant; two Magpies, several Rooks, a solitary Kite, a small flock of Stock Doves passing over, a Kestrel, a flock of Crested Larks; five Snipe, rising from a pool near the railway line; one Kestrel, a flock of Linnets, Wild Ducks on a pool; an Eagle seen at a distance, species uncertain; a Kite on the wing at close quarters, two Magpies, a flock of Larks, two Kestrels, a Kite, another Magpie, another, another, and a flock of Peewits.

In the absence of trees, the Kites and Buzzards were frequently seen perched upon the telegraph-poles, upon which they would often remain unconcerned until we were within twenty yards of them. On one occasion a Rough-legged Buzzard allowed so near an approach that, when at last it took flight, we were near enough to see the feathered legs, which dropped for a few seconds until the bird was fairly on the wing. The Harriers seen were the Marsh Harrier and a blue one—apparently *Circus cyaneus* (Linn.), which is most likely only a winter visitant to Thessaly.

This host of rapacious birds (amongst which, to our surprise, we saw no Short-eared Owls) would make tremendous havoc amongst the Voles; and perhaps the reason for the nocturnal

habits of the latter is that their chief enemies are diurnal birds of prey, and that during the winter months there is comparatively little covert to screen them from observation. They have probably gained wisdom from experience.

In conclusion, and in reply to a question which has been frequently asked, I may add a few words as to the origin of the name *Vole*. This name does not appear to be of any antiquity. Low, in his 'Fauna Orcadensis,' published at Edinburgh in 1813, gives it as in use in Orkney. From this source probably it was adopted by Fleming, in his 'History of British Animals,' 1828, and, following him, by Macgillivray, in his 'British Quadrupeds,' forming vol. vii. of Jardine's "Naturalists' Library." At p. 260 of that volume, under the head of Water Vole, Macgillivray writes:—"The generic name *Vole*, applied to the *Arvicolæ* by Dr. Fleming, seems to be preferable to *Campagnol*, because, although it has no meaning, it gives no erroneous idea of these animals, whereas the latter, besides being descriptively inaccurate, is merely a French word awkwardly introduced, with a pronunciation quite un-English."

As to the meaning of the word, whether it was originally derived from the French or not, I cannot say. The French verb *voler*, has two significations, according to the context in which it is employed, namely, "to steal" and "to fly," or, as we may say, to dart rapidly; either or both of which terms would be applicable to every species of the genus *Arvicola*. If, however, the use of the word has come to us through the Orcadians, its origin is probably to be sought for in Scandinavia.

NOTES AND QUERIES.

The Ornithology of Tennyson.—Under this heading the Rev. J. G. Tuck has an article in the February number of 'The Naturalist,' in which numerous extracts are given from the laureate's poems, presumably intended to show his apt allusions to the feathered race. Picturesque enough are these allusions, no doubt, and poetical, but too often, alas! inaccurate. The expressions in many cases which are intended to be descriptive of notes and flights are neither the best which could be employed, nor are they sometimes sufficiently correct to satisfy the critical ornithologist. In my opinion they tend to prove that the laureate had neither a good eye for

colour nor a good ear for bird-music, while occasionally want of close observation has led to his attributing to certain birds habits which they do not possess. Witness the line in 'The Poet's Song,' where

"The swallow stopt as he hunted the bee,"

and the allusion in 'In Memoriam,' to

"The distant sea where now the sea-mew pipes or dives"

—attributes which are not possessed by any species of sea-gull. On the other hand, it must be allowed that there are several allusions to birds to which no exception can be taken. Such, for example, as the lines in 'The May Queen'—

"The building rook will caw from the windy tall elm tree,
And the tufted plover pipe along the fallow lea."

Here the term "pipe" is strictly appropriate. Again, in 'The Gardener's Daughter,' the Blackbird's song is poetically alluded to the line—

"The mellow ouzel fluted in the elm."

But a few such happy expressions as these do not of themselves entitle the departed laureate to be regarded as more than an ordinary lover of birds, while as an ornithologist, in the proper sense of the term, he shows himself, in my humble judgment, inferior to many English poets who have preceded him.—J. E. HARTING.

MAMMALIA.

Animals poisoned by Yew.—Sometimes, in connection with reported cases of yew poisoning, attempts are made to explain the apparently uncertain action of the poison upon animals, by suggesting that the effect depends upon the sex of the tree upon which the animal has browsed. We have many yews here, and I can remember at least five cases of evident yew poisoning, including sheep (about twenty), horses, and a donkey. At this moment the sex of the tree is easily to be distinguished, as the pollen from the male trees flies in clouds at the slightest touch. I have just been to examine a tree which caused the death of a keeper's pony some years ago, which was tied to the stem for a few minutes, and at whose *post mortem* I was present. The tree—a detached one, and of considerable age—is a male.—W. H. ST. QUINTIN (Scampston Hall, Rillington, York).

The Black Rat in Portugal.—Although nearly extinct in this country, *Mus rattus* is still fairly plentiful elsewhere. In Oporto, for example, I have seen many trapped both in dwelling houses and in wine stores. The Portuguese workmen call them "padres" (or priests). Their fur is much longer and finer than that of the Brown Rat, *Mus decumanus*, which in Portugal is by far the commoner of the two.—C. S. GORDON (Glencairn, The Ridgeway, Willesden).

The Deer Forests Commission.—In the House of Commons on March 16th, Mr. Weir asked the Secretary for Scotland whether it is intended to give crofters, cottars, and others opportunities for submitting statements and giving evidence before the Deer Forests Commission with respect to grievances occasioned by deer forests, grouse preserves, and sheep runs; and whether the Commissioners will make arrangements to give due notice of their intended visit to the districts concerned. Sir G. Trevelyan said: The Commission have instructions to inquire whether any, and, if any, what land in the crofter counties, now occupied for deer forests or for other sporting purposes, or for grazing on a large scale, is capable of being profitably utilised by crofters or other small tenants. Naturally they will receive evidence from all competent sources, whether crofter or landlord, which bears on the subject. The Commissioners will give due notice of their visit to any district.

BIRDS.

Purple Gallinules in Norfolk and Sussex.—With reference to the two occurrences of Purple Gallinule (? species), recorded by Mr. J. Whitaker (Zool. p. 105), it is perhaps well that I should mention that two healthy specimens of the Green-backed Purple Gallinule, *Porphyrio smaragdonotus*, escaped hence, either towards the end of 1890 or early in 1891. I have, within the last few days, heard that a "Purple Waterhen" was observed several times in a garden near Peterborough during the severe weather of 1891-92, and am naturally disposed to think that it was, in all probability, one of my escaped birds. I may add that, in some forty years' experience of collecting living birds, very few of the European Purple Gallinule, *P. cœruleus*, have ever been offered to me for sale, whilst, on the other hand, I have very frequent offers of *P. smaragdonotus*, of which species many are annually shipped for Antwerp from Egypt; and *P. melanotus* of Australia, *P. poliocephalus* and *R. calvus* of Asia, and *P. madagascariensis* of Africa, are not uncommonly to be found in the hands of dealers in live birds in this country and on the Continent.—LILFORD (Lilford Hall, Oundle).

The Purple Gallinules in Norfolk and Sussex.—Without wishing in any way to discredit the likelihood of the Purple Gallinules mentioned as having been killed in Norfolk and Sussex being purely wild birds, it may be interesting to readers of 'The Zoologist' to know that prior to 1881 some fourteen or fifteen examples of both the Blue-backed and Green-backed species went away, at different times, from a wired-in piece of water at our home in Kent. About thirteen acres were wired-in, and they had abundance of covert and a running stream; but they were the very worst birds possible to keep at home, climbing over anything, and always keeping out of sight; they were pinioned, or rather had the wing-feathers cut, and

on moulting would of course have recovered their power of flight. They are, I fancy, very long-lived birds, as all water-fowl are. An old female Pochard I am acquainted with reared a brood regularly for seventeen years.—E. J. B. MEADE-WALDO (Rope Hill, Lymington, Hants).

Ring Ouzel in Norfolk in Winter.—On the 26th of February, Mr. A. J. Napier, of Holkham, informed me that he had seen a Ring Ouzel on the 22nd, frequenting the meadow on the Wells and Holkham Road; that it flew across the road, and alighted on the hedge close to him; and that on the 26th he had seen the bird in the meadow, close to my house. I went out before breakfast on the 27th of February, with my gun, and found the Ring Ouzel in the meadow within a hundred yards of my study window; the bird allowed me to come within twenty yards, so that there was no necessity for shooting it for identification. It was feeding on the grass along with several Starlings. My cows are turned out on this marsh, and no doubt there are plenty of worms to be found under their droppings, which seemed to have an attraction for the bird, as it was hopping about precisely in the manner of a Blackbird. I may say that, brought up in Lancashire, with the moors and Ring Ouzels close by, I could not be mistaken in the species. The occurrence of this bird in England in the winter time, and indeed before April, is very remarkable.—H. W. FEILDEN.

[The occurrence of the Ring Ouzel in England in winter has been several times noticed in the pages of this Journal. See 'Zoologist,' 1879, pp. 174, 203, 266. See also Mansel Pleydell, 'Birds of Dorsetshire' (p. 22), and Bull, 'Birds of Herefordshire' (p. 9). The Rev. C. L. Eagles writes that "the Ring Ouzel lives all the year round on the slopes of the Black Mountains" (Herefordshire), and adds, "I have shot them in winter, and have often found their nests in summer." It was a consideration of the many reported instances of the occurrence of this bird here in winter that induced us, in the 'Handbook of British Birds' (p. 12), to characterise it as a "resident" rather than a "summer visitor," though we added the remark from personal observation that "in the eastern and south-eastern counties of England it is a spring and autumn migrant."—ED.]

Waxwing in Caithness.—We continue to hear at intervals of the appearance of Waxwings in different parts of the country, although not in such numbers as appear here in some winters. In 'John O'Groat's Journal' for Feb. 21st it is reported that Mr. John Malcolm, sheriff's officer at Wick, captured, during the previous week, one of these birds near Rosebank.—ED.

Waxwings in Suffolk.—From fifteen to twenty Waxwings have been shot in Suffolk this winter. In addition to five recorded in 'The Field,' Mr. Travis, of Bury, has had six, of which five were sent in together from

Stowlangtoft, about the 1st of March, and Mr. Bunn, of Lowestoft, had one which was shot on Feb. 25th. Three were recorded in a local paper as shot by a warrener at Hollesley about the end of January, and I have heard of one or two more. Such an immigration has not occurred since the winter of 1866-67.—JULIAN G. TUCK (Tostock Rectory, Bury St. Edmunds).

Waxwings in Essex.—On Feb. 23rd a Waxwing, *Ampelis garrulus*, was shot here, whilst feeding on privet berries. It was either very fearless or stupid, for it allowed several persons to place their hands within a few inches of it. On dissection it proved to be a female bird, and it has five wax-like appendages on each wing. On March 4th, another was killed by a boy with a stone. This was a male, and is the finest bird of four killed in this neighbourhood, the wax-like appendages being larger than any of the others, and numbering six in the right wing, and five in the left. The Waxwings killed on Jan. 30th near here (as already reported, p. 109) were male and female, and had four wax tips in each wing.—F. KERRY (Harwich).

Waxwing and Firecrest in Sussex.—We had sent us for preservation on March 2nd a Waxwing *Ampelis garrulus*, which had been killed at Steyning a few days before; it is a dull-coloured hen bird. On March 18th a female Firecrest, *Regulus ignicapillus*, was brought in for preservation; it had been killed in the furze on the Downs near here.—BRAZENER BROS. (Brighton).

[How about the close time? It is illegal to shoot these birds between March 1st and August 1st.—ED.]

Zonotrichia albicollis, Bonap., in Holderness.—At the commencement of the year Mr. G. W. Jalland, of Holderness House, near Hull, saw, amongst the birds he was in the habit of feeding on his lawn, one with which he was not acquainted, and which he thought might be a wanderer from some distant part of the world. The bird remained about the grounds for six weeks, and its identity not having been solved by Mr. Jalland (though a practical out-door ornithologist), it was shot on Feb. 13th, and sent in the flesh to Mr. Philip Loten, of Easington. I was indebted to Mr. Hewetson, of Leeds, for a full description of the stranger, and an excellent and accurate water-colour sketch of it, on seeing which I suspected it would prove to be an example of the White-throated Bunting, *Zonotrichia albicollis*, and probably an adult male in winter plumage. Subsequently, on Feb. 25th, I had an opportunity of examining it at Mr. Loten's house in Easington, and verifying my supposition. The water-colour drawing was also sent to Prof. Newton for his inspection, who agrees in the determination as *Z. albicollis*. The White-throated Bunting has occurred twice previously in Great Britain,—once on the coast near Aberdeen, in August, 1867, and again at Brighton. The illustration given in Gray's 'Birds of the West of Scotland' gives a very poor idea of the beauty of this bird,

which is a true Bunting, and in no way deserving the trivial name of "Sparrow," which the Americans apply to so many of their finches and buntings. There is not the slightest trace of its ever having been in confinement, either in feather or feet, in this Holderness example, which was undoubtedly a wild bird. The following is its description:—There are two almost black stripes on the crown, separated by a median one of pale buff or dirty white; a broad superciliary stripe from the base of the mandible to the occiput, yellow as far as the middle of the eye, and then pale buff; a broad dark patch on side of head enclosed between darker lines, one of these running through region of eye, the other forming the rictal streak; throat a smoky silky white, and sharply defined against the bluish grey of sides of head and breast—this is margined with a narrow black maxillary line. Edge of wing and axillaries a bright yellow; the whole of the breast and flanks are marked with indistinct and very fine horizontal lines, visible only in certain lights. Back and scapularies rufous-brown, with darker streaks. Wings comparatively short, and extending little beyond root of tail; tail rather long and only slightly rounded, a dark olive-brown; two narrow white bands across wing-coverts. Legs and edges of mandibles flesh-coloured. Length, 7 inches.—JOHN CORDEAUX (Eaton Hall, Retford).

Reported occurrence of the Two-barred Crossbill and Scarlet Grosbeak in Norfolk.—In the 'Zoologist,' 1892 (p. 400), a Two-barred Crossbill is recorded to have been obtained at Yarmouth; but it turns out to be only a very streaky young Common Crossbill, with faint buff tips on its wing-coverts, such as led Brehm to institute his *Crucirostra rubrifasciata*. At p. 401 a Scarlet Grosbeak, *Pyrrhula erythrina* (Pallas) is mentioned with some hesitation, as I had not then seen it. It is a female, and was caught on the denes, between Yarmouth and Caistor, by a local bird-catcher named Jessup. It moulted all its feathers in October; and on November 16th, though still rather ragged, agreed with a skin from Asia, except that it had lost all its dark striations. When first caught, Mr. W. Lowne—to whom the bird belongs—described it to Mr. Southwell as having a streaked breast, and a greenish tinge which it lost at the moult. It has done very well since, and grown tame on soft food and gentles. The eye on Jan. 24th was dark brown, the legs and beak horn-colour, and the general tone of the plumage very like that of a hen House Sparrow.—J. H. GURNEY (Keswick, Norwich).

Rare Birds in Lancashire.—Knowing the county, I have read with great interest your remarks on Mr. Saunders' new edition of Mitchell's 'Birds of Lancashire.' With regard to the Sociable Plover, it seems only just to the author that a brief explanation should be offered as to how he acquiesced in the identification of the bird in question as a Courser. The fact is, Mr. Mitchell had known the bird for years as a reputed Cream-

coloured Courser before he ever set eyes on it. When he did obtain a hasty glance at it, he only saw it by the light of a single candle, and it was partly hidden by other birds preserved in the same case, so that he had no chance of identifying it. Of course, when the bird was taken out of the case it was easily identified. I may add, in reference to the Frigate Petrel, the remark that, although we have no proof that the bird ever saw the shores of Britain, yet there can be no doubt that it must have wandered to our coast, for the reason that, when washed ashore on Walney, it was fresh enough to make a very fair skin. The Wilson's Petrel, obtained at the same time, was much more decomposed when found.—H. A. MACPHERSON (Carlisle).

The Antarctic Sheathbill on the Coast of Ireland.—In the 'Zoologist' for January last (p. 28) Mr. Barrington reported that a bird of this species, *Chionis alba*, was shot by the keeper at Carlingford Lighthouse, Co. Down, on December 2nd, 1892, and was forwarded for his inspection. At a meeting of the Zoological Society, on February 28th last, the bird was exhibited on Mr. Barrington's behalf by the Secretary, and naturally attracted considerable attention from ornithologists present. As *Chionis alba* is known to occur only in the Falkland Islands and South Georgia, the appearance of a living example on the coast of Ireland is only to be explained on the assumption of man's intervention. In all probability the bird was being brought home alive on some homeward-bound vessel from the Falklands, and, having fluttered overboard, succeeded temporarily in making its escape.—ED.

Nesting of the Black Scoter in Sussex.—In the 'Zoologist' for 1892 (pp. 151, 228) we published two letters from Mr. Charles Fowler and Mr. Anderson (the Curator of the Chichester Museum), on the subject of the alleged breeding of *Edemia nigra* in Earnley Marshes, near Chichester. The statement was so extraordinary in view of what is known of the usual nesting-haunts of this species, that we hesitated to accept it without very positive evidence. Mr. Fowler having seen a brood of seven which could just fly, and shot the male bird in August, 1891, forwarded the latter to Mr. Anderson, who vouched for its being correctly named. This bird, which was preserved, was lately forwarded to London for the inspection of ornithologists, and was exhibited by Mr. Howard Saunders at a meeting of the British Ornithologists' Club on the 26th of January last. Evidently the bird in question was a Scoter; but we must confess that we would rather have seen one of the young brood referred to. The question of breeding would then have been more satisfactorily settled. It is so common an occurrence for non-breeding species to be seen swimming about on the same pool with others which are nesting in the neighbourhood, that this missing link in the evidence is the more desirable.—ED.

Petrels seen on the Voyage to Montevideo.—I forward a note of the Petrels seen by me during the voyage out to the River Plate. I have no books to refer to here, and a visit to the Museum at Buenos Ayres (where there is a good and well-arranged collection of birds) did not help me much, so I should be very glad to have the identity of some of the species determined if possible. Sept. 4.—Entered Bay of Biscay at 4 a.m.; a dozen Storm Petrels following us all the forenoon. Sept. 5.—Bowling along merrily before the Portuguese trade-wind; off Cape Finisterre about noon. Among the Petrels was a Fork-tailed one. Some brown Shearwaters, *Puffinus kuhli*. Sept. 6.—38° 48' N., 12° 29' W.; at noon. At least a hundred Storm Petrels followed all day. A small Shearwater, nearly black, top of head quite so, and under parts pure white; very swift flight (? *P. obscurus*). Sept. 7.—At noon; 34° 43' N., 15° W. Some Storm Petrels seen, but fewer than on previous day. Sept. 13.—At noon; 14° 47' N., 26° 14' W. In the morning, when about 80 miles south by a little west of Brava, one of the Cape St. Verde group, saw several times a small black Shearwater with pure white under parts. Sept. 18.—At noon; 5° 33' S., 32° 10' W. An Albatross, *Diomedea melanophrys*, I think, came round the ship in afternoon. When at the quarantine station in Albrahao Bay, Ilha Grande 24th and 25th Sept., I saw two or three Frigate Birds, and there was always a little flock of them over the fish-market during the two days we were at Rio de Janeiro. Sept. 28.—At noon; 23° 37' S., 43° 47' W. Four Wilson's Petrels were following us in the afternoon. Sept. 30.—At noon; 30° 51' S., 49° 5' W. Off the coast of Rio Grande, in the seas of the Petrels. Two Cape Pigeons *Daption capensis*, and a great many dark sooty-brown Shearwaters, considerably larger than Cape Pigeons (? *P. fuliginosus*). There was another species, intermediate in size, brown, with under parts below the chest white, and another rather larger than the sooty-brown ones; wings and small saddle-patch black; rest of plumage white. Several Wilson's Petrels, and one about the size of the last named, but with belly white. What could this have been? Some Albatrosses, *D. melanophrys*? on the wing, and resting on the sea. Altogether a wonderful collection. Oct. 1.—At noon; 34° 12' S., 52° 54' W. Off the coast of the Banda Oriental, and in sight of land in the afternoon. Cape Pigeons were seen in the morning. The big Sooty Petrels (or Shearwaters) followed us all the afternoon, and not far from land, which we were able to approach closely in consequence of the weather being very fine and clear.—O. V. APLIN (Estancia Santa Elena, Monzon, Dept. de Soriano-Uruguay, Feb. 9).

Ruddy Sheldrake in Norfolk.—Col. Feilden informs me that the supposed Ruddy Shelducks at Holkham (Zool. 1892, p. 395) were certainly some other birds. There is no doubt, however, about the Snettisham Ruddy Shelduck, which shows two incipient black tips where the collar

ought to be. It is now in my collection. The threadbare tertials referred to (p. 397) are no indication of confinement, for I have seen them in a wild Ruddy Shelduck in Egypt: but they are scarcely apparent in the Norfolk bird.—J. H. GURNEY (Keswick, Norwich).

Lapwings passing over London.—As one does not have many opportunities of studying wild birds in London, it may be worth recording that at midday, on March 4th, a flock of about a dozen Lapwings passed over Jermyn Street and Piccadilly, flying northward.—CLEMENT REID.

The Gadwall in Scotland.—As the Gadwall, *Anas strepera*, is a somewhat rare bird in the north-east of Scotland, it may perhaps be of interest to record that in December, 1892, I purchased a drake of this species, which had been shot a few days earlier, by a man named James Robertson, in the neighbourhood of the Moray Firth.—H. A. MACPHERSON (Carlisle).

The Nutcracker in Lincolnshire.—Lincolnshire, in common with many other counties, has no record of a Nutcracker, *Nucifraga caryocatactes*, taken within its borders. Assuming that all the *bonâ fide* British specimens of this bird had hitherto been carefully recorded, I wondered how one came to be in a certain public-house in Lincoln. In the course of four or five years I paid several visits to this inn, to see the additions made to his collection by the proprietor. Doubtful whether the Nutcracker was a county specimen, yet wishing to secure it, I offered a case in exchange for it, and the bird became mine. On examination I could find no inscriptions about the case, it having the usual old-fashioned covering of paper, the edges of which, pasted wide over the glass front, acted as moulding, and that detached in places had let in the dust of half a century. So I unglazed the case, and, on removing the bird preparatory to throwing the box away, the inscription, "Male, killed near Sleaford, Linc.," written close inside the case, attracted my attention, and on the corresponding side, too, was marked "March, 1833." So far, so good; but who was the writer of the inscription? Thinking I might find more information outside the case if I removed the colouring of glue and lamp-black, I cleaned the paper, only to find an old report of a parliamentary division. Col. Mason, calling the same day, inspected the case and the data, and, after carefully comparing the handwriting with that of Lucius Gray on some cases in his own collection, he had no doubt that it was identical. And who was Lucius Gray? On the same authority, I learn that he was the taxidermist of Sleaford who preserved most of the so-called "rare birds," at a time when Lincolnshire was described as "The Aviary of England." Many of his birds—from the late Dr. Harvey's collection—were transferred to the old British Museum. It is to be hoped a full list of them will appear when Mr. Cordeaux's 'Birds of Lincolnshire' reaches a second edition.—A. FIELDSEND (Lincoln).

Hybrid Birds at the Crystal Palace Show.—Some correspondence on the subject of the Blackbird and Thrush hybrid, exhibited at the late Crystal Palace Show, has elicited the information that it was taken early in June, 1892, a few miles from Northampton. The nest in which it was found contained three young birds, of which the remaining two died a few days after their capture. A Thrush which flew off the nest is believed to have been the mother of the brood. I was unable to see the bird exhibited as a Chaffinch and Canary mule (p. 104), and would like to know the opinion of anybody who has had the opportunity of examining it, for I am not aware of any authenticated instance of such a hybrid, and some enquiries made into the history of the specimen in question have led to no satisfactory result. — A. HOLTE MACPHERSON (51, Gloucester Place, Hyde Park).

Preservation of New Zealand Native Birds.—It is exceedingly satisfactory to learn that steps have been taken by the authorities of New Zealand to preserve from total extinction the native birds, which are being destroyed in many parts of the colony by the spread of population and by the destructive animals, such as pigs, cats, and other Carnivora introduced by the Europeans. The most obvious method of securing their preservation is the devotion of one of the numerous islands, situated on the coast, to their exclusive use. With a view to carry out this arrangement, Mr. Henry Wright, of Wellington, visited, at the request of the Hon. Mr. Seddon, the island now known as the Little Barrier, or, as it was formerly called, Hauturu Island, situated to the west of New Zealand in 36° south latitude. This island is almost circular, being four and a half miles north to south, and three and a half east to west, rising in the centre to over 2000 ft.; parts of it are extremely rugged, and others comparatively flat and fit for human habitation. The precipitous parts of the country are covered with dense bush and undergrowth, and there are numerous creeks running into the interior, so that a sufficiently diversified country exists for the preservation of the different kinds of birds. At present, the island, which is the property of a New Zealand chief named Tenetahi, is being deprived of its valuable Kauri pines, which are being felled and sold for timber. This, it is hoped, will be put a stop to immediately on the sale of the island to the Government, otherwise all the accessible trees will soon be exhausted. The island is particularly adapted for the preservation of the birds. Mr. Wright says:—“Writing with a thorough knowledge of all the North Island, especially north of Auckland, where I formerly lived, I am able to say there is no other part of it where native birds are to be found in anything like such profusion or variety. Buller's Apteryx or Kiwi is still there, although the young birds are being destroyed by the cats, which are, unfortunately, numerous.” These should be kept down, Mr. Wright thinks, by offering a reward of 9d. or 1s. a tail for their destruction. The wild pigs, which

nearly destroyed the Ohi, or Mutton-bird, have been exterminated, and there are no Weka Rails to destroy the ground-birds' eggs. Mr. Wright makes a statement with regard to the presence of bees which appears difficult to understand. He says:—"In Hauturu there are no bees, and the natives assert that Hauturu is the only island in the Hauraki Gulf with large timber where the native birds still exist in great numbers, and that this is owing to the absence of bees, which do not fly so far across the water, and which they have not permitted to be introduced. They instance the Great Barrier and other islands, equally suitable for birds, whence they have almost disappeared since the bees came." In what manner the bees cause the disappearance of the birds is not evident, but doubtless there is a reason for the statement made by Mr. Wright and the natives. The advantages of Hauturu over Resolution Island, which was proposed for the reception and preservation of the native birds, are stated by Mr. Wright to be its greater distance from the mainland, so that birds of short flight could not migrate; its mountains, which give a considerable range of climate, forming a favourable habitat for birds from the southern parts of the colony; and its size, which would enable a resident to efficiently supervise and protect it from intruders. It has also the recommendation of possessing no boat harbour, the whole island being encircled by dangerous boulder beaches, and only having a safe landing-place on the southern end. He thinks, also, that Hauturu would be admirably adapted for the experimental acclimatisation of profitable trees, such as the orange, tea, coffee, cinchona, &c. At present the island is magnificently timbered, the soil is fertile, and he looks forward to the time when the beauty of its scenery will cause it to be the show place in the North Island, where the last of the native birds and specimens of the noble Kauri pine, native palms, and ferns will flourish in their loveliness, when the primeval forest will have long since been cleared away from the mainland.—*The Field*.

SCIENTIFIC SOCIETIES.

LINNEAN SOCIETY OF LONDON.

March 2, 1893.—Prof. STEWART, President, in the chair.

Messrs. W. Ridewood, L. Ough, K. R. Kirtikar, and Rev. J. Lamont were elected Fellows.

Mr. Miller Christy exhibited some photographs of the American Bison, taken from living wild animals, and gave some account of the present restricted distribution of the species. Mr. A. G. Renshaw and Mr. W. Carruthers detailed what they had been able to learn respecting it while travelling in its former haunts.

Mr. J. M. Macoun gave an account of the flora of the Behring's Sea Islands from personal exploration.

On behalf of Mr. H. N. Ridley, the Secretary read a paper on the flora of the eastern coast of the Malay Archipelago.

March 16.—Prof. STEWART, President, in the chair.

The Rev. J. Bufton, Messrs. R. T. Baker, J. Taylor, and W. H. Wilkinson were elected Fellows; Mr. F. W. Moore was elected an Associate; Mr. W. G. Ridewood was admitted.

A curious Freshwater Alga, growing in a perfectly spherical mass, without any visible point of attachment, and described as an ægagropilous condition of *Cladophora*, was exhibited by Mr. A. W. Bennett, who stated that specimens had been found in English and Welsh lakes, as well as in Sweden, and that the peculiar spherical form of growth was difficult to explain. Mr. G. R. Murray suggested that it might be due to the action of a current which would cause a continuous revolution of the mass.

Mr. R. I. Pocock exhibited a singular nest, so called, of a Myriopod received from Sierra Leone, and formed of a clayey earth which had become hardened by exposure. It was suggested that it was not a nest in the proper sense of the word, formed by the creature itself, but rather a case fashioned by ants for the purpose of entombing their enemy.

Mr. G. F. Scott Elliott gave an interesting account of the botanical results of the Sierra Leone Boundary Commission, and of the collections made by him during five months' travelling. His remarks were criticised by Messrs. J. G. Baker, C. B. Clarke, W. Carruthers, and Dr. Stapf (who was present as a visitor).

Mr. J. H. Vanstone described some points in the anatomy of a mollusc (*Melongenæ*), from recent dissections made by him, and exhibited several preparations in support of his statements. Prof. G. B. Howes bore testimony to the originality and value of the observations, which in some respects were at variance with the views of the most recent writers on the subject. Messrs. G. R. Murray and Horace Monckton offered some remarks on the similarity, in certain respects, of the fauna and flora of the west coast of Africa and the east coast of South America, with reference to the statements made by Mr. Pocock and Mr. Scott Elliott.

ZOOLOGICAL SOCIETY OF LONDON.

February 28, 1893.—Sir W. H. FLOWER, K.C.B., LL.D., F.R.S., President, in the chair.

Mr. A. D. Michael exhibited some specimens of the *Ixodes*, known locally in the West Indies as the "St. Kitts" or "Gold Tick," received from Mr. C. A. Barber of the Agricultural Department, Antigua.

A communication was read from M. A. Milne-Edwards, respecting *Lemur nigerrimus*, Sclater, a species originally described from an example living in the Society's Gardens. It was pointed out that *Prosimia rufipes* of Gray had been based on a female of this species.

Mr. Howard Saunders exhibited and made remarks on a specimen of the American Stint, *Tringa minutilla*, shot at Northam Burrows, North Devon, by Mr. W. Broughton Hawley in August, 1892 (Zool. 1892, p. 411).

Mr. Sclater (on behalf of Mr. R. M. Barrington) exhibited a specimen of the Antarctic Sheathbill, *Chionis alba*, killed at the Carlingford Lighthouse, Co. Down, Ireland, in December last (Zool. 1893, p. 28).

Dr. C. J. Forsyth-Major read a memoir on some of the Miocene Squirrels, and added remarks on the dentition and classification of the Sciuridæ in general. The author proposed a new division of this family into three subfamilies—Sciurinæ, Pteromyinæ, and Nannosciurinæ. The genera *Spermophilus* and *Arctomys* and the allied forms were united to the Sciurinæ. The last part of the paper dealt with the primitive type of the Sciurine molar.

Mr. Henry O. Forbes read a paper entitled "Observations on the Development of the Rostrum in the Cetacean Genus *Mesoplodon*, with remarks on some of the Species." Mr. Forbes showed that in this genus the vomerine canal in the young animal is filled with cartilage, and in the adult with a dense petrosal mesorostral bone. From the examination of thirteen specimens of *Mesoplodon grayi* and four of *M. layardi*, of which he had made a large number of sections in various stages of growth, the author concluded that the mesorostral bone was not, as had been generally believed, an ossification of the cartilage, but an actual growth of the vomer and of the premaxillaries, with perhaps, in some cases, additions from the ossification of the cartilage of the vomerine spout. The cause of the growth in the vomer might be accounted for by the pressure communicated to it by the growth of the premaxillaries, induced perhaps by the movement, which appears to take place, of the maxillaries over the premaxillaries.

March 14.—Sir W. H. FLOWER, K.C.B., LL.D., F.R.S., President, in the chair.

The Secretary read a report on the additions that had been made to the Society's Menagerie during the month of February, 1893, and called attention to two Terrapins procured in Okinawa Shima or Great Loochoo Island by Mr. P. A. Holst, and kindly presented by that gentleman. Mr. Boulenger had determined these Tortoises to be Spengler's Terrapin, *Nicoria spengleri*.

Mr. O. Thomas exhibited and made remarks on a rare Antelope, *Nanotragus livingstonianus*, from Northern Zululand.

Dr. Forsyth-Major exhibited and made remarks on a tooth of *Orycteropus* from the Upper Miocene of Maragha, Persia, which he referred to *O. gaudryi*, of the Upper Miocene of Samos. Drawings of the remains of the latter were exhibited, as well as a photograph of a femur of a Struthious bird from the same deposit in Samos. The habitats of *Struthio* and *Orycteropus* were thus shown to have been essentially identical in past times, as in the present. Therefore the general conclusions to be drawn from their geographical distribution would apply equally to both.

Mr. Oldfield Thomas made some suggestions for the more definite use of the word "type" and its compounds, as denoting specimens of a greater or less degree of authenticity.

Mr. P. L. Sclater pointed out the characters of a new African Monkey of the genus *Cercopithecus*; and took the opportunity of giving a list of the species of this genus known to him, altogether thirty-one in number, together with remarks on their exact localities.

Prof. F. Jeffrey Bell read a paper on *Odontaster* and the allied and synonymous genera of the Asteroidea.

Mr. A. Michael read a paper upon a new species (and genus) of *Acarus* found in Cornwall. The creature in question, which it was proposed to call *Lentungula algivorans*, was found in some numbers on a green alga, *Cladophora fracta*, near the Land's End. It was a minute creature belonging to the family Tyroglyphidæ, the remarkable feature about it being that, whereas the two hind pairs of legs were terminated by a hard and powerful single claw (which claw sprang from the end of the tarsus), the two front pairs had the tarsus itself hardened, and curved strongly downward, forming clinging- and walking-organs; while from the side of the tarsus sprang a long peduncle, flexible in all directions at the will of the creature, and bearing an exceedingly minute claw. This apparatus was not used in climbing, but had become wholly tactile. Such an arrangement was previously unknown in the Acarina.

Prof. Howes described some abnormal vertebræ of certain Ranidæ (*Rana catesbiana*, *R. esculenta*, and *R. macrodon*), in which the so-called "atlas" possessed transverse processes and trans-atlantal nerves. Prof. Howes discussed the bearings of these specimens on the morphology of the parts, deducing the argument that the first vertebra of the Amphibia is probably to be regarded as a representative of at least two vertebræ, of which the formative blastema has become merged in the occiput in the Amniota. The author also described a stage in the development of the urostyle of *Pelobates*, and showed that, in this batrachian, there is a provisional inversion in the order of development of the urostyle and parts of the precoccygeal vertebræ. He also described a reduced hind limb of *Sala-*

mandra maculosa, in which the reduction and fusion of the parts remaining realized the condition normal for the Urodele limb with numerically reduced digits.—P. L. SCLATER, *Secretary*.

ENTOMOLOGICAL SOCIETY OF LONDON.

March 8, 1893.—HENRY JOHN ELWES, Esq., F.L.S., F.Z.S., President, in the chair.

Mr. Frank E. Beddard, M.A., F.R.S., of the Zoological Gardens, Regent's Park, N.W.; Monsieur Edouard Brabant, of Château de Morenchies, Cambrai, France; Mr. Frank Bromilow, of Avalon, St. Maurice, Nice, France; Mr. Henry Powys Greenwood, F.L.S., of Harnham Cliff, near Salisbury; Mr. Frederick Michael Halford, of 6, Pembridge Place, W.; Lieutenant-Colonel Leonard Howard L. Irby, F.L.S., of 41, Cornwall Terrace, Regent's Park, N.W.; Mr. Bertram S. Ogle, of Steeple Acton, Oxfordshire; Herr Wilhelm Paulcke, of 33, Langstrasse, Baden-Baden, Germany; Mr. Louis B. Prout, of 12, Greenwood Road, Dalston, N.E.; and Captain Savile G. Reid, late R.E., of Foyle House, Alton, Hants, were elected Fellows of the Society; and Herr Pastor Wallengren, of Farhult, bei Höganäs, Sweden, and Herr Hofrath Dr. Carl Brunner von-Wattenwyl, of Vienna, were elected Honorary Fellows of the Society to fill the vacancies in the list of Honorary Fellows caused by the deaths of Professor Hermann Carl Conrad Burmeister and Dr. Carl August Dohrn.

Dr. D. Sharp exhibited a species of *Enoplotrupes* from Siam, which was believed to be new, and which he thought Mr. Lewis intended to describe under the name of *E. principalis*. This insect had great power of making a noise, and the female seemed in this respect to surpass the male.

Mr. W. F. H. Blandford said he wished to supplement the remarks which he made at the meeting of the Society on the 8th of February last on the larva of *Rhynchophorus*. He stated that he had since found that only the first seven pairs of abdominal stigmata were rudimentary. The posterior pair were well developed and displaced on to the dorsum of their segment, which was thickly chitinised, and bore a deep depression, on the margins of which the spiracles were situated. He suggested that the absence of lateral spiracles was perhaps correlated with the wetness of the larval burrows, and that it was a displacement of the posterior stigmata, usually supposed to be restricted to aquatic coleopterous larvæ. He added that dissection showed that the posterior pair were the principal agents of respiration. Dr. Sharp and Mr. Champion made some remarks on the subject.

Mr. W. H. B. Fletcher exhibited a long series of bred *Zygana lonicera* and *Z. trifolii*, hybrids of the first generation with the following parentage:—*Z. lonicera*, male—*Z. trifolii*, female; *Z. trifolii*, male—*Z. lonicera*,

female; also hybrids of the second generation between *Z. trifolii*—hybrid, and *Z. loniceræ*—hybrid. The President enquired whether the hybrids were robust and healthy or the reverse. Mr. Fletcher stated that many of the hybrids were larger than the parent species, and that some hybrids between *Z. loniceræ* and *Z. filipendulæ* were the largest he had ever seen. He added that *Zygæna meliloti* would not hybridise with *Z. loniceræ*, *Z. trifolii*, or *Z. filipendulæ*. Mr. Barrett and Mr. Tutt continued the discussion.

Mr. F. W. Frohawk exhibited a bred series of *Vanessa atalanta*, showing the amount of variation in the red band on the fore wings of the female. In seven specimens there was a white spot on this band, and in ten specimens it was absent.

Mr. Elwes exhibited a large number of specimens of *Chrysophanus phlæas* from various places in Europe, Asia, and North America, with the object of showing that the species is scarcely affected by variations of temperature, which was contrary to the opinion expressed by Mr. Merrifield in his recent paper, "On the effects of temperature in the pupal stage on colouring." Mr. McLachlan, Mr. A. J. Chitty, Mr. Bethune-Baker, Mr. Tutt, Mr. Barrett, and Mr. Frohawk took part in the discussion which ensued.

Dr. Sharp read a paper entitled "On Stridulating Ants." He said that examination revealed the existence in ants of the most perfect stridulating or sound-producing organs yet discovered in insects, which are situated on the 2nd and 3rd segments of the abdomen of certain species. He was of opinion that the structures which Sir John Lubbock thought might be stridulating organs in *Lasius flavus* were not really such, but merely a portion of the general sculpture of the surface. Dr. Sharp said that the sounds produced were of the greatest delicacy, and Mr. Goss had been in communication with Mr. W. H. Preece, F.R.S., with the view of ascertaining whether the microphone would assist the human ear in the detection of sounds produced by ants. Mr. Preece had stated that the microphone did not magnify, but merely reproduced sound; and that the only sounds made by ants which he had been able to detect by means of the instrument were due to the mechanical disturbance produced by the motion of the insects over the microphone. A long discussion ensued, in which the President, Canon Fowler, and Messrs. Champion, McLachlan, Goss, Hampson, Barrett, Jacoby, and Burns took part.

Mr. C. J. Gahan read a paper entitled "Notes on the Longicornia of Australia and Tasmania, Part I.; including a list of the species collected by Mr. J. J. Walker, R.N., and descriptions of new forms."—H. Goss and W. W. FOWLER, *Hon. Secretaries*.

THE ZOOLOGIST.

THIRD SERIES.

VOL. XVII.]

MAY, 1893.

[No. 197.

THE BRITISH MARTEN

MARTES SYLVATICA, Nilsson.

BY THE EDITOR.

(Continued from Zool. 1892, p. 138).

IN 'The Zoologist' for 1891 (pp. 401—409) I commenced to give some account of the Marten as one of our rarest indigenous mammals, and in a subsequent article (pp. 450—459) some attempt was made to trace its distribution throughout the English counties. In the volume for 1892 (pp. 131—138) some important additions were made to the records from information supplied by various correspondents, and finally I stopped short of Wales, reserving for some future occasion a transcript of my notes relating to the occurrence of this animal in the principality.

The zoology of the Welsh counties has been unaccountably neglected since the days of Pennant and Bingley, and little has been published on the subject, with the exception of a few local lists of Birds. The Mammals have hardly been noticed, beyond the occasional insertion in this journal, and in 'The Field,' of a few lines reporting the occurrence of some of the rarer animals, such as the Marten and the Polecat. And yet, considering the wildness of the country and the many suitable haunts which must surely exist in some of the wooded and less populated parts of Wales, it is probable that these creatures, if looked for by competent naturalists, would be found to be less rare than is commonly supposed. From time to time I have made notes of

Welsh localities in which the Marten has been met with, and although I do not suppose that they represent anything like a complete indication of its present haunts, an examination of these may pave the way perhaps for further particulars, should these lines meet the eyes of readers who are in a position to give fuller information on the subject.

As regards North Wales, Mr. P. L. Sclater, writing in this journal so far back as 1845, reported (p. 1018) that in the summer of the previous year, while staying at Llanberis he saw a Marten killed by a pack of hounds which were kept for the purpose of killing foxes, wild cats, and other vermin. The Welsh huntsmen who followed this pack on foot, with iron-spiked poles, assured him this animal was then common there, amongst the rocks, and was destructive to lambs. The pack of hounds referred to has long since ceased to exist. About the end of 1879 three were killed in the neighbourhood of Bethgelert, and were preserved for the landlord of 'The Goat' Inn, where they were seen two years afterwards by Mr. Cecil Smith (*Zool.* 1881, p. 419). Since that time others have been reported in the neighbourhood of Bethgelert, and two were trapped in February, 1890, on Lord Penrhyn's moors, by Conway Lake. Donovan, in his 'Natural History of British Quadrupeds,' has referred to the former existence of the Marten in Carnarvonshire and Merionethshire.

About 1867 a Marten was killed by the late Mr. Gwynne Vaughan's hounds near Llanwrtyd, in Brecknock. The skin is still in the possession of Mr. E. C. Phillips, of Brecon, who is aware of the existence of four stuffed specimens obtained in this county since 1857, and who reported (*Zool.* 1887, p. 190) that one of these animals was seen in a wood near Brecon in September, 1886. Writing to us recently on the subject, he says:—"The Marten was formerly common in Brecknockshire, but is now, I fear, almost extinct; although it is possible that a few still survive in some of the large woods and deep dingles. A lady who is well known as a naturalist, and whose father kept hounds in the extreme north of this county many years ago, tells me that they often found and killed a Marten both in Brecknockshire and Radnorshire, and she once remembers seeing two bolted from one hole; they were soon run into and easily killed. The large woods of Llangoed, Breconshire, were formerly a noted place for

them, and about fifteen years ago one was trapped at Henallt Wood, not far distant. It is still preserved in the possession of Sir Joseph Bailey. At the present time there are several stuffed specimens in and near Brecon, but the last living one was seen by my son in September, 1866, in a very large wood near Brecon. As I have the shooting of this wood, I know it has not been trapped for vermin for over twenty years. The old rough Welsh hound will hunt the Marten with great keenness, and about twenty-five years since two hounds belonging to my father-in-law that were 'at walk' at Cefn, Carmarthenshire, midway between Llandovery and Llanwrtyd, hunted a Marten by themselves and killed it. I have the skin now, although it was sadly torn; but the Marten was very scarce even then; still one would think that the large coverts of scrub oak which were formerly so dense in the upper part of Carmarthenshire would be exactly suited to its habits. Of late years these oak woods have given place to larch, but I should think it likely that there still may be some about Ystraddfin and the upper parts of the Towy, where what the keepers are pleased to call 'vermin' are not kept down, and the same remark would apply the wilder portions of the county of Radnor. From the above it will be seen that the Marten is almost, if not quite, extinct in these three counties, and before the end of the century I fear it will have to be classed with the Wild Boar and the Wolf which formerly existed here."

In the neighbouring county of Glamorgan, as we learn from Dillwyn's 'Materials for a Fauna of Swansea,' the Marten was formerly to be met with near Swansea in Clive Wood and Neath Valley, and it is recorded, in 'The Zoologist' for 1849 (p. 2440), that in April of that year one was killed in the neighbourhood of Newbridge.

(To be continued.)

BIRD MIGRATION AT HELIGOLAND.

By H. GATKE.

THE February number of the 'Zoologist' (pp. 71—73) contains an article by Mr. Seebohm, in which, though it is directed against Mr. Cordeaux, I am accused of inaccuracy and ignorance respecting the birds that have passed through my hands, either alive or recently killed on Heligoland, during the last fifty-five years. In the first instance, Mr. Seebohm maintains that "very many" of the species of a list of accidental visitors furnished by me to Mr. Cordeaux are in reality "regular autumn visitors on migration to Heligoland," and, in substantiation of his assertion, Mr. Seebohm names, out of the "very many," but four instances, *viz.*, the Shore Lark, *Alauda alpestris*; Richard's Pipit, *Anthus Richardi*; the Rustic Bunting and Little Bunting, *Emberiza rustica* and *E. pusilla*. I doubt whether Mr. Seebohm has been very lucky in his choice, for if he had taken the trouble to acquaint himself with what I have very explicitly said ('Vögelwarte Helgoland,' p. 375) respecting the migratory movements of *Alauda alpestris*, he would have found that not only am I very far from considering this bird an accidental visitor to Western Europe, but, on the contrary, I endeavoured to prove that its winter-quarters must of necessity be looked for in certain localities of France and Spain.

Widely different stands the case with *Anthus Richardi*, a native of the far east of Asia, from Lake Baikal to the Sea of Ochotzk; its regular line of autumnal migration runs south, and it consequently is a common winter resident in South China and the eastern parts of India, Bengal for instance, being in Calcutta a plentiful market bird during the winter months. Such individuals, therefore, as under exceptional and undoubtedly meteorological influences adopt at irregular periods—though in rare instances in comparatively considerable numbers—a western instead of their normal southern autumnal migration flight, can reasonably be pronounced only accidental visitors to Europe,—the more so since even the cases of appearance in greater numbers of this Pipit have occurred mostly at intervals of from six to ten years, *viz.*, in 1839, '48, '49, '59, '68, '69, '70, and '76. On account of prevailing westerly winds, *Anthus Richardi* has,

during the last fifteen years, been obtained here but once or twice about every third year.

More surprising still is Mr. Seebohm's attempt to rank the Rustic Bunting among the regular autumnal visitors of Heligoland. In my collection this species is represented by eight specimens, obtained here between 1840 and 1883, one more having been caught during a temporary absence of mine, but spoiled for preservation; these nine birds include all the instances of its capture on Heligoland, for since 1883 no Rustic Bunting has been shot here. And on so scant a number of cases, scattered over more than half a century, Mr. Seebohm rests his assertion that this Bunting is a regular, and not an accidental, visitor to Heligoland. It may be added that, respecting Great Britain, only three instances of the capture of this species are on record.

The Little Bunting, like the foregoing species, breeds throughout the whole north of Asia, and its winter-quarters are likewise in China and India, its normal autumnal migration flight being south; western deviations, therefore, can also be attributed only to meteorological influences, and happen for this cause very irregularly. Altogether I have obtained this Bunting on Heligoland from twenty-five to thirty times; but this comparatively considerable number is not spread evenly over the fifty-five years of my ornithological pursuits. From 1845 to 1852 this bird was shot here once or twice every autumn; then followed a great scarcity till 1879, during the latter part of September and greater part of October of which year this Bunting—together with the Rustic Bunting—was observed frequently and shot repeatedly; since the latter date—that is to say during the last thirteen years—not a single specimen has been obtained; all these years westerly winds prevailed during the autumnal migration periods. In Great Britain this Bunting has been taken but once.

Considering the above facts, it would appear rather a rash undertaking to pronounce *Emberiza pusilla* a regular, instead of an accidental, visitor to Heligoland.

Mr. Seebohm further states that I did not, and in fact could not, know and distinguish a young bird, in its first spring dress, from adults of the same species; the absurdity of such a statement is almost too great to call for any remark.

Appearing, however, in a scientific periodical as an argument in support of his assertion that most of the great number of rare accidental visitors to Heligoland were not old birds, but birds in their first spring,—that is to say, not quite a year old,—I feel called upon, in order to show the fallacy of this latter hypothesis, to give further on a list of such specimens of the visitors in question as are beyond doubt two years old and more, and not young “blundering” individuals in their first year. There is surely far less “blundering” in the migratory movements of birds than is to be found in some of the laborious compilations about migration.

Respecting Mr. Seebohm’s opinion that “of course no evidence is to be found in the (my) book” that I could distinguish a young from an old bird, I have to add that I certainly did refrain from swilling my work with descriptions of the common order to be found in scores of books, but that where I deemed it advisable—as, for instance, with *Anthus Richardi*—I have given a very complete description of all stages of plumage from two months to two years of age and upwards. In support of his view, Mr. Seebohm particularly quotes *Turdus varius*: had he proceeded, however, in a less superficial manner, he would have found in my book (pp. 243 and 244) a description of this Thrush, giving, as a peculiar character of the same, the “purely white” and deep black streak which extends over the under side of the extended wing of the bird. Mr. Seebohm laying down this mark as a particular sign of age in the species, he must, by his own evidence, allow the nine examples of *T. varius* to pass as adult birds.

Here may follow the list of such rare exceptional visitors as are represented by specimens of two years of age and more:—*Falco rufipes*, 2 males, 1 female; *Muscicapa albicollis*, 1 male; *Pastor roseus*, 9 males, 7 females; *Turdus saxatilis*, 2 males, 1 female; *Sylvia mesoleuca*, 1 male; *S. Bonelli*, 1 male; *S. viridanus*, 1 male, 1 female; *S. virens*, 1 male; *Accentor alpinus*, 3 males; *Saxicola aurita*, 2 males; *S. deserti*, 2 males; *S. morio*, 1 male, 1 female; *Anthus ludovicianus*, 1 female; *Alauda leucoptra*, 1 male, 1 female; *A. tatarica*, 1 male, 1 female; *Emberiza aureola*, 1 female; *E. cæsia*, 8 males, 1 female; *E. pityornis*, 1 male; *E. rustica*, 6 males, 1 female; *E. pyrrhuloides*, 1 male; *E. melanocephala*, 6 males, 4 females; *Hirundo rufula*, 1 male; *Cypselus melba*, 1 male; *Charadrius fulvus*, 2 males; *C. caspius*,

1 male; *Anas perspicilata*, 1 male; *Larus affinis*, 1 male; *L. Rossi*, 1 male. To these may be added, *Sylvia superciliosa*, 11; *Anthus Richardi*, 20 at least; *Alauda brachydactyla*, the same number; and *Emberiza pusilla*, 10. Together 140 birds, every one of which I had fresh in my hands, and ascertained their sex by dissection.

Young birds of the age of one year or less, of the south-eastern species enumerated in the foregoing list, have been obtained here in very rare instances; they are:—*Falco rufipes*, once; *Pastor roseus*, 6 young grey birds; *Turdus saxatilis*, 1 in first autumn; *Sylvia viridanus*, 1 in first summer; *Saxicola deserti*, 1 in first autumn; *Emberiza melanocephala*, 1 in first summer, 1 in second summer; *Charadrius caspius*, 1 in first autumn; *Alauda brachydactyla*, 1 in first autumn.

With the exception of a few American birds, the accidental visitors are divided, according to season, strictly into two groups, viz., those which come from the far east and east-north-east, and those whose home lies in a south-eastern direction—Greece, Asia Minor, Palestine, Turkestan. The former appear almost without exception in autumn, the latter quite as exceptionally from the end of May to the end of July; the former, like all autumnal migrants, consisting of about two-thirds of young birds, from two to three months old, whilst the latter are represented almost exclusively by old birds, and principally by the finest old males. Both movements are favoured by light south-east winds and fine warm weather. What, however, causes a small number of individuals of these eastern species to give way to meteorological influences, and adopt a western flight instead of their normal southern autumnal migration, would be very difficult to say. It would seem easier to solve the question respecting those visitors from the south-east which appear during the breeding-time, and nearly all of them being fine adult birds; the approximate conclusion is, that they are individuals which have lost their mate at a more or less early period of their nesting, and, the impulse of propagation being not yet extinct, they resume their inherent line of spring migration, being in their case towards the north-west, and so pass on to Germany and England. This view of the case is supported by the fact that the greater number of these birds are very fine old males; the females on the nest being more subject to destruction by their manifold enemies. Further support of this

view is afforded by the appearance in Great Britain of numerous birds of Western Africa and Spain; for instance, *Accentor alpinus*, *Merops apiaster*, *Cypselus melba*, *Cursorius europæus*, and others, most of which have been obtained from twenty to thirty times, and thus under the same circumstances must have resumed their spring migration, which in their case, however, lies in a northern direction.

The foregoing statements will, I trust, prove that the much-debated exceptional visitors of Central and Western Europe consist not of individuals which ramble at random about the world, but that, since their appearance from homes so widely separated takes place at as widely separated fixed seasons, and to a great extent depends on the age of the wanderers, these exceptional movements of each of these two groups must of necessity also be governed by fixed recurring causes. Ornithologists ought to give up the worn-out myth of inexperienced young birds dependent on the teaching and guidance of their experienced parents; for the moment the young are tolerably well able to take care of themselves, parents and young separate, and become perfect strangers to each other. The first perfect plumage of the latter being completed in a few weeks, they start of their own accord, and entirely by themselves, on their first migratory excursion, whilst many of the parent birds devote themselves to a second brood, or, at all events, have to go through the tedious process of change by moult of their entire plumage, being thus detained for one to two months from following their offspring into winter-quarters. This holds good for nearly all regular passengers in Heligoland, the sole exception being the Cuckoo, which, leaving the care of hatching its egg and rearing its young to kind-hearted foster-parents, is free to go south whenever it pleases. The most striking instance of young birds preceding their parents in autumn by a month or two is furnished by Starlings, *Sturnus vulgaris*; young grey birds appearing here by hundreds and thousands at the latter part of June, without in any case being accompanied by a single old one, the autumnal movement of the latter commencing about the end of September, lasting through October, and occasionally till late in November. Quite as regularly, but in a reversed succession, does the return movement in spring take place, when the finest old males are invariably the first to appear; for instance, orange-billed, glossy

black, Blackbirds, *Turdus merula*, shortly followed by old females, and later by young of the previous spring, the rear being brought up by the halt and lame,—birds of all ages, in defective plumage, having lost part of their tail or some of the primary wing-feathers, some toes, or even a whole foot. This order by age and sex is maintained with unflinching precision by all species during their respective periods of autumn and spring migration. Heligoland being in fact an unequalled “Vögelwarte”—bird observatory—the seasonal movements of birds pass before the observer in their original purity; no birds, either old or young, reside here to raise any doubt as to whether the individuals seen by observers are natives of the place or passengers.

Finally, I may remark that the ‘Vögelwarte Helgoland’ is not, as would appear from Mr. Seebohm’s repeated allusions to the same in the ‘Zoologist’ and the ‘Ibis,’ a mere enumeration of the birds observed and obtained on the island, the section of the book relating to these birds being of merely secondary import; the principal part of the work consisting of observations on migration, which are divided into nine chapters, *viz.*:—Migration in general; Direction; Height and speed of migratory flight; Succession as to age and sex; Meteorological influences on migration; Exceptional occurrences; What induces birds to start on migration; and What guides them during the same.

ON A NEWLY-OBSERVED HABIT IN THE BLACKCAP WARBLER.

By JOHN LOWE, M.D., F.L.S.

A SINGULAR habit of the Blackcap, *Sylvia atricapilla*, which I have noticed during the present spring may be worth recording, if, as I suppose, no previous note has been published on the subject.

In the garden of the Martinnez Hotel, Orotava, Teneriffe, are some large bushes of *Hibiscus Africanus*, which are covered with their brilliant scarlet blossoms. Being only ten or twelve feet distant from the balcony, one can see everything that passes in them with great facility. They are the favourite resort of the Blackcap Warblers, which come there to feed, taking but little

notice of anyone who may be on the balcony. My attention was first drawn to them by observing the male bird fly, every now and then, to one of the flowers, creep along its stem, and peck at the calyx. Examining the flower to see the meaning of this proceeding, I found that, in almost every instance, the two upper segments had a small piece bitten out of them, while in some cases the calyx segment was torn right across.

On examining a large series of flowers, by removing the calyx it appeared that under each of the two upper segments there is a single drop of slightly sweet and sticky watery fluid—how secreted I could not determine, as there is no semblance of a nectary. The fluid is found under none of the other segments, nor is it present in flowers which grow low down and in the shade, and only rarely on the pink blossoms of a variety which grows near. The calyx of these flowers is not bitten; but an occasional scarlet flower, which occurs on the pink variety, has always holes in the calyx.

The object of making the holes is, as it would seem, not to get at the liquid for the purpose of drinking it, but in order to attract insects to serve as prey. Several times I have observed the bird seize an insect in the act of visiting the pierced calyx, which after being bitten shows a moist spot. When this dries up I have observed the bird tear the calyx segment across, when a little fresh moisture exudes; but this is never done until the two small holes have dried up. After prolonged watching I could not find that more than two kinds of insects visited the calyx, and these—one a small bee and the other a small wasp—flew directly to the calyx without visiting the flower. No flies of any kind came, and no other insect except an ant, which evidently came to visit a few Aphides which lived on the calyx.

I could not discover that any insect visited the flower except a large humble bee, and this always went straight to the flower itself, and never attempted the calyx. It was able, apparently, to reach the fluid betwixt the petals which have an opening at their base, through which the proboscis can readily be passed into the calyx.

All the points which I have described were observed repeatedly, not only with the naked eye, but also with a binocular glass, and I do not think it possible that I can be mistaken in any one of them.

The salient features in the observation are, I think, remarkable:—(1.) The fact of the bird choosing the only spot where the liquid occurs, in order to make the opening in the calyx which is to serve as the bait for the insect. (2.) The visit of the insects paid directly to the calyx, and not to the flower. (3.) The fact that the humble bee, which so commonly makes this kind of aperture in the fuchsia and other flowers, should in this instance make no approach to the calyx. (4.) That the punctures are, so far as I have observed, made only by the male bird, never by the rufous-headed female.

The honey bee, which visits in large numbers a tree close by, never approaches the *Hibiscus*.

March 18.—I found, on further investigation, that the flowers of the pink variety of *Hibiscus Africanus* do not secrete any nectar, and are but little visited by the humble bee. The cause appears to be that the corolla overlaps at the base much more closely than in the scarlet flowers, so that no opening is left for the proboscis; in the scarlet there is an opening. Can it be that the nectar under the calyx is due to the irritation caused by the vent of the humble bee? I think it clearly is so. The scarlet flowers which occur on the trees with the pink variety always have nectar, and the calyx torn—the pink flowers never.

Monte, Las Palmas, Grand Canary, March 22.—I find that *Hibiscus Africanus* has been treated here in the same way by the "Capirote" (*Sylvia atricapilla*). But I also find that *Abutilon frondosus*, another plant of the *Hibiscus* family, has undergone a similar mutilation of the calyx. In this instance, however, there are notable differences. The base of the calyx has nectar all round the receptacle, and not, as in *Hibiscus*, on two spots midway on the inner surface of the two upper segments,—hence the openings are made in each segment,—and they are made not by the Blackcap Warbler, but by a black-headed Tit with bluish-green body. The object seems to be—but I cannot be quite sure of this—to enable it to get at the ants, which come to the nectar in large numbers. In the case of the *Hibiscus* they do not enter the calyx, and only a few visit the flowers apparently to milk the Aphides, and these are not found on the *Abutilon*. There are not many winged insects visiting these flowers, except a large species of wasp.

The Titmice visit the flowers in succession, tearing out large

bits of the calyx and letting them fall, searching busily inside, and apparently eating the ants; possibly also making a fresh bait in the juice which exudes. It is quite curious to see them so busily employed on these pendulous flowers, which are also visited by humble bees, but in a manner different from that which takes place in the *Hibiscus*, where they enter the flower by crawling along the lower petals, and can only probe the spaces betwixt the upper ones. In *Abutilon* they climb up the stamens, and—the spaces at the base of the petals being much wider than in *Hibiscus*—they are able to reach the nectary through them all.

These facts are, I think, interesting, but they do not seem quite so remarkable as those which relate to the Blackcap. I shall be glad to learn whether they have any novelty.

PROPOSED AMENDMENT OF THE WILD BIRDS PROTECTION ACT, 1880.

A BILL to amend the Wild Birds Protection Act, 1880, has been prepared and brought in by Sir Herbert Maxwell, Sir John Lubbock, Mr. Baird, Mr. J. A. Pease, Mr. Loder, and Mr. Bagot; and on the 13th April was ordered by the House of Commons to be printed. Its provisions are as follow:—

WHEREAS it is expedient to provide for the better protection of certain species of wild birds in the United Kingdom:

Be it therefore enacted by the Queen's most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows:

I. This Act may for all purposes be cited as the Wild Birds Protection Act, 1893, and shall be construed as one with the Wild Birds Protection Act, 1880 (hereinafter referred to as "the principal Act"), except as hereinafter provided.

II.—(1.) Any county council as to any county in Great Britain and the justices in quarter sessions as to any county in Ireland (which bodies are hereinafter respectively referred to as "the authority"), may, after the *passing of this Act*, prohibit the taking or destroying the eggs of any species of wild bird in any place or places within the county, and any person who shall take or

destroy, or incite any other person to take or destroy, the eggs of any species included in such order in any place specified therein, shall, on conviction before any two justices of the peace in England, Wales, or Ireland, or before the sheriff in Scotland, forfeit and pay for every egg so taken or destroyed a sum not exceeding *one pound*.

(2.) Any order made under this section shall be published by the authority not less than *fourteen days* before the commencement of the period when the prohibition shall commence, by advertisement in the principal newspaper or newspapers published within the county, or, if none are published therein, then in the principal newspaper circulating within the county, and by such further means as the authority may determine.

(3.) A copy of any such order purporting to be certified by the clerk of the authority shall be evidence of the order having been made.

(4.) All expenses incurred by the authority in the making or publishing of the order shall be defrayed out of any fund or rate out of which the general expenses of such authority are payable by law.

III. The Wild Birds Protection Act, 1881, is hereby repealed.

IV. The schedule to the principal Act shall be read and construed as if the word "lark" had been inserted therein.

The proposal to empower county councils to prohibit the taking of eggs is one on which some difference of opinion may be expected to arise. There is a good deal of sentiment about the time-honoured practice of "birds-nesting," a practice in which boys in all ages have been permitted, and indeed encouraged, to indulge, provided they do not trespass nor commit wilful damage,—restrictions, however, which are too often but lightly regarded. To abolish this ancient practice entirely would be not only unwise, but unnecessary. There are many birds whose eggs may be taken without prejudice to anyone, and without fear of exterminating the species to which they belong, so long as the parent birds are not killed or taken at the same time. But there are others, like the Lapwing or Peewit and Black-headed Gull, whose eggs are a source of profit to those upon whose lands they are found breeding, and which are taken wholesale by un-

authorised persons who entirely ignore the rights of *meum* and *tuum*, and disregard the law of trespass. The eggs, also, of Woodcock, Snipe, and wild ducks of various kinds, are valued for the sake of the broods they may produce, to the advantage of wild-fowl shooters, and to the augmentation of good and marketable food.

It is not unreasonable that some check should be imposed upon the indiscriminate collection of such eggs as these; and provided that those who may have to apply to the County Council for an order, should the Bill pass, will exercise discretion and moderation in their demands, the result to all concerned should be distinctly beneficial.

A CATALOGUE OF LOCAL LISTS OF BRITISH MAMMALS, REPTILES, & FISHES, ARRANGED UNDER COUNTIES.

BY MILLER CHRISTY, F.L.S.

IN July, 1890, I contributed to the 'Zoologist' (3rd series, vol. xiv, pp. 247—267) "A Catalogue of Local Lists of British Birds," which (to judge from the amount of correspondence I have received upon the subject) appears to have been deemed of interest and value by other ornithologists. I have, therefore, been led to compile similar catalogues relating to Mammals, Reptiles, and Fishes, although the compilation of such catalogues involves an amount of personal trouble and research of which those who have not undertaken such work can have no conception. The present catalogues complete the Vertebrate Fauna of Britain. For convenience, the Reptiles and Amphibians have been thrown into one list.

The system on which I have worked is the same as that adopted in the bird-catalogue, but requires a few words of explanation. The titles of the works catalogued are given chronologically under counties, the latter being arranged under England and Wales, Scotland, and Ireland. The details are entered in the following order:—Surname of author, Christian name, as much of the title as is necessary for identification, the name of the periodical or volume in which the article or list in question appeared (if not separately published), place of publi-

cation, size, and date, followed in many cases by a few brief remarks on the work catalogued. The date of publication has, contrary to custom, been placed after the size, for convenience of reference. In the case of magazine articles, or of lists which form portions only of larger works, the title of the magazine or work of which they form part, has been given *in italics*, for the sake of distinction.

With scarcely an exception, I have excluded all volumes or articles which do not aim at giving a *tolerably complete list* of the species inhabiting the districts of which they treat. Mere notes or observations on a few species only are, therefore, entirely omitted, even although they may be purely local. For instance, the Rev. H. A. Macpherson's interesting pamphlet on 'The Visitation of Pallas's Sand Grouse to Scotland in 1888' (London, 8vo, 1889) and many similar essays are excluded. To have included notices or articles on the distribution of single species over certain areas, or their occurrence in certain spots, would have enormously swelled (and totally changed the constitution of) my catalogues. This would, in fact, have made them nothing less than a complete index to the literature of the British vertebrate animals—a work for which my leisure is altogether inadequate.

In every case, the titles of the volumes or articles entered in my bibliography have been taken by me direct from the works themselves, and have not been obtained second-hand, except in those few instances in which I clearly state that I myself have "not seen" the works in question.

I have been taken to task by more than one good naturalist for having arranged the items in my catalogues according to political, rather than natural, divisions. I maintain, however, that the course I have adopted is the right one. I regard these catalogues merely as a means towards an end—namely, the ultimate mapping-out of the exact distribution of each British species. This should, of course, be done with regard to the *natural* divisions; but so much of the work which goes to make such a mapping-out possible, has been done with regard only to *political* boundaries (such as those of counties) that there was little or no alternative but to compile the present catalogues in the form I have adopted.

Surprise will, I think, be felt at the extraordinarily-large number of "Local Lists" which it has been found possible to in-

clude within the somewhat narrow lines of the present catalogues. The number certainly shows in a very effective manner the great activity of British naturalists, and indicates that, when the actual mapping-out of the exact geographical distribution of each species comes to be undertaken, it will be possible to accomplish it with a very near approach indeed to precision.

The catalogues will, of course, indicate at a glance those counties whose fauna has received most attention; but it may be as well to point out those which have received least, and which, therefore chiefly require that some local observer should undertake the work of setting forth the main peculiarities of their fauna. This will accordingly be done in some remarks which will appear at the end of each list.

I shall be particularly obliged to those readers of the 'Zoologist' who, observing omissions in my catalogues, will be good enough to call my attention to them, as it is intended shortly to re-publish the present catalogues in separate form, with additions, as was done in the case of the previous Catalogue of Local Lists of Birds. There are, doubtless, many more local lists, not herein catalogued, to be found in old county histories, the Proceedings and Transactions of local Natural History Societies, and in local topographies and guide-books. It is impossible to become acquainted with many of these, except through the kindness of correspondents.

MAMMALS.

ENGLAND AND WALES.

BEDFORDSHIRE.

DAVIS, FREDERICK. — [Mammals of the Neighbourhood of Luton.] In his *History of Luton*, pp. 192-93. Luton, dy. 8vo, 1855. (Enumerates 25 species, without comment.)

MILLER, S. H., and S. B. J. SKERTCHLY. — [The Mammals of the Fenland]. In their *Fenland, Past and Present*, pp. 358-362. Wisbeach and London, roy. 8vo, 1878. (An admirable list; enumerates 37 species.)

CAMBRIDGESHIRE.

MILLER, S. H., and S. B. J. SKERTCHLY. — [The Mammals of the Fenland.] In their *Fenland, Past and Present*, pp. 358-362. Wisbeach and London, roy. 8vo, 1878. (An admirable list; enumerates 37 species.)

CHESHIRE.

LEIGH, CHAS.—[The Mammals of Cheshire.] In his *Natural History of Lancashire, Cheshire, and the Peak in Derbyshire*, book ii, pp. 1-7. Oxford, fcap. fo., 1700. (Only a few species are mentioned, and those chiefly domestic.)

CORNWALL.

BORLASE, REV. WM., F.R.S.—[The Mammals of Cornwall.] In his *Natural History of Cornwall*, pp. 286-291. Oxford, fcap. fo., 1758. (The species enumerated are chiefly domestic.)

[Anon.] [The Mammals of Cornwall.] *Monthly Magazine*, vol. xxvi, pp. 443 & 528. London, dy. 8vo, 1808. (Enumerates 25 wild species.)

POLWHELE, REV. R.—[The Mammals of Cornwall.] In his *History of Cornwall*, vol. iv, p. 126-127. London, dy. 4to, 1816. (Very imperfect.)

COUCH, JONATHAN.—[The Mammals of Cornwall.] In his *Cornish Fauna; being a Compendium of the Natural History of the County*, pp. 6-10. Truro, dy. 8vo, 1838. (A good list; includes domestic species; for 2nd ed., see under J. Brooking Rowe, Truro, dy. 8vo, 1877.)

COCKS, W. P.—[The Mammals of the Falmouth District.] *Naturalist* (Morris's), vol. i, pp. 37-39. London, roy. 8vo, 1851. (Enumerates 29 wild terrestrial species.)

BULLMORE, W. R., M.D.—[The Mammals of Cornwall.] In his *Cornish Fauna; a Short Account of all the Animals found in the County, &c.*, pp. 1-7. Truro, dy. 8vo, 1867. (A good list; enumerates 41 wild species.)

BATE, C. SPENCE, and others.—[The Marine Mammals of the South Coast of Devon and Cornwall.] In *Brit. Assoc. Report for 1869*, pp. 84-85. London, dy. 8vo, 1870.

ROWE, J. BROOKING.—[The Mammals of Cornwall.] *The Journal of the Royal Institution of Cornwall*, no. xix, pp. 396-403. Truro, dy. 8vo, 1877. (Jonathan Couch's *Cornish Fauna* [q. v.], revised and corrected by J. Brooking Rowe; an excellent list; enumerates 44 species; also reprinted separately.)

CUMBERLAND.

HEYSHAM, DR. JOHN.—[Mammals of Cumberland.] In Wm. Hutchinson's *History of the County of Cumberland*, vol. i, pp. 1-4. Carlisle and London, 2 vols., dy. 4to, 1794. (An admirable list for the period; enumerates 29 wild species.)

MACPHERSON, REV. H. A.—[The Mammals of Cumberland.] In his *Vertebrate Fauna of Lakeland*, pp. 1-86. Edinburgh, dy. 8vo, 1892. (An admirable list; enumerates 42 living species.)

DERBYSHIRE.

LEIGH, CHAS.—[The Mammals of Derbyshire.] In his *Natural Zoologist*.—MAY, 1893.

History of Lancashire, Cheshire, and the Peak in Derbyshire, book ii, pp. 1-7. Oxford, fcap. fo., 1700. (Only a few species are mentioned, and those chiefly domestic.)

GLOVER, STEPHEN.—[The Mammals of Derbyshire.]; a Sketch of the Zoology of Derbyshire. In this Author's *History and Gazetteer of the County of Derby, &c.*, vol. i, pp. 112-121. Derby, 2 vols., dy. 4to, 1831. (A fair list; enumerates 34 species, of which 7 are domesticated and several extinct.)

DEVONSHIRE.

POLWHELE, Rev. R.—[The Mammals of Devonshire.] In his *History of Devonshire*, vol. i, pp. 114, and 125-135. Exeter and London, dy. fol., 1797. (An excellent list for the period; includes domestic animals.)

[Anon.]—[The Mammals of Devonshire.] *Monthly Magazine*, vol. xxvi, pp. 433 & 528. London, dy. 8vo, 1808. (Enumerates 25 wild species.)

TURTON, W., and J. F. KINGSTON.—[The Mammals of the Teignmouth District.] In their *Natural History of the District [around Teignmouth]*, 5 pp. Teignmouth, fcap., n. d. [1830].

BELLAMY, J. C.—Catalogue of the Mammals . . . inhabiting South Devon and the adjacent Sea. In his *Natural History of South Devon*, pp. 192-197. Plymouth & London, post 8vo, 1839. A very extensive list enumerating 43 species, including several which are doubtful.)

ROWE, J. BROOKING.—The Mammals of Devon. In his *Catalogue of the Mammals, Birds, Reptiles, and Amphibians of Devon*, pp. 2-11. London and Plymouth, dy. 8vo, 1863. (An excellent list; enumerates 41 species)

BATE, C. SPENCE, and others.—[The Marine Mammals of the South Coast of Devon and Cornwall.] In *Brit. Association Report for 1869*, pp. 84-85. London, dy. 8vo, 1870.

JORDAN, W. R. HALL.—[The Mammals of Teignmouth and Vicinity.] *Transactions of the Devonshire Association*, vol. vi, pp. 708-709. Plymouth, dy. 8vo, 1874. (A partial list only.)

D'URBAN, W. S. M.—[The Mammals of South Devon.] In *The Handbook of Exeter*, pp. xxv-xxvii. Exeter, fcap. 12mo, n. d. [? 1875]. (A good list, though brief; enumerates about 40 species.)

CHANTER, J. R.—[The Mammals of Lundy Island.] In his *Lundy Island: a Monograph*, pp. 131-132. London, 8vo, 1877. Reprinted from *Trans. Devonsh. Assoc. Sci., Lit. and Art.*, 1871).

PARFITT, E.—[The Mammals of Devonshire.] *Transactions of the Devonshire Association*, vol. ix, pp. 306-330. Plymouth, dy. 8vo, 1877. (An excellent list; enumerates 45 species.)

DORSETSHIRE.

DALE, J. C.—Catalogue of the Mammalia . . . found in Dorsetshire. *The Naturalist* (Neville Wood's), vol. ii, pp. 171-172. London, roy. 8vo, 1837. (Enumerates 26 species.)

DANIEL, J. E.—[The Mammals of Wool, near Wareham.] *Naturalist* (Morris's), vol. v, pp. 175-178. London, roy. 8vo, 1855. (Not important.)

DALE, C. W.—The Mammals of Glanville's Wootton.] In his *History of Glanville's Wootton*, pp. 27-29. London, cr. 8vo, 1878. (Enumerates 27 species.)

DURHAM.

MENNEL, HY. T., & V. R. PERKINS.—A Catalogue of the Mammalia of Northumberland and Durham. *Trans. Tyneside Nat. Field Club*, vol. vi, pp. 111-176. Newcastle-on-Tyne, dy. 8vo, 1864. (An admirable list; enumerates 50 wild species.)

LEBOUR, Prof. J. A.—[The Mammals of Durham.] In his *Outlines of the Geology of Northumberland and Durham*, pp. 157-158. Newcastle-on-Tyne, cr. 8vo, 1886. (A brief notice; not a list.)

LOFTHOUSE, R.—[The Mammals of the Tees Valley.] *Naturalist*, vol. xii, pp. 4-9. London, dy. 8vo, 1887.

ESSEX.

LAVER, HENRY.—The Mammalia of Essex. In *Trans. Essex Field Club*, vol. ii, pp. 157-180. Buckhurst Hill, dy. 8vo, 1882. (An excellent list; enumerates 40 species.)

HARTING, J. E.—[The Mammals of Epping Forest.] In E. N. Buxton's *Epping Forest*, pp. 71-82. London, med. 8vo, 1884. (Enumerates 18 species; also with additions in the 2nd ed., pp. 68-79, London, fcap. 8vo, 1885; and in the 3rd ed., 1890.)

[HARTING, J. E.]—[The Mammals of Epping Forest.] In Percy Lindley's *Walks in Epping Forest*, pp. 129-132. London, oblong cr. 8vo, n. d. [1887].

LAVER, Dr. HY.—The Mammals of Essex. To form part of his *Vertebrate Fauna of Essex*. (In the press.)

GLAMORGANSHIRE.

DILLWYN, L. W.—Notes relating to the Mammalia found in this neighbourhood [Swansea]. In his *Materials for a Fauna and Flora of Swansea and Neighbourhood*, pp. 1-2. Swansea, roy. 8vo, 1848. (Enumerates 12 wild species.)

PROGER, T. W.—List of Mammalia . . . occurring in the neighbourhood of Cardiff. *Handbook for Cardiff and District, prepared for the use of the British Association*, pp. 150-152. Cardiff, 8vo, 1891.

GLOUCESTERSHIRE.

[KNAP, J. L.]—*The Journal of a Naturalist*. London, cr. 8vo, 1829. (Contains observations on the Mammals; chiefly on pp. 132-150).

NICHOLLS, H. G.—[*The Mammals of the Forest of Dean*.] In his *Forest of Dean*, pp. 199-204. London, cr. 8vo, 1858. (Alludes to few species, except the deer.)

WITCHELL, CHAS. A.—[*The Mammals of Gloucestershire*.] In *Witchell and Strugnell's Fauna and Flora of Gloucestershire*, pp. 1-42. Stroud, roy. 8vo, 1892. (An excellent list; enumerates 37 species.)

HAMPSHIRE. (*See also* WIGHT, ISLE OF.)

BELL, THOMAS.—[*Mammals of Selborne*.] In his edition of *White's Natural History and Antiquities of Selborne*, vol. ii, pp. 262-263. London, roy. 8vo, 1877. (Enumerates 28 species.)

HAVILAND, W. A.—[*The Mammals of the Winchester District*.] *The Fifth Report of the Winchester College Natural History Society*, p. 115. Winchester, dy. 8vo, 1881. (Enumerates 19 species.)

HEREFORDSHIRE.

LINGWOOD, R. M.—[*Mammals of a part of Herefordshire*.] *Annals of Nat. Hist.*, vol. v, pp. 184-185. London, dy. 8vo, 1840. (Enumerates 24 species.)

HUNTINGDONSHIRE.

MILLER, S. H., & S. B. J. SKERTCHLY.—[*The Mammals of the Fenland*.] In their *Fenland, Past and Present*, pp. 358-362. Wisbeach and London, roy. 8vo, 1878. (An admirable list; enumerates 37 species.)

KENT.

BOYS, WM.—[*The Mammals of Sandwich and its Neighbourhood*.] In his *Collections for an History of Sandwich*, pp. 847-849. Canterbury, dy. 4to, 1792. (A fairly good list, though it lacks comments and includes the domestic animals.)

LANCASHIRE.

LEIGH, CHAS.—[*The Mammals of Lancashire*.] In his *Natural History of Lancashire, Cheshire, and the Peak in Derbyshire*, book ii, pp. 1-7. Oxford, fcap. fo., 1700. (Only a few species are mentioned, and those chiefly domestic.)

BYERLEY, ISAAC.—[*The Mammals of Liverpool*.] In his *Fauna of Liverpool*, pp. 5-9. London and Liverpool, dy. 8vo, 1856. (Enumerates 42 species, including those domesticated.)

McNICHOLL, D. H.—*The Mammalia of Southport*. In his *Handbook for Southport*, 2nd ed., pp. 76-78. London, cr. 8vo, 1861. (A good list; enumerates 22 species; 1st ed. not seen.)

[Anon.]—List of Mammalia found round Bury.] *Report of the Bury Nat. Hist. Soc.*, 1868-71, p. 51. Bury, cr. 8vo, 1872.

MACPHERSON, Rev. H. A.—[The Mammals of Lancashire north of the Sands.] In his *Vertebrate Fauna of Lakeland*, pp. 1-86. Edinburgh, dy. 8vo, 1892. (A most admirable list.)

LEICESTERSHIRE.

MOTT, F. T.—The Mammals of Leicestershire. *Midland Naturalist*, vol. vii, pp. 301-303. London & Birmingham, dy. 8vo, 1884. (Enumerates 25 species.)

BROWNE, MONTAGU.—[The Mammals of Leicestershire.] *Zoologist*, 3rd series, vol. ix, pp. 161-169, 214-220, & 248-253. London, dy. 8vo, 1885. (A good list; includes fossil species.)

———[The Mammals of Leicestershire.] In his *Vertebrate Animals of Leicestershire and Rutland*, pp. 1-38. Birmingham and Leicester, cr. 4to, 1889. (A considerable list, but it includes fossil and domestic species.)

LINCOLNSHIRE.

MILLER, S. J., & S. B. J. SKERTCHLY.—[The Mammals of the Fenland.] In their *Fenland, Past and Present*, pp. 358-362. Wisbeach & London, roy. 8vo, 1878. (An admirable list; enumerates 37 species.)

MAN, ISLE OF.

KERMODE, P. M. C.—Some Remarks on the Mammals of the Isle of Mann. In *The Manx Note Book*, vol. i, pp. 119-129. Douglas, dy. 8vo, 1885.

———Mammals [of the Isle of Man.] *Zoologist*, 3rd series, vol. xvii, pp. 61-64. London, dy. 8vo, 1893. (A good list; enumerates 13 species.)

NORFOLK.

BROWNE, Sir THOS.—[The Mammals of Norfolk.] *Monthly Magazine*, vol. xx, p. 127. London, dy. 8vo, 1805. (A very imperfect list, written about the year 1670; enumerates 6 species only.)

PAGET, C. J. & J.—[The Mammals of the Yarmouth District.] In their *Sketch of the Natural History of Yarmouth and its Neighbourhood*, pp. 1-2. London, dy. 8vo, 1834. (Enumerates 30 species.)

LUBBOCK, Rev. RICHARD.—[The Mammals of Norfolk.] In his *Observations on the Fauna of Norfolk, and more particularly on the District of the Broads*, pp. 1-11. Norwich & London, dy. 8vo, 1845. (A valuable list; also in the 2nd ed. edited by Messrs. Southwell, Stevenson, & Newton, pp. 1-18, Norwich & London, dy. 8vo, 1879.)

LOWNE, B. T.—[The Mammals of the Yarmouth District.] In his *Popular Natural History of Great Yarmouth and its Neigh-*

bourhood, pp. 39-42 & 61-62. Yarmouth, London, & Norwich, cr. 8vo, 1863. (Enumerates 26 species; practically a second edition of the Pagets' work.)

GURNEY, J. H.—Stray Notes on Norfolk and Suffolk Mammalia. *Trans. Norf. & Norw. Nat. Soc.*, vol. i, pp. 22-26. Norwich, dy. 8vo, 1870. (An admittedly incomplete list; enumerates 19 species only.)

HUNT, A. LEIGH. — [The Mammals of Thetford.] In his *Capital of the Ancient Kingdom of East Anglia*, pp. 236-238. London, dy. 8vo, 1870. (An unimportant list; see *Trans. Norf. & Norw. Nat. Soc.*, vol. i, pp. 83-87.)

SOUTHWELL, THOS. — [The Mammals of Norfolk.] *Trans. Norf. & Norw. Nat. Soc.*, vol. i, part 2, pp. 71-81. Norwich, dy. 8vo, 1874. (A good list; enumerates 37 species; extensive additions vol. iii, pp. 657-676B, 1884, brings up the total to 41 species.)

MILLER, S. H., & S. B. J. SKERTCHLY.—[The Mammals of the Fenland.] In their *Fenland, Past and Present*, pp. 358-362. Wisbeach & London, roy. 8vo, 1878. (An admirable list; enumerates 37 species.)

NORGATE, F. — Notes on Norfolk Mammalia. *Trans. Norf. & Norw. Nat. Soc.*, vol. ii., pp. 458-470. Norwich, dy. 8vo, 1878. (Though not a list, this paper contains interesting observations on no less than 25 species.)

JOHNSON (RANDALL). — An Approximate List of the Extinct Mammalia of Norfolk. *Trans. Norf. & Norw. Nat. Soc.*, vol. ii, pp. 279-292. Norwich, 8vo, 1879.

NORGATE, F.—Mammalia [of Norfolk.] In R. H. Mason's *History of Norfolk*, App. pp. xii-xiii. London, roy. 4to, 1884. (A good list; enumerates 37 species.)

SOUTHWELL, THOS.—Mammalia of Norfolk. *Trans. Norf. & Norw. Nat. Soc.*, vol. iii, pp. 657-676B. Norwich, 8vo, 1884. (Enumerates 41 species; an amplification of the author's previous list.)

NORTHAMPTONSHIRE.

MORTON, Rev. JOHN.—[The Mammals of Northamptonshire.] In his *Natural History of Northamptonshire*, pp. 442-455. London, fcap. fo., 1712. (Relates chiefly to domestic species.)

NORTHUMBERLAND.

WALLIS, JOHN.—[The Mammals of Northumberland.] In his *Natural History and Antiquities of Northumberland*, vol. i, pp. 405-414. London, 2 vols., dy. 4to, 1769. (A very good list for the period.)

[MACKENZIE, E.]—[The Mammals of Northumberland.] In his *View of the County of Northumberland*, vol. i, pp. 138-147

& 160. Newcastle-on-Tyne, 2 vols., dy. 8vo, 1811. (Relates mainly to domestic animals; also reprinted almost verbatim in the 2nd ed., vol. i, pp. 108-114, Newcastle-on-Tyne, 2 vols., dy. 4to, 1825.)

SELBY, P. J.—[The Mammals of Twizel.] In *Mag. of Zool. & Bot.*, vol. i, pp. 421-424. Edinb., Lond. & Dublin, dy. 8vo, 1837. (Enumerates 19 species.)

MENNEL, HY. T., & V. R. PERKINS.—A Catalogue of the Mammalia of Northumberland and Durham. *Trans. Tyneside Nat. Field Club*, vol. vi, pp. 111-176. Newcastle-on-Tyne, dy. 8vo, 1864. (An admirable list; enumerates 50 wild species.)

EMBLETON, ROBERT C.—[The Mammals of the Alnwick District.] In Geo. Tate's *History of . . . Alnwick*, vol. ii, p. 440. Alnwick, dy. 8vo, 1868-69. (A list merely, without comments; enumerates 30 species.)

LEBOUR, Prof. G. A.—[The Mammals of Northumberland.] In his *Outlines of the Geology of Northumberland and Durham*, pp. 157-158. Newcastle-on-Tyne, cr. 8vo, 1886. (A brief notice; not a list.)

OXFORDSHIRE.

PLOT, R.—[The Mammals of Oxfordshire.] In his *Natural History of Oxfordshire*, pp. 187-191. London, fcap. fo., 1677. (A meagre list, relating almost exclusively to domestic animals; reprinted almost verbatim in the 2nd ed., pp. 191-195. London, fcap. fo., 1705.)

BEESELY, ALFRED.—[The Mammals of the Banbury District.] In his *History of Banbury*, pp. 600-601. London, dy. 8vo, n. d. [1841.] (A fair list, but almost without remarks; enumerates 26 species.)

RUTLAND.

BROWNE, MONTAGU.—[The Mammals of Leicestershire and Rutland.] In his *Vertebrate Animals of Leicestershire and Rutland*, pp. 1-38. Birmingham & Leicester, cr. 4to, 1889. (A considerable list, but includes fossil and domestic species.)

SHROPSHIRE.

EYTON, T. C.—[The Mammals] of Shropshire and North Wales. In *Mag. of Zool. & Bot.*, vol. ii, pp. 537-542. Edinb., Lond., & Dublin, dy. 8vo, 1838. (A very good list; enumerates 26 species; additions, vol. iv, p. 396.)

SOMERSETSHIRE.

BAKER, W.—Mammalia [of Somersetshire.] *Proceedings of the Somersetshire Archaeological and Natural History Society for 1849-50*, pt. 2, pp. 140-141. Taunton & London, dy. 8vo, 1851. (Enumerates 43 species, but without comments.)

FARBROTHER, JOHN E.—[The Mammals of Shepton Mallet.]

In his *Shepton Mallet*, pp. 171-174. Shepton Mallet & London, cr. 8vo, 1859. (Enumerates 20 species.)

COMPTON, THEODORE.—[The Mammals of the Winscombe District.] In his *Winscombe Sketches*, 2nd ed., pp. 91-97. London, cr. 8vo, n. d. [? 1882.] (Also in his *Mendip Valley*, pp. 113-125, an enlarged edition of the same work, London & Swindon, dy. 8vo, 1892.)

STAFFORDSHIRE.

PLOT, ROBERT.—[The Mammals of Staffordshire.] In his *Natural History of Staffordshire*, pp. 252-267. Oxford, fcap. fo., 1686.

PITT, WM.—[Mammals of Staffordshire.] In his *Topographical History of Staffordshire* [Appendix], pp. 141-145. Newcastle-under-Lyme, dy. 8vo, 1817. (Not important.)

GARNER, ROBERT.—[The Mammals of Staffordshire.] In his *Natural History of the County of Stafford*, pp. 242-254. London, dy. 8vo, 1844. (A good list; enumerates 28 wild species; see also Supplement issued in 1860, pp. 33-34.)

BROWN, EDWIN.—[Mammals of the Burton-on-Trent District.] In Sir Oswald Mosley's *Natural History of Tutbury*, pp. 86-91. London, roy. 8vo, 1863. (A very good list; enumerates 29 wild, living species.)

MOSLEY, Sir OSWALD, Bart.—Mammals [of the Tutbury District.] In his *Natural History of Tutbury*, pp. 16-32. London, roy. 8vo, 1863. (A good and full list.)

SUFFOLK.

GURNEY, J. H.—Stray Notes on Norfolk and Suffolk Mammalia. *Trans. Norf. & Norw. Nat. Soc.*, vol. i, pp. 22-26. Norwich, dy. 8vo, 1870. (Refers to 18 species.)

HELE, N. F.—[Mammals of the District around Aldeburgh.] In his *Notes or Jottings about Aldeburgh*, pp. 180-182. London, cr. 8vo, 1870. (Mentions a few species only.)

ZINCKE, Rev. F. BARHAM.—[Notes on the Mammals of Wherstead.] In his *Materials for the History of Wherstead*. Ipswich, 8vo, 1887. (Reprinted from the *Suffolk Chronicle*, May 31st, 1884.)

SUSSEX.

CHAMBERS, GEO. F.—[The Mammals of the Eastbourne District.] In his *Handbook for Visitors to Eastbourne*, pp. 83-84. London & Eastbourne, cr. 8vo, 1868. (Enumerates 20 species.)

EASTBOURNE NATURAL HISTORY SOCIETY, MEMBERS OF.—[The Mammals of the Eastbourne District.] In their *Lists of the Local Fauna and Flora*, p. 2. [Eastbourne], cr. 8vo, 1873. (A list merely, without comments; enumerates 21 species; an earlier edition, dated 1871, not seen.)

WEAVER, J.—[Mammals of Harting.] In the Rev. H. D. Gordon's *History of Harting*, pp. 233-252. London, cr. 8vo, 1877. (A good and full list.)

WALES, NORTH.

EYTON, T. C.—[The Mammals] of Shropshire and North Wales. In *Mag. of Zool. & Bot.*, vol. ii, pp. 537-542. Edinb., Lond., & Dub., dy. 8vo, 1838. (A very good list; enumerates 26 species; additions, vol. iv, p. 396.)

WALES, SOUTH.

DILLWYN, L. W.—[Mammals of Swansea, &c.] In his *Materials for a Fauna and Flora of Swansea and the Neighbourhood*, pp. 1-2. Swansea, 8vo, 1848. (Enumerates 14 species.)

WARWICKSHIRE.

WAIT, Rev. W. O.—[List of the Mammals of the Rugby District.] In his *Rugby Past and Present*. Rugby, 1893. (Not seen.)

WESTMORELAND.

GOUGH, THOMAS.—Mammals [of the Kendal District.] In Cornelius Nicholson's *Annals of Kendal*, 2nd ed., pp. 306-307. London & Kendal, dy. 8vo, 1861. (Enumerates 21 species; the 1st ed. did not contain the list.)

MACPHERSON, Rev. H. A.—[The Mammals of Westmoreland.] In his *Vertebrate Fauna of Lakeland*, pp. 1-86. Edinburgh dy. 8vo, 1892. (A most admirable list; enumerates 42 living species.)

WIGHT, ISLE OF.

WARNER, Rev. RICHARD.—[The Mammals of the Isle of Wight.] In his *History of the Isle of Wight*, pp. 204-206. Southampton & London, dy. 8vo, 1795. (Enumerates a few species only.)

BURY, Rev. C. A.—Notes on the Mammalia of the Isle of Wight. *Zoologist*, vol. ii, pp. 776-790. London, dy. 8vo, 1844. (A good list.)

MARTIN (G. A.)—[Mammals of the Undercliff.] In his *Undercliff of the Isle of Wight*, pp. 162-176. London, post 8vo, 1849. (A fair list.)

MORE, A. G.—[The Mammals of the Isle of Wight.] In the Rev. C. Venables' *Guide to the Isle of Wight*, pp. 408-412. London, fcap. 8vo, 1860. (A good list.)

WILTSHIRE.

MATON, GEO., M.D.—Mammalia [of the Salisbury District.] In his *Natural History of a Part of the County of Wilts*, p. 70. London, dy. 8vo, 1843. (Very incomplete; enumerates 6 species only.)

AUBBEY, JOHN.—[The Mammals of Wiltshire.] In his *Natural History of Wiltshire*; written between 1656 and 1691; edited by John Britton, pp. 58-61. London, dy. 4to, 1847. (Interesting, but does not mention many species.)

WORCESTERSHIRE.

HASTINGS, CHAS., M.D.—[The Mammals of Worcestershire.] In his *Illustrations of the Natural History of Worcestershire*, pp. 56-62. London & Worcester, dy. 8vo, 1834.

YORKSHIRE.

GRAVES, REV. JOHN.—[The Mammals of Cleveland.] In his *History of Cleveland*, App. xi, [3 pp.]. Carlisle, dy. 4to, 1808. (Enumerates 25 wild species, but without comments.)

DENNY, HENRY.—Sketch of the [Mammals] of Leeds and its Vicinity. *Annals of Nat. Hist.*, vol. v, pp. 382-386. London, dy. 8vo. (A good list.)

HOBKIRK, CHAS. P.—[The Mammals of the Huddersfield District.] In his *Huddersfield; its History and Natural History*. London & Huddersfield, cr. 8vo, 1859. (A fair list; enumerates 22 species; also in the 2nd edition, pp. 213-214, Huddersfield and London, cr. 8vo, 1868.)

ROBERTS (GEO.)—Topography and Natural History of Lofthouse and its Neighbourhood [&c.], 2 vols. London & Leeds, cr. 8vo, 1882-85. (Contains many notices of mammals.)

CLARKE, W. EAGLE & W. DENISON ROEBUCK.—[The Mammals of Washburndale.] *Naturalist*, vol. ix, pp. 11-12. Huddersfield, dy. 8vo, 1884. (Enumerates 10 species.)

ROEBUCK, WM. D.—[The Mammals of Yorkshire.] In Clarke & Roebuck's *Handbook of the Vertebrate Fauna of Yorkshire*, pp. vii-viii, xxx-xxxii, & 1-14. London & Leeds, dy. 8vo, 1881. (An excellent list; enumerates 46 species; additions in the *Naturalist*, vol. ix, 1884, pp. 147-150, raise the total to 45 species.)

CLARKE, W. EAGLE, W. D. ROEBUCK, & WM. STOREY.—[The Mammals of Upper Nidderdale.] *The Naturalist*, vol. xi, pp. 193-197. Huddersfield, dy. 8vo, 1886. (Enumerates 30 species.)

LOFTHOUSE, R.—[The Mammals of the Tees Valley.] *The Naturalist*, vol. xii, pp. 4-9. London, dy. 8vo, 1887.

WOODD, C. H. B.—[The Mammals of Langstrothdale.] *The Naturalist*, vol. xvi, pp. 135-136. London, dy. 8vo, 1891.

WAITE, EDGAR R.—[The Mammals of the Western Ainsty.] *The Naturalist*, vol. xvi, pp. 82-86. London, dy. 8vo, 1891. (A good list; enumerates 26 species.)

(To be continued.)

NOTES AND QUERIES.

MAMMALIA.

Aristotle on Plagues of Field Mice. — Possibly some readers of 'The Zoologist' may not have compared the accounts recently published of plagues of Field Voles in Scotland and Thessaly, with Aristotle's description of similar occurrences more than two thousand years ago. The comparison is most interesting, and the conclusion which Aristotle came to was very much the same as that expressed by the Committee appointed by the Board of Agriculture whose Report was published in the last number of 'The Zoologist' (p. 121). The following extract is taken from the translation of Aristotle's 'Natural History of Animals,' Bohn's edition (p. 178):—"There is a doubt respecting the reproduction and destruction of the Mice which live on the ground; for such an inexpressible number of Field Mice have sometimes made their appearance that very little food remained. Their power of destruction, also, is so great that some small farmers, having on one day observed that their corn was ready for harvest, when they went the following day to cut their corn, found it all eaten. The manner of their disappearance also is unaccountable; for in a few days they all vanish, although beforehand they could not be exterminated by smoking and digging them out, nor by hunting them and turning swine among them to root up their runs. Foxes also hunt them out, and wild Weasels are very ready to destroy them; but they cannot prevail over their numbers and the rapidity of their increase; nor indeed can anything prevail over them but rain, and when this comes they disappear very soon."

—A. HOLTE MACPHERSON.

[This passage will be found in the 'Historia Animalium,' lib. vi., cap. 37, and it would be easy to supply references to other classical authors who have made allusion to the damage caused by Field Mice (Arouraioi). For example, Diodorus, lib. iii., cap. 30; Ælian, 'De Natura Animalium,' lib. ix., cap. 41, and lib. xvii., cap. 41; Rutilius, Itin. v. 285; Æschylus at Sisyphus; 'Geoponicorum sive de re rustica,' lib. xiii., cap. 5; not forgetting Theophrastus, and the more familiar Pliny. Ælian relates how a visitation and plague of Field Mice drove certain peoples in Italy out from their native land, and made them wanderers on the face of the earth; destroying not only the leaves of the plants as a drought would, or extreme frost, or other inclemency of the season, but eating up the very roots. Rutilius also relates (*l. c.*) how a similar experience befel the people of Cosa. Then there is the account given by Herodotus (Euterpe. ii. 141) of the defeat of the army of Sennacherib, in consequence of the destruction by Field Mice, during the night, of their quivers, arrows, and bowstrings, which were rendered useless by gnawing. In fact, the classics are full of

wonderful stories of Mice; and if anyone had leisure to collect and compare them, they would afford material for an extremely interesting article. We commend this to the consideration of the Rev. W. Houghton, whose interesting little book on the 'Natural History of the Ancients' (post 8vo, London, Cassell & Co., 1879) lies before us as we write, and who, with the knowledge of a naturalist, combines a familiar acquaintance with Greek and Latin authors. Apropos of this subject, we may direct attention to a brief article entitled "Field Voles and the Apolline Worship," by the Rev. W. Warde Fowler, of Oxford, published in the 'Classical Review' for November, 1892, and to a longer one with the title "Apollo the Mouse God," in the 'Stonyhurst Magazine' (December, 1892), which emanates from the well-known college in Lancashire, the article in question being attributed by report to the pen of a young but promising student of zoology, Mr. C. D. Plater. That there is a good deal of misconception and some exaggeration in the accounts of Voles given by the ancients is of course admitted, but that a good deal of ignorance still prevails on the subject is evident from what is stated in a long article headed "The Plague of Voles," in a London newspaper, published as recently as the 15th of April last. The writer of this article informs his readers that Voles, "though small, are really more of a cross between Squirrels and Beavers" (!); that "their molars, if they have flat tops, have transverse sides"; that "they run up trees, squirrel-like, and nibble at the tender bark up high"; that "they are partially dormant in winter," and "lay up stores which contain bits of carrots and potatoes, and among these often cherry-stones." This is a curious jumble of the habits of the Squirrel, Dormouse, Long-tailed Field Mouse, and Short-tailed Vole, which, it need hardly be said, is not to be found in the lately-issued Report of the Committee on Field Voles which the writer pretends to review.—ED.]

CETACEA.

Hump-backed Whale on the Coast of Sligo.—On March 21st a specimen of the Hump-backed Whale, *Megaptera longimana* (Rudolphi), so rare in the British Seas, came ashore on the Enniscrone sands, Co. Sligo. The animal had probably been feeding too close to shore in the shallow water, and on grounding was overpowered by the surf and cast upon the sands. It lived for some hours, and at times lashed the water furiously with its tail and spouted from its blow-holes, occasionally opening and shutting its mouth. The body was very clumsy, and so thick as to look quite out of proportion to its length, being probably between twenty and thirty feet in circumference; black in colour all over the upper parts (the under parts, being buried in the sand, could not be seen), except the long narrow flippers, which were white, with a few black spots on upper side, and a few patches of white on the margin and under side of flukes, and

also on the longitudinal folds or pleats of skin on sides of throat, giving the latter a marbled appearance. To the edges and under sides of both flippers and flukes were attached a large number of the parasitic *Coronula diadernia*, like a gigantic *Balanus*, and so firmly fastened or embedded in the skin that both that and the blubber had to be cut before the shells could be detached. The long, narrow, straight flippers, with scarcely a perceptible curve, were notched or scalloped along the edges, as was also the posterior margin of the flukes. The head was broad and flat; the upper jaw very flat and depressed between the lower jaw-bones, which rose above it at each side where the mouth was close. On the upper jaw were three rows of tubercles; one of seven in the centre running from the end of the snout to the blow-holes, 6 to $7\frac{1}{2}$ inches asunder in the row, and varying from a half to an inch in height; and one of eleven on each side just above the lips, almost reaching to the eyes, but in two places for about six or eight inches the side rows of tubercles were double. The baleen, as well as I could judge without measuring, appeared to be from twelve to fifteen inches in length, black in colour, and fringed at the ends with coarse greyish brown hairs. The small dorsal fin, placed very far back, was between six and seven inches in height. The dimensions, carefully taken with a string, were as follows:—Length from fork of tail to dorsal fin, 10 ft. 3 in.; dorsal fin to end of snout, 18 ft. 10 in.; total length, following curve of back, 29 ft. 1 in.; from end of snout to blow-holes, 4 ft. 7 in.; breadth of flukes, 9 ft.; flippers from humerus, 9 ft. 2 in. This whale has never before been recorded as a visitor to the coast of Ireland, and is evidently very rare in the British Seas. Prof. Flower, in his recent book on Mammals, mentions one taken at Newcastle in September, 1829, another in the estuary of the Dee in 1863, and a third at the mouth of the Tay in 1883-4; thus only three examples have been previously recorded to have visited the British Islands. It may not be out of place here to express my obligations to Mr. Alfred Heneage Cocks for his able paper on the "Finwhale Fishery on the coast of Finmark" (Zool. 1884), and to acknowledge that it was owing to my having read his very interesting notes that I was enabled to recognise this whale when it came ashore.—ROBERT WARREN (Moyview, Ballina).

BIRDS.

Blackbird marked like Ring Ouzel.—About a year ago I reported to you a variety of Blackbird I used to see every day here during the nesting and breeding time—a well-plumaged male with a grey-drab crescent-shaped patch at the upper part of the breast near the throat. This bird is still here; I see it frequently on the lawn. It is now of a still more jet-black plumage, and the grey patch is very well defined and distinct. This is evidently not a case of a pied Blackbird, such as we often get in very severe winters (cases of this kind, I believe, never continue

the pied plumage after the summer moult), but a bird in which the abnormal marking is perpetuated, for I feel convinced it is the same bird that I saw a year ago. I imagine the reason I have not observed it in the meantime is because it is now, in the pairing and nesting time, that these birds are so constantly on the lawn, whereas through the autumn and early winter they are seldom there.—O. P. CAMBRIDGE (Bloxworth Rectory, Wareham).

Hybrid Birds at the Crystal Palace Show.—Under this heading (p. 154) Mr. A. Holte Macpherson, referring to the supposed Chaffinch-Canary mule at the recent Palace Show, says:—"I am not aware of any authenticated instance of such a hybrid." This is, I believe, true; but I cannot help thinking that the fact is largely due to misconceptions on the part of mule-breeders, many of whom are not scientific men, and firmly believe in two widely-disseminated fallacies:—(1) that the Chaffinch does not, like other finches, feed either its hen or its young from the crop; (2) that the Chaffinch pairs on the wing. I have heard both these reasons assigned for not attempting hybridization, not once, but repeatedly. As regards the first—that the Chaffinch does not feed from the crop—I may quote from notes which I took eight years ago:—"In the spring of 1886 I noticed that one of my hen Canaries had taken a fancy to a cock Chaffinch in my aviary, but for some time he seemed not to reciprocate the feeling; eventually, however, he began to feed her from the crop; therefore I placed the pair together in a large cage, where they paired; the Canary built and commenced to lay eggs marked and coloured like those of a Chaffinch. As the cock bird devoured the first egg, I took him out of the cage, and three eggs of the Chaffinch type were then laid and sat upon steadily for three weeks, when I took them out and found that they were all clear." Now this bird only paired once with the Canary, and apparently with little effect, for although the eggs had the opaque colouring and heavy marking of Chaffinch eggs they were not fertile. The feeding of the cock bird was, however, continued on the nest at intervals throughout the day until the evening of the day on which the first egg was destroyed, when (as soon as it was dark) I quietly removed the Chaffinch. I tried the same Chaffinch with a Canary last year, but he is now too old for breeding purposes. As regards the second fallacy, I have seen Chaffinches pairing on the road, in a country lane, as long ago as 1872.—A. G. BUTLER (Beckenham).

Hybrid Grey Geese.—The winter has passed without adding any fresh species to our Lakeland fauna, or favouring us with rarer visitors than a few Waxwings, Whoopers, and Bewick's Swans. One bird, however, has been obtained, which will be of permanent interest—a wild-bred hybrid between the Bean Goose and Grey Lag. This was shot a few weeks ago by my friend Mr. Thomas Mann, under the impression that it was a

Grey Lag; but the admixture of the characters of both species is well marked and interesting. The bill of this specimen most nearly resembles that of the Grey Lag, though there is a little black on the unguis and at the base of the bill. The feet, on the other hand, resemble those of the Bean Goose, but the two outer claws of both feet are white. The bird has recalled to mind an interesting hybrid which Mr. Blaaw presented to the Zoological Gardens a year or so ago. That bird had a Grey Lag's bill, but the feet closely resembled those of *Anser brachyrynchus* in coloration.—H. A. MACPHERSON (Carlisle).

Nesting of the Coot.—In his 'Manual of British Birds,' Mr. Howard Saunders states that young Coots are hatched "towards the end of May," and other authorities fix this as the approximate date; but I have never known this species remarked upon as being a regular early breeder. Mr. J. H. Salter, in 'The Field' of April 25th, 1891, reported his having seen a brood of Coots on April 10th on the river Cam, and from this he inferred that the first egg was laid on March 12th. This he evidently regarded as exceptionally early; but in Hampshire we can regularly count on finding Coots' eggs before the end of March. On March 24th, 1890, I found three nests containing eight, seven, and six eggs respectively; the first clutch was considerably incubated. On March 31st, 1891, I found a nest with nine eggs, incubated. On April 1st, 1892, Coots were unusually behindhand with us, but I found a nest with two eggs on that date. This year, on March 21st, two eggs had been laid. So although none of these dates are so early as that mentioned in 'The Field,' it will be seen that the Coot is, here at all events, an early breeder. On April 29th, 1891, I saw a brood of Coots about three weeks old; the keeper informed me that there was another brood about, of the same age.—SUTTON A. DAVIES (Winchester).

[We can confirm these remarks from personal observation. In West Sussex, where for many years we had good opportunities of studying the habits of waterfowl on two large pools, surrounded by game coverts and strictly preserved, Coots, Moorhens, Water Rails, Grebes, Ducks, Teal, Snipe, and Peewits used to nest regularly. The Coots were paired in March, and had young hatched by the end of April. We have seen broods on April 29th. The earliest date noted for Coots' eggs was April 5th, on which day we also found eggs of the Teal, Snipe, and Peewit.—ED.]

The Nutcracker in Lincolnshire.—With reference to Mr. Fieldsend's note (p. 153) on this bird in Lincolnshire, I may add that a Nutcracker, now in Mr. G. H. Caton Haigh's collection at Grainsby Hall, was obtained on Nov. 6th, 1888, in the parish of Marsh Chapel, near the Lincolnshire coast. This was just previous to the "great flight" of Woodcocks which came with a N.E. wind. It was recorded at the time by Mr. Haigh (Zool.

1889, p. 153), and also by myself in 'The Naturalist' for the same year (p. 44). Mr. Fieldsend's bird, therefore,—killed near Sleaford in March, 1833,—is not the only example recorded for this county.—JOHN CORDEAUX (Eaton Hall, Retford).

Stock Dove in Co. Wicklow.—While fishing in Wicklow, on April 2nd, I observed among some rocks about six miles south of Powerscourt Waterfall, a pair of Stock Doves, *Columba ænas*. On April 9th I again observed them amongst the same rocks, and conclude they will nest there if undisturbed. This shows an extension of its breeding range in Ireland. It has been known to nest near Powerscourt Waterfall within the last few years.—EDWARD C. BARRINGTON (15, Earlsford Terrace, Dublin).

Purple Gallinules in Norfolk and Sussex.—You ask (p. 105) for further information as to the two Purple Gallinules lately shot in Norfolk and Sussex. I have seen the one shot at Stoke Ferry, near Downham Market, and it is the grey-headed species of India, *Porphyrio poliocephalus*, Latham. Mr. J. Sandeman, of Westbrook, in answer to enquiry, tells me that the Sussex bird is also the Indian species. Probably they had escaped, but the Norfolk one shows no signs of confinement, excepting that it has lost half its tail. Its feet are smooth and clean beneath, and the nails perfect. The other was killed on a lawn by Mr. Sandeman's gardener, which is certainly suggestive of a prisoner escaped! I learn from Lord Lilford that he has kept many examples of *P. poliocephalus*, but has never lost one.—J. H. GURNEY (Keswick Hall, Norwich).

[The birds which escaped from Lord Lilford's aviaries were *Porphyrio smaragdonotus*, as mentioned in our last number (p. 147). But several of the Grey-headed species (*P. poliocephalus*) have been kept in a state of semi-domestication by Mr. Meade Waldo in Kent, and by Mr. Meinherzhagen in Hants, and the one killed in Sussex may have been one of these. We have no faith in the so-called "British-killed Purple Gallinules," and believe that everyone of these birds which has been shot or caught in a state of liberty must at some time or another have previously made its escape from a state of semi-domestication amongst ornamental waterfowl. The argument that such birds show no traces of confinement is of no value whatever, for under the conditions in which ornamental waterfowl are usually kept there is no more wear and tear than with truly wild birds.—ED.]

Ring Ouzel in Winter.—On Feb. 25th two adult males, showing an unusual amount of white on the wing, were seen by Mr. Hewetson, of Leeds, and myself near the coast-guard houses at Kilnsea, in Holderness. These, or others, had been observed early in the month, and no doubt came across at the same time and in company with the great flight of old Fieldfares and cock Blackbirds on or about the 4th of this month. I am informed that Ring Ouzels had arrived on the moors in the West Riding of Yorkshire

as early as March 18th this year, a very early date.—JOHN CORDEAUX (Eaton Hall, Retford).

Garganey near Hastings.—An adult male Garganey, or Summer Teal, *Querquedula circia*, was shot in the early part of this year in the Pett Level, near Hastings. Mr. William Borrer, in his 'Birds of Sussex' (pp. 438-9), mentions a few examples of this handsome little duck as having been captured in this county, the last recorded specimen having been an immature male, which was shot near Lewes on March 25th, 1870.—THOMAS PARKIN (Fairseat, High Wickham, Hastings).

SCIENTIFIC SOCIETIES.

LINNEAN SOCIETY OF LONDON.

April 6, 1893.—Prof. STEWART, President, in the chair.

Messrs. F. H. Baker and R. S. Standen were elected Fellows.

The President took occasion to refer to the great loss which botanical science had sustained by the death, on April 4th, of Professor Alphonse de Candolle, of Geneva, an announcement which was received with profound regret. Prof. de Candolle was the senior Foreign Member of this Society, having been elected in May, 1850, and was the recipient of the Society's Gold Medal in 1889.

Mr. Clement Reid exhibited and made some remarks upon the fruit of a South-European Maple, *Acer monspessulanum*, from an interglacial deposit on the Hampshire coast.

Mr. R. Lloyd Praeger, who was present as a visitor, exhibited some rare British plants from the Co. Armagh, and gave an account of their local distribution.

A paper was then read by Mr. W. B. Hemsley, on a collection of plants from the region of Lhassa, made by Surgeon Capt. Thorold in 1891, and a further collection from the Kuenlun plains, made by Capt. Picot in 1892. Some of the more interesting plants were exhibited, and critical remarks were offered by Messrs. C. B. Clarke, J. G. Baker, and Dr. Stapf.

Dr. H. C. Sorby gave a demonstration with the oxyhydrogen lantern, and exhibited a number of slides which he had prepared of small marine organisms, many of them extremely beautiful, mounted transparently so as to show the internal structure.

April 20.—Prof. STEWART, President, in the chair.

The Rev. A. B. Morris was admitted, and Mr. A. Trevor Battye was elected a Fellow of the Society.

In view of the approaching Anniversary Meeting, the election of Auditors took place, when Dr. Meiklejohn and Mr. E. A. Batters were nominated on behalf of the Council, and Messrs. Thos. Christy and W. F. Kirby on behalf of the Fellows.

The President took occasion to notice the retirement of Mr. F. H. Kingston after thirty-six years service as Lodge-keeper, and presented him with a testimonial in the shape of a cigar-case containing five-and-thirty pounds in bank-notes which had been subscribed on his behalf by all the Societies in Burlington House. After a suitable response on the part of the recipient, and *à propos* of the long residence referred to, attention was directed to some photographs of Burlington House, with the gateway as it existed before the rebuilding in 1868, and showing the old colonade, which had since been demolished, and was lying still uncared for in Battersea Park.

On behalf of Mr. C. Chilton, of Dunedin, N. Z., Mr. W. Percy Sladen gave an abstract of a paper on the subterranean Crustacea of New Zealand, with remarks on the fauna of caves and wells. The paper contained a *resumé* of previous publications on the subject, with additional information from the author's own observation, and an expression of his views on certain controversial points in connection therewith. His remarks were criticised by the President and by Prof. Howes, Dr. Henry Power, and Mr. G. Fookes.

A paper was then read by Mr. H. M. Bernard on the anatomy, physiology, and histology of the *Chernetidæ*, with special reference to the rudimentary stigmata, and to a new form of trachea, on which an interesting discussion ensued, and Mr. Bernard replied to the criticisms which were offered. The meeting adjourned to May 4th.

ZOOLOGICAL SOCIETY OF LONDON.

March 28, 1893. — Sir W. H. FLOWER, K.C.B., LL.D., F.R.S., President, in the chair.

A report was read, drawn up by Mr. A. Thomson, the Society's Head-keeper, on the insects bred in the Insect House during the past season.

A communication was read from Mr. Herbert Druce, giving an account of some new species of Lepidoptera Heterocera, chiefly from Central and South America.

Mr. F. E. Beddard read a paper on the brain of the African Elephant. The author gave reasons for disagreeing with some of the conclusions of Dr. Krueg, but confirmed others. The outline is more like that of the Carnivorous than the Ungulate brain, but the principal furrows appear to be arranged on a plan characteristic of the Elephantidæ.

Mr. W. T. Blanford showed that the various names hitherto employed in systematic works for the bird called by Jerdon the Himalayan Cuckoo

(*Cuculus himalayanus*, *C. striatus*, and *C. intermedius*) belonged to other species. He also gave reasons for not adopting S. Müller's *C. canoroïdes*, and accepted the term *C. saturatus*, Hodgson, as the correct scientific name.

A communication was read from Mr. F. M. Woodward entitled "Further Observations on the Genitalia of British Earthworms." This paper chiefly dealt with supplementary gonads which were found to be much more common than had been supposed; in one specimen an hermaphrodite gland was discovered in addition to testes and ovaries.

April 18.—Sir W. H. FLOWER, K.C.B., LL.D., F.R.S., President, in the chair.

The Secretary read a report on the additions that had been made to the Society's Menagerie during the month of March; and called special attention to three White-tailed Gnus, *Connochætes gnu*, from the Transvaal (a male and two females), obtained by purchase March 7th; and to three Springboks, *Gazella euchore*, from South Africa, deposited by H.R.H. the Prince of Wales.

Mr. Sclater exhibited and made remarks on a specimen of a curious variety of the Pig-tailed Monkey, *Macacus nemestrinus*, from the Baram River, lately living in the Society's Menagerie.

A communication was read from General Sir Lothian Nicholson, K.C.B., R.E., Governor of Gibraltar, respecting the Barbary Apes, *Macacus inuus*, living on the Rock of Gibraltar, which were stated to have increased of late years, and were now supposed to be nearly sixty in number.

Mr. W. L. Sclater made some remarks on the principal animals noted in the Zoological Gardens of Antwerp and Amsterdam, which he had lately visited.

A communication was read from Mr. A. E. Shipley, containing an account of the anatomy and histology of two Gephyrean worms of the genus *Sipunculus* from Zanzibar, together with a few observations on Sipunculids in general.

Mr. Oldfield Thomas gave an account of a small collection of Mammals obtained in Central Peru by Mr. J. Kalinowski. Amongst several species represented in this collection, either new or of such interest as to deserve a record, was especially noted a new form of Rodents of the family *Muridæ*, proposed to be called *Ichthyomys stolzmanni*.

Mr. H. J. Elwes read a communication from Mr. W. Warren describing a large number of new species and new genera of Moths of the family *Geometridæ*, from Sikkim and other districts of India, with notes on the localities and on other points.—P. L. SCLATER, *Secretary*.

ENTOMOLOGICAL SOCIETY OF LONDON.

April 12, 1893.—FREDERIC MERRIFIELD, Esq., Vice-President, in the chair.

Sir John Talbot Dillwyn Llewelyn, Bart., exhibited a number of specimens of Lepidoptera, Coleoptera, and Hymenoptera, all caught in Glamorganshire. The Lepidoptera included two remarkable varieties of *Vanessa io*, both obtained from the same brood of larvæ, from which the usual eye-like spots in the hind wings were absent; varieties of *Arctia menthastri*; a long series of melanic and other forms of *Boarmia repandata* and *Tephrosia crepuscularia*; and bleached forms of *Geometra papilionaria*. The Coleoptera included specimens of *Prionus coriarius*, *Pyrochroa coccinea*, *Otiiorhynchus sulcatus*, and *Astynomus ædilis*, which latter Sir John Llewelyn stated had been handed to him by colliers, who obtained them from the wooden props used in the coal mines, made out of timber imported from the Baltic. Mr. Merrifield, Dr. Sharp, Mr. Bower, and Mr. Stevens made some remarks on the specimens.

Sir John T. D. Llewelyn enquired whether the name of the moth which had a sufficiently long proboscis to fertilize the large Madagascan species of Orchis, *Angræcum sesquipedale*, was known. Mr. C. O. Waterhouse stated that the collections received at the British Museum from Madagascar had been examined with the view to the discovery of the species, but up to the present it had not been identified.

Mr. H. Goss exhibited, for Mr. Frank W. P. Dennis, of Bahia, Brazil, several nests of Trap-door Spiders containing living specimens of the spider, and read a communication from Mr. Dennis on the subject. Several photographs of the nests and the spiders were also exhibited. It was stated that Mr. Dennis had found these nests at Bahia in one spot only in a cocoa-nut grove close by the sea.

Mr. McLachlan read a paper entitled "On species of *Chrysopa* observed in the Eastern Pyrenees; together with descriptions of, and notes on, new or little-known Palæarctic forms of the genus." The author stated that the species referred to in this paper had been observed by him in the Eastern Pyrenees, in July, 1886, when staying with M. René Oberthür. After alluding to the nature of the district, and its capabilities from an entomological point of view, the paper concluded with descriptions of certain new palæarctic species of the genus. Dr. Sharp, who said that he was acquainted with the district, and Mr. Merrifield made some remarks on the paper.—H. Goss, *Hon. Secretary*.

NOTICES OF NEW BOOKS.

A Descriptive List of the Deer Parks and Paddocks of England.

By JOSEPH WHITAKER. 8vo, pp. 204, with Illustrations.
London: Ballantyne, Hanson & Co. 1892.

MANY people, doubtless, will regret that Mr. Whitaker has not attempted to bring out a new edition of Shirley's 'English Deer Parks,' which has long been out of print, and which, dealing with the history of the parks as well as with their contents, has a much wider scope than his own recent publication. To have corrected Shirley's mistakes (some of them important) and to have supplied additions, would have been an excellent undertaking, although it would have necessarily entailed a considerable expenditure of time and research. If, on comparison of the two books, that of Mr. Whitaker appears somewhat meagre in regard to the information given about each park, it has this merit, from the statistical point of view, that the list of English parks is more complete, and the acreage more exact.

Occasionally Mr. Whitaker is to be caught tripping, as on page 3 of his "Introduction," where a list of fifty parks is given, prefaced by the remark that "the under-mentioned parks described in Shirley's 'English Deer Parks, 1867,' no longer contain deer." But of these at least a dozen are not included by Shirley as existing parks, and seven others, though noticed by him as existing, had no deer in them at the date of his publication.

Again, while deducting these on the one hand, we might on the other hand add eight or nine names to the list of parks which no longer contain deer. This page of the book therefore requires considerable revision, but it is almost the only one on which any corrections of importance are needed.

On page 6, Mr. Whitaker observes, "Outside the park fences Fallow-deer have for centuries been found in an almost wild state in the New Forest and Epping Forest, and there is still a remnant of an ancient herd in Rockingham Forest, although their numbers are now reduced to about a dozen." To this paragraph might be joined that on p. 72, where it is stated that in the large tracts of open woodland around Hays Park, Here-

fordshire, which is very hilly and picturesque, lying close under Vinnall-Hill, wild Fallow-deer, said to have escaped originally from the park, are to be found; nine were shot in one day during the winter of 1891-92. To this it might be added that others are to be seen in the woodlands lying to the S.W. of Ludlow, and in St. George's Hills, near Weybridge, the descendants, doubtless, of of some that had escaped from park palings.

At p. 12, Mr. Whitaker remarks that Warnham Court, in Sussex, produces the largest deer in England, adding that a stag has been killed there exceeding 44 stone (of 8 lbs. to the stone), and with thirty-six points. It would have been well to explain that this abnormal growth of horn is to be accounted for by the dressing of bone manure which is spread over half the pasture in the park every year. As regards variation in colour, noticed on p. 15, attention is directed to a white or cream-coloured variety of the Red-deer with flesh-coloured noses and pale blue or straw-coloured eyes, to be found in some half-dozen parks, as at Windsor, Langley, Welbeck, Woburn, Alnwick, and Ashridge. In Badminton Park some of the Red-deer have white faces, and present that curiously unprepossessing appearance which is more familiar in the country inn sign of "The Bald-faced Stag."

It is curious to notice the difference in the weight of deer in different parks, according to the richness or otherwise of the pasture, and probably to the quantity and quality of the winter feeding. The average weight of a Fallow buck in good condition may be put down at 100 lbs., and a doe at 60 lbs., but these weights are in many parks exceeded by 20 lbs. where the conditions under which they are kept are especially favourable. In Biddlesden Park, Buckinghamshire, belonging to Colonel G. M. Morgan, a buck was killed a few years ago of the phenomenal weight of 157 lbs. clean. But there must be surely some mistake in the statement that in Crofton Park, Cumberland, the *average* weight of bucks is 195 lbs. and of does 175 lbs. We incline to think this must be a printer's error for 95 lbs. and 75 lbs. respectively.

As to the feeding and general management of deer, the Introduction contains a good deal of practical information, and may be consulted with advantage by all who have reason to suppose that the condition of their herds is capable of improvement.

There are some nice full-page illustrations, amongst which may be specially noticed "The Buck Gates in Thoresby Park, Notts," and "The Great Oak in Spetchley Park, Worcestershire," while as vignettes to some of the chapters we have examples of different styles of deer-fence as adopted in different parks. This must always be a matter of taste, but in our opinion nothing looks better, or harmonises more with the landscape, than the old-fashioned oak-paling, covered with lichens and mellowed with age. Mr. Whitaker is quite right in his assertion that for sylvan beauty and variety of timber, few landscapes can compare with an English deer-park.

*Horn Measurements and Weights of the Great Game of the World ;
being a Record for the use of Sportsmen and Naturalists.*

By ROWLAND WARD. 4to, pp. 264, with Illustrations.
London: published by the Author. 1892.

IT has become very much the fashion of late years to organise parties for big-game shooting in Africa, and although one cannot but deplore the wholesale and unnecessary destruction of many fine desert forms which are sacrificed to the greed of unreasonable sportsmen, we must, on the other hand, admit that many new species would probably not have been made known but for their acquisition by adventurous Englishmen.

Hence, when we read of the arduous journeys that have been undertaken, and the hardships that have been undergone, and the risks to human life that have been incurred in the pursuit of big-game, we cannot but excuse the pride with which a successful hunter exhibits some splendid head and horns, or other trophy which has been secured by his own prowess. This fashion in sport has naturally created a spirit of rivalry, and it is now-a-days the ambition of every hunter of big-game to eclipse his brother sportsmen in the size, weight, and horn-measurements of the trophies he brings home. Under these circumstances it is perhaps not surprising that, owing to the want of proper standards of comparison, much difference of opinion should prevail about "record" heads. What has long been wanting is a handbook to the big-game not only of Africa, but of other continents, giving precise and authoritative information

about every known species, together with the measurements ascertained upon a definite plan, and figures of typical specimens upon a sufficiently large scale for comparison.

The volume published recently by Mr. Rowland Ward, will to a certain extent supply this want, though it must be regarded rather in the light of a first attempt, to be improved in successive editions until a greater completeness is attained. It will be found useful for the large number of measurements, which are given in tabular form, of the horns of deer, antelopes, wild goats, wild sheep, and oxen, with the addition of the lengths of rhinoceros' horns, elephants' tusks, and the measurements of lions and tigers. From these figures a sportsman may calculate the average dimensions of a given species, and ascertain whether his own trophies are above or below the standard.

It is to be regretted that the treatment of the different species in this book is so unequal. Some of them, like Clarke's gazelle, Beatrix antelope, and Alaskan wild sheep, have a page or two of description accorded to them; the majority have only a table of measurements. In some cases the dimensions are given of twenty or thirty specimens, in others only two or three are noted; in several the habit given is erroneous or misleading, and in hardly one case do we find a reference to the first published description of a species, or indeed to any description whereby the reader may be guided to its identification. The inclusion of such references would have been extremely useful.

The illustrations, unfortunately, are very unequal. Some of them, such as the Reindeer, Moose, Hartebeeste, and Oryx, are good enough for the purpose, but a great many are drawn on too small a scale to be of any use. The heads of American big-game figured are quite inadequate; the Black-tailed Deer, the Prong-horn, and the Big-horn Sheep convey no idea of the wild beauty of the originals; and yet it would not have been difficult to photograph more typical examples, and reproduce by process blocks at a comparatively trifling cost. It is to be hoped that in a subsequent edition these blemishes may be removed, and the utility of the volume will be much enhanced.

THE ZOOLOGIST.

THIRD SERIES.

VOL. XVII.]

JUNE, 1893.

[No. 198.

THE CENTENARY ANNIVERSARY OF GILBERT WHITE.

IN the quiet little churchyard of Selborne, in Hampshire, far removed from the busy haunts of men, a plain headstone, with the inscription "G. W. June 26th. 1793," marks the spot where, exactly one hundred years ago, the Reverend Gilbert White was laid to rest. Against the chancel wall, at first on the outside, but subsequently for better preservation on the inside, is a marble tablet to his memory bearing the following inscription:—

IN THE FIFTH GRAVE FROM THIS WALL ARE INTERRED THE REMAINS OF

THE REV^d. GILBERT WHITE, M.A.

FIFTY YEARS FELLOW OF ORIEL COLLEGE, IN OXFORD,
AND HISTORIAN OF THIS HIS NATIVE PARISH.

HE WAS THE ELDEST SON OF JOHN WHITE, ESQUIRE, BARRISTER AT LAW
AND ANNE HIS WIFE, ONLY CHILD OF

THOMAS HOLT, RECTOR OF STREATHAM IN SURREY,
WHICH SAID JOHN WHITE WAS THE ONLY SON OF GILBERT WHITE,
FORMERLY VICAR OF THIS PARISH.

HE WAS KIND AND BENEFICENT TO HIS RELATIONS,
BENEVOLENT TO THE POOR,
AND DESERVEDLY RESPECTED BY ALL HIS FRIENDS AND NEIGHBOURS.

HE WAS BORN JULY 18TH, 1720, O.S.
AND DIED JUNE 26TH, 1793.

*Nec bono quicquam mali evenire potest
nec vivo, nec mortuo.*

This is the sole monument which at present exists to perpetuate the memory of one who has done more perhaps than
ZOOLOGIST.—JUNE, 1893.

any other of his countrymen to awaken a taste for Natural History and to encourage its pursuit. His letters on the Natural History and Antiquities of Selborne, addressed in the first instance to his friends Thomas Pennant and Daines Barrington, were collected in book form and printed in quarto in 1789—the sole edition which the author lived to see published, though very many have been issued since his death. Could he have foreseen the favour with which his book was received, he would never have preserved the diffident lines which he penned on the eve of its publication. Its great charm lies in its unaffected style, and the amount of accurate and instructive information which is conveyed in simple language; while it has the further merit of being original in design; not a compilation founded upon the researches of others, like so many books on Natural History which have preceded and followed it; but the clearly expressed results of his own personal observation within the narrow limits of a district which included few parishes beyond his own.

Born at Selborne on the 18th July, 1720, Gilbert White was the eldest son of John White, of that place, and grandson of the Rev. Gilbert White, Fellow of Magdalen College, Oxford, who was Vicar of the parish. His mother, Anne Holt, was a daughter of Thomas Holt, of Petersfield, who was likewise educated at Magdalen College, Oxford, and being preferred to the Rectory of Streatham, died there in 1710.

The marriage of Gilbert White's parents was solemnized at the parish church of Rogate, Sussex, on the 29th Sept., 1719. Though he himself was born, as stated, at Selborne on the 18th July following, it would seem that the family temporarily quitted that place, for it is on record that two sons, and two daughters who died in infancy, were born at Compton, near Guildford, while the sixth son Francis was born at Harting, Sussex, in March, 1729, after which they returned to Selborne, where the youngest two children, Anne and Henry, were born, the former in 1731, the latter in 1733. From this time, when Gilbert White was about thirteen years of age, they continued to reside in the old house, where both his mother and father died, the former in December, 1739, at the age of forty-six, the latter in October, 1758, at the age of seventy-one.

Concerning his boyhood no information exists beyond the fact mentioned by his nephew in a sketch prefixed to the second

quarto edition of his work, that he was educated at Basingstoke under the Vicar of that place, the Rev. Thomas Warton, the father of the Master of Winchester, and the Professor of Poetry at Oxford. In December, 1739, he went to Oriel College, Oxford, where in June, 1743, he took his degree of Bachelor of Arts, and in March, 1744, was elected a Fellow of his College, becoming Master of Arts in 1746. He received deacon's orders on April 27th, 1747, from the Bishop of Oxford, the eminent Thomas Secker, afterwards Archbishop of Canterbury, and was ordained priest by the Bishop of Hereford on March 11th, 1749, in the chapel in Spring Gardens, London. In October, 1751, he was appointed to the curacy of Selborne, which he temporarily resigned in April, 1752, to enter on his duties at Oxford as Junior Proctor of the University.

The statement which has passed current to the effect that he gave up shooting on his being ordained is erroneous. Not only is this proved by the frequent entries in his accounts of the purchase of the usual necessaries for the sport, and by the fact that he kept several sporting dogs both at Oxford and Selborne, but we also find occasional allusions in his letters which show that he continued to follow the sport, although not to an advanced age; and it is extremely probable that he occasionally made it subservient to the pursuit of the Ornithology of the district.*

He quitted Oxford in the spring of 1753, and on the 9th September in that year became Curate of Durley, near Bishops' Waltham, where he officiated until the 9th March, 1755, when he returned to live at Selborne. Shortly after his father's death, in 1758, he became Curate of the neighbouring parish of Faringdon, where he officiated regularly until 1784, when (as he remarked in a letter to his sister, Mrs. Barker) Mr. Taylor, the new Vicar of Selborne, having taken possession of his living, he "reassumed the curacy after an interruption of twenty-six years."

From this time he renounced all intention of accepting any clerical preferment which would take him from his ancestral home at Selborne, and, as a matter of fact, he refused several livings which from time to time were offered him in other counties.

* Memoir prefixed to Bell's edition of the 'Natural History of Selborne,' 1877, vol. i., pp. xxxiii—xxxiv.

He found sufficient occupation in the discharge of his clerical duties, in the study of local natural history and antiquities, and in correspondence with those of kindred tastes, amongst whom may be mentioned not only Pennant and Daines Barrington, to whom his letters about Selborne were addressed, but also Sir Joseph Banks; William Markwick, of Catsfield, near Battle, author of a 'Catalogue of the Birds of Sussex'; Robert Marsham, of Stratton Strawless, Norfolk, an authority on trees; Dr. Chandler, the Oxford antiquary, who helped him in his researches on the antiquities of Selborne; Dr. Nash, the historian of Worcestershire; the Rev. John Lightfoot, author of 'Flora Scotica'; Col. Montagu, author of the 'Ornithological Dictionary'; and (not to mention others) his brother, John White, who was Vicar of Blackburn, Lancashire, and who with the tastes of a naturalist had travelled in Spain, while Chaplain at Gibraltar, and had furnished him with some account of the birds of that country.

We are indebted to Mr. R. J. Howard, of Blackburn, for a photograph of the mural tablet which is erected to the memory of John White in the parish church at Blackburn, on which is the following inscription:—

UNDER THE COMMUNION TABLE IS INTERRED
THE REV^D. JOHN WHITE, B.A.
WHO DEPARTED THIS LIFE NOV^R 21ST 1780
AGED 53 YEARS
HE WAS A SINCERE CHRISTIAN & CONSCIENTIOUS PASTOR,
AN AFFECTIONATE HUSBAND & GOOD PARENT;
A KIND & FAITHFUL FRIEND,
AN INGENIOUS & ACCURATE NATURALIST.

It is to be regretted that John White's journal of his travels in Spain was never printed, although he was frequently urged by the historian of Selborne to revise it with a view to publication.

Gilbert White did not long survive the appearance of his own work; it was published in 1789; he died in 1793. He was never married, though at one time it was supposed he would have found an excellent wife in Miss Hester Mulso, for whom he had an early regard, but who, in 1760, became Mrs. Chapone.

Of his personal appearance a slight notion may be formed from the brief description given by his nephew, the Rev. Francis

White, who remembered him well, and who informed Prof. Bell that he was only five feet three inches in stature, of a spare form and remarkably upright carriage. He never would sit for his portrait, and no likeness of him is extant. Many persons suppose that the clergyman represented in the folding frontispiece to the first edition of his work is intended for himself; but this is not the case. Of the figures there introduced, the first is the Rev. Robert Yalden, Vicar of Newton Valence; second, Mr. ETTY, brother of the Vicar of Selborne; third, Mrs. Yalden; and fourth, Thomas Holt White, Gilbert's brother.

"The expression of his countenance," says Prof. Bell, "was (as those who knew him have recorded) intelligent, kindly, and vivacious; his constitution sound and vigorous; his manners courteous and affable."

The notion of erecting some memorial in his honour, and to mark the centenary anniversary of his death, is not only natural at the present time, but will undoubtedly commend itself to those who have derived pleasure and instruction from a perusal of his work, and have paused to consider the good and lasting effect which has resulted from its publication. Regarded merely from an educational point of view, the book has wrought an incalculable amount of good, and it is right that this should be publicly recognized.

There are some doubtless who may consider that the best memorial of a man is to be found in his works, and that nothing further is needed to remind us of him. But were this view to be generally accepted, how little would the rising generations know of the great men who have preceded them. A statue or other memorial in a public place may be seen by many who have not read the book, and perhaps have never heard of it. The sight of the one may induce enquiry for the other, and so lead to its being still more widely known. It is not a little curious that the late Richard Jefferies, within a few months of his death, had a marble bust erected to his memory in Winchester Cathedral, while the memory of Gilbert White has been suffered to remain unhonoured for a century. And yet there is no comparison between the writers. Jefferies possessed the art of word-painting, and could describe in minute and pleasing detail whatever natural object took his fancy for the moment; but the information conveyed by his writing is of the slenderest descrip-

tion. The letters of Gilbert White, on the contrary, are full of instructive observations; they contain more facts, and less of that ornate embellishment which after a few pages tends to weary the reader while it teaches him nothing. Assuming, then, that the author of the 'Natural History of Selborne' has good claim to a memorial, two points suggest themselves for consideration, namely, *where* should the memorial be erected? and *what form* should it take?

Selborne, no doubt, as the birth-place and last resting-place of Gilbert White, would, in the eyes of many, appear the most fitting spot to choose. But Selborne lies far out of the beaten track of ordinary wayfarers. Five miles from the unimportant station of Liss, on the main line to Portsmouth, the sight of any memorial to be erected there would necessitate a special pilgrimage, while it is evident that once we have reached the village we are surrounded by memorials of Gilbert White in his dwelling-house, the old yew-tree, the plestor, the well-head, the zig-zag, and other objects in the landscape with which his book has made us familiar.

What seems preferable, therefore, is the erection of a memorial in a more public place, where it may be viewed by a greater number of people, and yet be in Gilbert White's own county. Such a spot is to be found in the borough-town of Petersfield, only one station beyond Liss, the most important place between Guildford and Portsmouth, a busy centre of attraction at the time of the elections, thronged on market-days with visitors from all parts, and a chosen halting-place for many a corps of volunteers.

On the farther side of the Heath Pond is a bit of rising ground which, were it available, presents as fair a site as could be selected for such a memorial as is now contemplated.

Ascending this slope, on the summit of which some rustic seats might be disposed, and looking back over the water towards the red-roofed houses beyond, we have spread before us one of those charming landscapes in which Gilbert White himself so much delighted, and which tend to put one in that contemplative frame of mind which paves the way for a proper appreciation of his book. Here we may realize the sentiments which inspired the "Naturalist's Summer Evening Walk." For while—

“ the still owl skims round the grassy mead,
And eke the timorous hare limps forth to feed,
We see the swallow sweep the darkening plain,
Belated, to support her infant train ;
Or mark the swift, in rapid, giddy ring,
Dash round the steeple, unsubdued of wing.”

And the invitation which follows reads most appropriately—

“ While deepening shades obscure the face of day,
To *yonder bench*, leaf-sheltered, let us stray,
Till blended objects fail the swimming sight,
And all the fading landscape sinks in night.”

These considerations appear to outweigh any that could be advanced in behalf of a site in the town.

As to the *form* which the memorial should take, no doubt opinions will differ. The idea of a stained-glass window, or a marble monument in a church, could hardly be entertained, except upon the understanding that the memorial should be erected at Selborne. Elsewhere a marble bust, or full-length figure of the man whom it is intended to honour, naturally suggests itself.

But here a difficulty arises in the fact that no portrait of Gilbert White exists. We know that in height he was only five feet three inches; that he was of spare form and upright carriage; that the expression of his countenance was intelligent, kindly and vivacious. All this we know from the relation of his own nephew; and we know, moreover, the characteristic dress of a clergyman of the last century. But what sculptor could venture, on this bare description, to chisel out of marble the lineaments of a face of which no actual portrait has been preserved? It has been suggested that as the sculptor's art might achieve everything but the features, these might be left to imagination, and be artistically concealed by the device of flexing one arm across the face, while in the extended hand of the other arm might lie the dead body of some favourite bird. This would mark a pleasing trait in the character of the Hampshire naturalist, and at the same time point that moral which it was always his endeavour to inculcate. At his feet might be represented the old tortoise, “Timothy,” of which he has left so amusing an account.

Should this suggestion appear incompatible with the strict canons of the sculptor's art, an argument in its favour may be borrowed from antiquity; and just as we contemplate with admiration the beautiful outlines and just proportions of some old Greek statue of which the features have perished, so we may learn to look with pleasure upon a statue which, accurately representing the dress and figure of the English naturalist, may sufficiently remind us of the man without actually portraying his features.

On the other hand, there would be no difficulty in designing a monument without a statue, which should be emblematical of the avocation of the naturalist, and which, by means of sculptured figures of some of the animals and plants in which he most delighted, might serve to remind the spectator of the services rendered by the historian of Selborne.

But whatever decision may be arrived at on this point, the present aim of the writer is simply to call attention to the near approach of the centenary anniversary of an English worthy, and to suggest that now, if ever, is the fitting time to do honour to his memory. And here it will be proper to remark that this appeal to the naturalists of the United Kingdom is not the first that has been made. So long ago as the autumn of 1891 an enthusiastic disciple of Gilbert White, in the person of the Rev. Prebendary Gordon, Vicar of Harting, near Petersfield, convened a meeting at the latter town, and in the course of an able lecture set forth the claims of Gilbert White to some public recognition of his services in the cause of Natural History. The Vicar of Petersfield, the Rev. F. J. Causton, warmly supported the cause, as did also Mr. Peile, the Vicar of Selborne, though the last-named gentleman, very naturally, was of opinion that whatever was done in honour of Gilbert White should be done at Selborne. It is somewhat curious that the good people of Selborne should have allowed a century to elapse before arriving at this conclusion. There is no reason, of course, why Selborne and Petersfield should not *both* erect memorials, though concerted action would be desirable; and the formation of a local committee with this object would pave the way for an appeal to the naturalists of this country—an appeal to which, we venture to think, there would be from every quarter a hearty and generous response.

A CATALOGUE OF LOCAL LISTS OF BRITISH MAMMALS,
REPTILES, & FISHES, ARRANGED UNDER COUNTIES.

By MILLER CHRISTY, F.L.S.

MAMMALS.

(Continued from p. 186.)

SCOTLAND.

GENERAL.

PENNANT, W.—[The Mammals of Scotland.] In the Rev. G. Lightfoot's *Flora Scotica*, vol. i, pp. 1-15 & 50-51. London, 2 vols. dy. 8vo, 1777. (Includes domestic and extinct animals.)

ALSTON, EDW. R.—On the Mammalia of the West of Scotland. In *Notes on the Fauna and Flora of the West of Scotland*, pp. v-viii. Glasgow, cr. 8vo, 1876. (A very good list.)

ALSTON, EDW. R.—[The Mammalia of Scotland.] In *The Fauna of Scotland, with special reference to Clydesdale and the Western District*. Glasgow, 39 pp. dy. 8vo, 1880. (A very valuable list; enumerates 51 living species; issued by the Glasgow Natural History Society).

ABERDEENSHIRE.

MACGILLIVRAY, Prof. WM.—Mammals [of Braemar.] In his *Natural History of Deeside and Braemar*, pp. 384-391 & 457-488. London, dy. 8vo, 1855. (An admirable list; enumerates 26 species.)

HORN, WM.—Notes on the Mammalia of Buchan. *Proc. Nat. Hist. Soc. of Glasgow*, vol. v, pp. 228-234. Glasgow, dy. 8vo, 1884. (A good list; enumerates 34 species.)

ARGYLL.

HARVIE-BROWN, J. A., & T. E. BUCKLEY.—[The Mammals of Argyll and the Inner Hebrides.] In their *Vertebrate Fauna of Argyll & the Inner Hebrides*, pp. 1-48. Edinburgh, fcap. 4to, 1892.

BANFFSHIRE.

EDWARD, THOS.—Mammals [of Banffshire.] In Smiles's *Life of a Scotch Naturalist*, pp. 391-394. London, dy. 8vo, 1876. (Enumerates 35 species; a good list; a second edition, without the Faunal Lists, was published in 1882).

BERWICKSHIRE.

EVANS, WM.—The Mammalian Fauna of the Edinburgh District, with records of the occurrences of the rarer species throughout the South-East of Scotland generally. Edinburgh, 124 pp. dy. 8vo, 1892. (A very valuable list; enumerates 48 species; "is substantially a reprint of a paper forming a part of *Proceedings of the Royal Physical Society*, 1890-91 (vol. xi,

pp. 85-171)"; treats of East Lothian, Midlothian, West Lothian, Peebles, Fife, Kinross, & Clackmannan, with parts of the counties of Berwick, Roxburgh, Selkirk, Lanark, Stirling, & Perth.)

BUTE.

COLQUHOUN, JOHN.—[Notes on the Mammals of Bute.] In his *Sporting Days*, pp. 100-101. Edinburgh & London, cr. 8vo, 1866.

CAITHNESS.

THOMSON, REV. CHAS.—[Mammals of the Wick District.] *New Statistical Account of Scotland*, vol. xv, p. 149. London and Edinburgh, dy. 8vo, 1845.

HARVIE-BROWN, J. A., & T. E. BUCKLEY.—[The Mammals of Caithness.] In their *Vertebrate Fauna of Sutherland, Caithness, and West Cromarty*, pp. 65-96 & 303-304. Edinburgh, 4to, 1887. (An admirable list.)

CLACKMANNAN.

EVANS, WM.—The Mammalian Fauna of the Edinburgh District, with records of the occurrences of the rarer species throughout the South-East of Scotland generally. See BERWICKSHIRE.

CROMARTY.

HARVIE-BROWN, J. A., & T. E. BUCKLEY.—[The Mammals of West Cromarty.] In their *Vertebrate Fauna of Sutherland, Caithness, and West Cromarty*, pp. 65-96 & 303-304. Edinburgh, 4to, 1887. (An admirable list.)

DUMBARTONSHIRE.

GRAY, ROBT.—[Sketch of the Mammals of the Trossachs and Loch Lomond District.] In Maclure & Macdonald's *Guide to the Trossachs & Loch Lomond*. (Not seen; vide *Proc. Nat. Hist. Soc. of Glasgow*, vol. iii, 1878, p. 187.)

FIFESHIRE.

CLARKE, WM. EAGLE.—Mammals of the Forth Valley. In *Pollock's Dictionary of the Forth*. Edinburgh, dy. 8vo, 1891. (Not seen.)

EVANS, WM.—The Mammalian Fauna of the Edinburgh District, with records of the occurrences of the rarer species throughout the South-East Coast of Scotland generally. See BERWICKSHIRE.

FORFARSHIRE.

DON, G.—[The Mammals of Forfarshire.]—In the Rev. Jas. Headrick's *General View of the Agriculture of . . . Forfarshire*, pp. 454-461 & App. pp. 37-39. Edinb. & London, dy. 8vo, 1818. (Enumerates about 27 species.)

HADDINGTONSHIRE.

CLARKE, WM. EAGLE.—Mammals of the Forth Valley. In *Pollock's Dictionary of the Forth*. Edinburgh, cr. 8vo, 1891. (Not seen.)

EVANS, WM.—The Mammalian Fauna of the Edinburgh District, with records of the occurrences of the rarer species throughout the South-East of Scotland generally. See BERWICKSHIRE.

HEBRIDES.

MACGILLIVRAY, JOHN.—Notes on the [Mammals of the] Outer Hebrides. *Annals & Mag. of Nat. Hist.*, vol. viii, pp. 7-9. London, dy. 8vo, 1842.

DUNS, Prof.—[The Mammals of Lewis.] *Proc. Roy. Soc. of Edinb.*, vol. v, p. 616. Edinb., 8vo, 1866. (Enumerates 13 species.)

SMITH, W. ANDERSON.—[The Mammals of Lewis.] In his *Lewisiana*, pp. 208-214. London, cr. 8vo, 1875. (A fair list.)

SCOT-SKIRVING, R.—[Note on the Mammals of Islay.] In his paper on the Natural History of Islay, in *Proc. Roy. Phys. Soc. of Edinb.*, vol. iv, pp. 70-71. Edinb., 8vo, 1878.

HARVIE-BROWN, J. A.—On the Mammalia of the Outer Hebrides. *Proc. Nat. Hist. Soc. of Glasgow*, vol. iv, pp. 88-107. Glasgow, dy. 8vo, 1881. (A valuable list; enumerates 18 species.)

HARVIE-BROWN, J. A., & T. E. BUCKLEY.—[The Mammals of the Outer Hebrides.] In their *Vertebrate Fauna of the Outer Hebrides*, pp. 13-43 & 250. Edinburgh, fcap. 4to, 1888. (A most admirable list.)

HARVIE-BROWN, J. A., & T. E. BUCKLEY.—[The Mammals of Argyll & the Inner Hebrides.] In their *Vertebrate Fauna of Argyll & the Inner Hebrides*, pp. 1-48. Edinb., fcap. 4to, 1892.

INVERNESS-SHIRE.

DUNS, Prof. J.—[The Mammals of Mid-Lochabar.] *Proc. Roy. Phys. Soc. of Edinb.*, vol. vii, pp. 157-158. Edinburgh, dy. 8vo, 1883. (Enumerates 26 species.)

KINROSS.

EVANS, WM.—The Mammalian Fauna of the Edinburgh District, with records of the occurrences of the rarer species throughout the South-East of Scotland generally. See BERWICKSHIRE.

KIRKCUDBRIGHT.

[SERVICE, ROBT.]—[Mammals of Kirkcudbright.] In *Maxwell's Guidebook to the Stewartry of Kirkcudbright*, 4th ed., pp. 140-143. Castle-Douglas, cr. 8vo, 1884. (A fair list; enumerates about 30 species.)

LANARKSHIRE.

KING, THOS.—[The Mammals of Clydesdale & the West of Scotland.] In *A Contribution towards a Complete List of the Fauna & Flora of Clydesdale & the West of Scotland*, pp. 5-6. Glasgow, cr. 8vo, 1876. (A good list; enumerates 32 species.)

EVANS, WM.—The Mammalian Fauna of the Edinburgh District, with records of the occurrences of the rarer species throughout the South-East of Scotland generally. See BERWICKSHIRE.

LINLITHGOWSHIRE.

CLARKE, WM. EAGLE.—Mammals of the Forth Valley. In *Pollock's Dictionary of the Forth*. Edinburgh, cr. 8vo, 1891. (Not seen.)

EVANS, WM.—The Mammalian Fauna of the Edinburgh District, with records of the occurrences of the rarer species throughout the South-East of Scotland generally. See BERWICKSHIRE.

MIDLOTHIAN.

RHIND, WM.—[Mammals of the Edinburgh District.] In his *Excursions illustrative of the Geology & Natural History of the Environs of Edinburgh*, pp. 132-133. Edinb. & Lond. dy. 8vo, 1836. (Enumerates 22 species.)

CLARKE, WM. EAGLE.—Mammals of the Forth Valley. In *Pollock's Dictionary of the Forth*. Edinburgh, cr. 8vo, 1891. (Not seen.)

EVANS, WM.—The Mammalian Fauna of the Edinburgh District, with records of the occurrences of the rarer species throughout the South-East of Scotland generally. See BERWICKSHIRE.

MORAY.

GORDON, Rev. G.—[The Mammals of Moray.] *Zoologist*, vol. ii, pp. 421-428. London, dy. 8vo, 1844.

ORKNEY.

BARRY, Rev. GEO.—[The Mammals of Orkney.] In his *History of the Orkney Islands*, pp. 297-298 & 314-326. Edinburgh & London, dy. 8vo, 1805. (Enumerates 18 wild species; reprinted *verbatim* in the 2nd ed., London, dy. 4to, 1808, pp. 303-305 & 320-331; also in the 3rd ed., Kirkwall, cr. 8vo, 1867, pp. 290-291 & 306-316.)

Low, Rev. GEO.—[The Mammals of Orkney.] In his *Fauna Orcadensis*, pp. 1-29 & 157-166. Edinburgh, dy. 4to, 1813. (Enumerates 17 wild species.)

DUNN, ROBT.—[The Mammals of the Orkney Islands.] In his *Ornithologist's Guide to the Islands of Orkney & Shetland*, pp. 118-121. London & Hull, med. 8vo, 1837. (Enumerates 4 wild species only.)

BAIKIE, W. D., & ROBT. HEDDLE.—[The Mammals of Orkney.] In their *Historia Naturalis Orcadensis*; Zoology, part i, pp. 11-24. Edinburgh, dy. 8vo, 1848. (A good list; enumerates 46 species, including those domesticated.)

BUCKLEY, T. E.—A few notes on the Mammals and Birds of Rousay [Island]. *Proc. & Trans. Nat. Hist. Soc. of Glasgow*, n. s., vol. i, pp. 44-76. Glasgow, dy. 8vo, 1887. (A valuable list; enumerates 10 species.)

BUCKLEY, T. E., & J. A. HARVIE-BROWN.—[The Mammals of the Orkney Islands.] In their *Vertebrate Fauna of the Orkney Islands*, pp. 61-90. Edinburgh, fcap. 4to, 1891. (An admirable account.)

PEEBLESSHIRE.

[NEILL, PATRICK.]—[The Mammals of Tweeddale.] In *The Works of Alexander Pennecuik, Esq.*, pp. 103-104. Edinburgh, &c., dy. 8vo, 1815. (Enumerates 19 wild species.)

CHAMBERS, W.—[The Mammals of Peeblesshire.] In his *History of Peeblesshire*, p. 525. Edinburgh & London, roy. 8vo, 1864. (An incomplete list.)

EVANS, WM.—The Mammalian Fauna of the Edinburgh District, with records of the occurrences of the rarer species throughout the South-East of Scotland generally. See BERWICKSHIRE.

PERTHSHIRE.

HORN, WM.—The Mammalia of North-west Perthshire. *Proc. Nat. Hist. Soc. of Glasgow*, vol. v, pp. 119-126. Glasgow, dy. 8vo, 1884. (A good list; enumerates 26 living species.)

EVANS, WM.—The Mammalian Fauna of the Edinburgh District, with records of the occurrences of the rarer species throughout the East of Scotland generally. See BERWICKSHIRE.

ROSS-SHIRE.

DIXON, JOHN H.—The Mammals of Gairloch. In his *Gairloch, &c.*, pp. 232 & 236-241. Edinburgh, dy. 8vo, 1886. (A very good list.)

ROXBURGHSHIRE.

EVANS, WM.—The Mammalian Fauna of the Edinburgh District, with records of the occurrences of the rarer species throughout the South-East of Scotland generally. See BERWICKSHIRE.

SELKIRKSHIRE.

EVANS, WM.—The Mammalian Fauna of the Edinburgh District, with records of the occurrences of the rarer species throughout the South-East of Scotland generally. See BERWICKSHIRE.

SHETLAND.

EDMONDSTON, AR.—[The Mammals of Shetland.] In his *View of the Ancient and Present State of the Zetland Islands, &c.*, vol. ii, pp. 205-226 & 291-301. Edinburgh & London, 2 vols., dy. 8vo, 1809. (Relates almost exclusively to domestic species and cetaceans.)

Low, Rev. GEO.—[The Mammals of Shetland.] In his *Fauna Orcadensis*, pp. 1-29 & 157-166. Edinburgh, dy. 4to, 1813. (Enumerates 17 wild species.)

DUNN, ROBERT.—[The Mammals of the Shetland Islands.] In his *Ornithologist's Guide to the Islands of Orkney & Shetland*, pp. 118-121. London & Hull, med. 8vo, 1837. (Enumerates 4 wild species only.)

STIRLINGSHIRE.

LUMSDEN, JAMES.—The Mammals of the Neighbourhood of Loch Lomond. *Proc. Nat. Hist. Soc. of Glasgow*, vol. iii, pp. 186-191. Glasgow, dy. 8vo, 1878. (A good list; enumerates 26 species.)

GRAY, ROBT.—[Sketch of the Mammals of the Trossachs and Loch Lomond District.] In Maclure & Macdonald's *Guide to the Trossachs & Loch Lomond*. (Not seen; vide *Proc. Nat. Hist. Soc. of Glasgow*, vol. iii, 1878, p. 187.)

CLARKE, WM. EAGLE.—Mammals of the Forth Valley. In *Pollock's Dictionary of the Forth*. Edinburgh, cr. 8vo, 1891. (Not seen.)

EVANS, WM.—The Mammalian Fauna of the Edinburgh District, with records of the occurrences of the rarer species throughout the East of Scotland generally. See BERWICKSHIRE.

SUTHERLANDSHIRE.

ALSTON, EDW. R., & J. A. HARVIE-BROWN.—On the Mammals and Reptiles of Sutherlandshire. *Proc. N. H. Soc. of Glasgow*, vol. ii, pp. 138-149. Glasgow, dy. 8vo, 1876. (Enumerates 27 species.)

BUCKLEY, T. E., & J. A. HARVIE-BROWN.—[The Mammals of Sutherlandshire.] In St. John's *Tour in Sutherlandshire*, ed. 2, vol. ii, pp. 322-329. Edinburgh, cr. 8vo, 1884. (An admirable list; enumerates 32 existent species.)

HARVIE-BROWN, J. A., & T. E. BUCKLEY.—[The Mammals of Sutherland.] In their *Vertebrate Fauna of Sutherland, Caithness & West Cromarty*, pp. 65-96 & 303-304. Edinburgh, fcap. 4to, 1887. (An admirable account.)

IRELAND.

GENERAL.

TEMPLETON, ROBERT.—[The Mammals of Ireland.] *Mag. of Nat. History*, new series, vol. i, pp. 403-404. London, dy. 8vo, 1837. (Enumerates 25 species.)

THOMPSON, WM.—[The Mammals of Ireland.] In his *Report on the Fauna of Ireland*, in the *Report of the British Association for 1840*, pp. 358-363 & 401. London, dy. 8vo, 1841. (A good list; enumerates 31 species.)

THOMPSON, WM.—[The Mammals of Ireland.] In his *Natural History of Ireland*, vol. iv, pp. 1-60. London, dy. 8vo, 1856. (An admirable list.)

ANTRIM.

MARSHALL, Dr. J. D.—[Mammals of the Island of Rathlin.] *London & Edinburgh Philosophical Magazine*, 3rd series, vol. vii, p. 492. London, dy. 8vo, 1835. (Mentions four species only.)

BELFAST NATURALISTS' FIELD CLUB, MEMBERS OF.—[The Mammals of the Belfast District.] In their *Guide to Belfast & the Adjacent Counties*, pp. 91-95. Belfast, fcap. 8vo, 1874. (A fairly extensive list.)

PATTERSON, R. L.—[Cetacea of Belfast Lough.] In his *Birds, Fishes, and Cetacea commonly frequenting Belfast Lough*, pp. 189—202. Belfast, dy. 8vo, 1880. (2nd ed., London & Belfast, dy. 8vo, 1881.)

CORK.

HARVEY, Dr. J. R.—[The Mammals of the County of Cork.] In his *Contributions towards a Fauna & Flora of the County of Cork*, pp. 1-3. London & Cork, dy. 8vo, 1845. (A good list; enumerates 24 species.)

DONEGAL.

STEWART, JOHN V.—A List of, and Remarks on, some of the Mammalious Animals . . . met with in the three years preceding Dec. 4, 1828, on the Northern Coast of Donegal. *Loudon's Mag. of Nat. History*, vol. v, pp. 578-579. London, dy. 8vo, 1832.

MAHONY, JAS. A.—[The Mammals of County Donegal.] *Proc. Nat. Hist. Soc. of Glasgow*, vol. iii, pp. 157-158. Glasgow, dy. 8vo, 1878. (Enumerates only 6 species.)

DOWN.

BELFAST NATURALISTS' FIELD CLUB, MEMBERS OF.—[The Mammals of the Belfast District.] In their *Guide to Belfast & the Adjacent Counties*, pp. 91-95. Belfast, fcap. 8vo, 1874. (A fairly extensive list.)

KNOX, ALEX.—[Mammals of the County Down.] In his *History of the County Down*, pp. 621-630. Dublin, dy. 8vo, 1875. (A fairly good list; includes domestic animals.)

DUBLIN.

RUTTY, JOHN.—The Quadrupeds of the County of Dublin. In his *Essay towards a Natural History of the County of Dublin*, vol. i, pp. 263-293. Dublin, 2 vols., dy. 8vo, 1772. (A fairly good list; includes domestic animals.)

BARRINGTON, R. M.—[The Mammals of the County Dublin.] In the *Guide to the County of Dublin*, part ii, pp. 90-91. Dublin, dy. 8vo, 1878. (A good list.)

LONDONDERRY.

N., H.—[Mammals of the vicinity of Londonderry.] In *Loudon's Mag. Nat. History*, vol. iv, pp. 452-453.

WEXFORD.

BARRETT-HAMILTON, G. E. H.—The Mammals of the County Wexford; in *Fauna & Flora Co. Wexford*. (In preparation.)

WICKLOW.

BARRINGTON, R. M.—[The Mammals of the County Wicklow.] In the *Guide to the County of Dublin*, pt. ii, pp. 90-91. Dublin, dy. 8vo, 1878. (A good list.)

Taking England first, we find that, while some counties (such as Cornwall, Durham, Devon, Essex, Norfolk, Northumberland, and Yorkshire) have been pretty fully treated, a number of important counties do not appear at all in the list. These are Berkshire, Buckinghamshire, Hertfordshire, Middlesex, Monmouth, Nottingham, and Surrey. Moreover, the information under some other counties is very inadequate, as Cheshire, Bedford, Cambridge, Hereford, Huntingdon, Kent, Lincoln, Northampton, Oxford, Warwick, and Wilts. As regards Wales, it is remarkable how little has been printed. The mammals of Scotland seem to have been particularly well observed and catalogued. Every Scottish county, with eight exceptions (Ayr, Dumfries, Elgin, Kincardine, Kinross, Nairn, Renfrew, and Wigton), appears in the list, though Inverness, Ross, and some others have received but inadequate attention. Ireland seems to have been much neglected. Only seven counties have been dealt with, and it may be said that the Catalogue does not indicate more than two good modern lists.

(To be continued.)

THE AUDUBON MONUMENT IN NEW YORK CITY.

ON the 26th April last, at Trinity Cemetery, in New York City, in the presence of many thousand spectators, there was unveiled a monument to the naturalist John James Audubon, whose death occurred in January, 1851, and to whose memory no tribute had been erected save a plain tombstone bearing the single word "Audubon."

Invitations to the ceremony had been issued to all the Members of the American Ornithologists' Union, and the leading biological societies of the United States, and were extended even to naturalists in this country, amongst whom the Editor of this journal had the honour of being included.

The monument, which was unveiled by Miss Audubon, a granddaughter of the deceased, is an artistic monolith of North River bluestone, on which are sculptured figures of the wild animals and game birds of North America. Terminating in a Runic cross, it stands on a pediment of the same stone, which in turn rests upon a granite foundation. On the northern face of the pediment is a medallion bust in high relief of the naturalist, with the name "Audubon" in raised letters beneath it. On the east face are sculptured guns and other weapons of the chase; on the west face an artist's palette, and brushes; and on the south face an inscription as follows:—

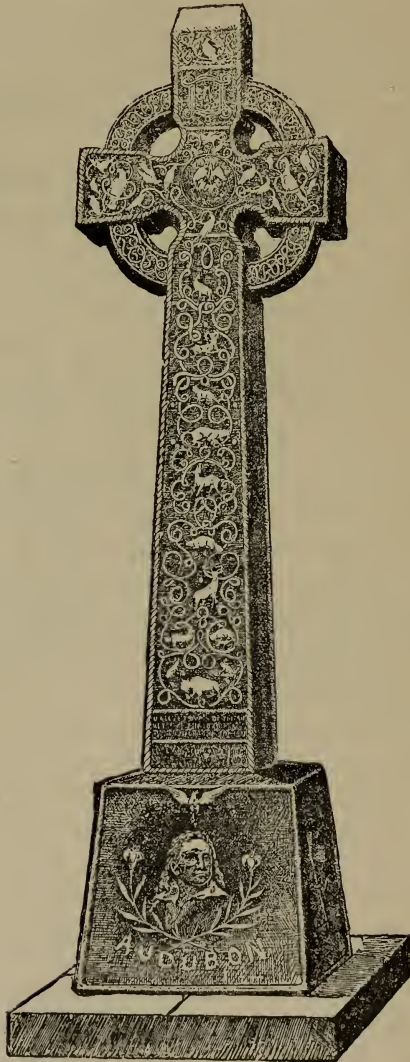
ERECTED
 TO THE MEMORY OF
 JOHN JAMES AUDUBON
 IN THE YEAR 1893
 BY SUBSCRIPTIONS RAISED
 BY THE
 NEW YORK ACADEMY OF SCIENCES.

At the base of the shaft on the north side is the text from the *Benedicite*:—

"O, all ye Fowles of the Air, bless ye the Lord; praise Him and magnify Him for ever."

Above this, running up to the cross, are carved a number of figures of different birds. On the south side of the shaft are

figures of mammals, a Bison, an Elk, a Beaver, and others, and beneath them, at the foot of the shaft, another verse from the *Benedicite* :—



“O, all ye Beasts and Cattle, bless ye the Lord; praise Him and magnify Him for ever.”

An address was delivered by Dr. Thomas Eggleston, in which, on behalf of the subscribers to the memorial, and especially on

behalf of the New York Academy of Sciences, he expressed his gratification at the completion of the monument, which he committed to the care of the Rev. Morgan Dix, who represented the Trinity Cemetery Corporation.

At the American Museum of Natural History, the same evening, Mr. D. G. Elliot, the well-known author of so many beautiful folio works on mammals and birds, pronounced an *eulogium* on Audubon, in which he gave an interesting account of his life and labours as a naturalist.

It was, he said, at the most beautiful season of the year, when all the groves were echoing with melody issuing from countless feathered throats, and the air was redolent with the perfume of the flowers, that on the 4th of May, 1780, in the then French province of Louisiana, on his father's plantation, John James Audubon was born. A few years after his birth, Mrs. Audubon accompanied her husband to San Domingo, and there perished during the insurrection of the negroes. The elder Audubon returned to France with his family, and the naturalist's son was sent to school, but young Audubon spent his time in the fields and woods collecting objects of natural history, and made about 200 drawings of birds. Declining to enter the army of General Napoleon, his father sent him to America to look after some property called Mill Grove, which he had near Philadelphia. Here he led an idle existence, and most of his time was occupied in hunting and fishing and drawing. In a description of himself written at this time he says:—"I had no vices, but was fond of shooting, fishing, and riding, and had a passion for raising all sorts of fowls, which source of interest and amusement occupied all of the time."

He would wander over little-known portions of the land, intent only upon the discovery of some new feature or the capture of some specimens already known but not yet added to his collection. In after years, looking back upon this happy period of his youth, he says, "Why could I not have kept to this delicious mode of living?"

One morning he entered the residence of his neighbour, Mr. Wm. Bakewell. He was shown into the drawing-room, where a young lady rose to welcome him. This was his introduction to Miss Lucy Bakewell, his future wife, who proved to be a most fitting mate to such a man as Audubon.

He was married in April, 1808. Later he entered into partnership with his brother-in-law under the firm-name of Audubon & Co., and after passing through many experiences and vicissitudes, on the 26th of April, 1826, he sailed from New Orleans to Liverpool, and reached his destination on the 20th of July. In Edinburgh he met Mr. Lizars, who offered to bring out the first part of the 'Birds of North America,' and on the 28th of November he was presented with proof of the first plate. He now issued his prospectus of the 'Birds of North America.' There being no text to his book, he began to prepare an ornithological biography, in which he was assisted by Mr. Wm. McGillivray. In three months the first part was finished and offered to some publishers, none of whom would give a shilling for it, and he issued it himself. In the autumn of 1839, the 'Birds of North America,' the most magnificent ornithological work the world has ever seen, with the ornithological biography, being finished, he came back to America.

In the spring of 1843 he started on his last expedition to visit the Yellowstone River to procure materials for his work, the 'Quadrupeds of North America.' Two years afterwards appeared the first volume of this great work. The other two were prepared mostly by his sons Victor and John, the last one appearing in the year Audubon died. In this hasty sketch of the naturalist's life I have touched upon some of the most important and interesting incidents of his career, exhibiting in various lights the impulsive, peculiar disposition of the man, which urged him often to enter upon impracticable and unwise undertakings, and yet never perverted him from the steadfast pursuit of his material. He was born to accomplish a certain task, and no matter what the condition of his life may have been, nothing could divert his mind from the subject in which his heart was wrapped, nor could any privation discourage him from following the study of his beloved birds. He was a woodsman, not a scientific naturalist, according to the idea prevalent to-day. As an artist and pupil of David we must judge him, and the master's influence is frequently seen in his plates.

As a naturalist, we must not judge Audubon by the standard of to-day, any more than we ourselves shall be measured by that employed by naturalists half a century hence. He was an ornithological artist, not a scientific naturalist, and no one

appreciated this fact, and was more ready to acknowledge it, than the simple, frank and enthusiastic author of the 'Birds of North America.' He never made pretence to be more than he really was. He never claimed to be anything higher than a lover of animals, but in this road he occupied the foremost place and has gathered imperishable fame. He was a painstaking observer, a field naturalist, who, daunted by no difficulties, penetrated the unknown forests, encountered with cheerful courage unknown perils, privation, hunger, cold, storms and heat, to procure specimens which afterwards were made to live again in the pages of his great work. He was the type of that class of naturalists whose labours produce the means by which his more scientific brothers are enabled to reach definite conclusions.

Audubon returned from his last expedition in October, 1843, and immediately began to work upon his 'Quadrupeds of America,' the first volume appearing two years later. He lived on his place now known as Audubon Park, at that time far removed from the bricks, dust, and grime of the great city, which he could never tolerate. The first volume of the 'Quadrupeds' was his last work. He retained his simple habits, passing much of his time in the woods, or at his easel, but he was verging towards three score and ten, and while he loved all his pursuits, was as eager as ever. The number of his accomplished years had tempered the ardour of his energetic spirit, and the fire of his youthful passions was gradually lapsing into a fitful glow. "My life," he wrote, "was peaceful and happy, surrounded by all the members of my dear family, enjoying the affection of numerous friends, and possessing sufficient share of all that contributes to make life agreeable, I lift my grateful eyes toward the Supreme Being, and feel that I am happy."

One day he discovered that he could not adjust his glasses so as to find a focus upon his canvas, and from that moment he began to fail. The devoted wife, who had always been his main stay throughout his checkered career, now never left him, read to him, and during his walks about the grounds, which stretched to the banks of the Hudson, was always at his side, but the once erect, lithe and agile figure was now lost in the feeble form of an aged man. Towards the last another shadow fell upon him; his mind failed, and his eye, noted for its brightness, became

dim; and during the remainder of his stay on earth, like a little child he was led by the hand.

On the 27th of January, 1851, the summons came, and as he lay upon his bed, surrounded by his family, his eyes regained their lustre, as though they penetrated the valley and looked beyond the river into the land which is ever far off, and with his hands clasped in those of his wife, he passed peacefully away. He sleeps by the side of a noble river, which, in its fair and full proportions, with stately sweep moves calmly onward to the great deep so near at hand, while above him, bearing upon its chiselled sides reproductions from his own drawings, rises the splendid monument now unveiled in honour of his memory and to commemorate his work.

NOTES AND QUERIES.

Professor Newton's 'Dictionary of Birds.'—The first part of Prof. Newton's 'Dictionary of Birds,' which has long been announced as in preparation, will be published in June. It is based upon the articles contributed by him to the ninth edition of the 'Encyclopædia Britannica,' but contains besides a large number of others by himself and Dr. Gadow, the Strickland Curator at Cambridge, together with contributions by Mr. Lydekker, Prof. Roy, and Dr. Schüfeldt. The work is to consist of four parts, and when complete will form a demy 8vo volume of about 1000 pages, copiously illustrated. The publishers, Messrs. Adam & Charles Black, promise Part II. in October next.

Protection of Sea-birds on the Farne Islands.—The naturalists who have formed an association for the purpose of protecting the sea-fowl which annually resort to breed on the Farne Islands, are to be congratulated on the success of their efforts. The following report has just been issued by the Hon. Secretary, Mr. H. A. Paynter, of Freeland, Alnwick, and it is satisfactory to note that long-banished species, like the Roseate Tern, are returning to their old nesting haunts, while others, like the Sandwich Tern, have considerably increased in number. Mr. Paynter writes as follows:—
 "The breeding season, 1892, although a cold one, turned out well, the Eider Ducks increased very much, and whereas a few years ago there were very few to be seen, last year there were many hundreds. I knew of seventy nests on the Inner Farne and Wideopens which hatched off. The Arctic Terns, although no young were reared in 1891, were as numerous as ever, and there were more than a thousand nests on the Knoxes and Wideopens.

On the 7th of June the Sandwich Terns' nests were counted, and there were found to be two hundred and forty nests. Two pairs of Roseate Terns nested, one on the Knoxes, the other on the Wideopens, and it is to be hoped they will increase. The Common Terns' eggs, which had been placed in the nests of the Arctic Terns, did not hatch, but with a more favourable season than last, it is intended to renew the experiment of trying to re-introduce them, as I understand in former years they bred commonly on the Islands. A large number of the eggs of the Lesser Black-backed Gull were taken in the beginning of the season and given away to the poor, and if possible I should like to drive them off the Inner Wideopens altogether, as they have plenty of other islands to breed on, where they would do less damage. They destroy great numbers of Eider Ducks' and Terns' eggs. Whenever an Eider Duck has been disturbed and left her nest uncovered, a gull is sure to swoop down and be off with an egg before the duck can return. The gulls never interfere with the eggs on the Knoxes, and if they can be prevented breeding on the Inner Wideopens, I do not think they will do much damage. Taking the eggs does not drive the gulls away, but turning the nests upside down seems to have that effect. Guillemots, Puffins, Kittiwakes, Oystercatchers, and Ring Dotterels were plentiful. No steamers with shooting parties visited the Islands, and I do not think many eggs were taken by the fishermen. The difficulty in watching the fishermen is very great, as they catch their crabs close to the Islands, and it is only by hearing the screams of the birds that the watchers can be certain anybody has landed, and by the time they have rowed perhaps half a mile to the spot, the fishermen are quietly hauling their crab-pots as if nothing had happened. At other times, when gathering mussels in the pools at low-water, a practice which I hardly like stopping, as bait is scarce and very expensive to buy, a few dozen eggs can easily be taken without the watcher's knowledge. On the whole, however, I think the fishermen behave very well, considering they were allowed for many years to take the eggs as they pleased. If the Bill now before Parliament to protect eggs is passed, it will very much decrease the expense of watching. The inhabitants of Northumberland are much indebted to the many kind ornithologists at a distance who subscribe for the preservation of birds which they cannot often have the opportunity of seeing."

MAMMALIA.

The Serotine Bat in Sussex.—On the 27th of April last, Mr. J. E. Hall, of Barrow Hill, Henfield, discovered a colony of this bat, *Vesperugo serotinus*, established behind the plaister under a small gable projecting from the wall of the Vicarage-house at Burpham, near Arundel. The entrance to their place of concealment being by an exceedingly small crevice, Mr. Hall tried for some time to make them quit this place by

thrusting in a piece of reed; but, finding that perfectly useless, he bethought himself of his pipe, and, by blowing in some tobacco-smoke, they were soon compelled to evacuate their stronghold; and on one protruding its head he seized it and drew it out, receiving a sharp bite which drew blood, and in the same manner obtained two more, and allowed fifteen others to escape in safety. The three he brought alive to me the next day. This is the first instance of the occurrence of this species, as a native of Sussex, I am aware of, though I had introduced it from the neighbourhood of Dover in 1851, and established it at Henfield (see Zool. 1874, p. 4126, and 1891, p. 203).—WM. BORRER (Cowfold, Sussex).

The crystalline lens in Vertebrates.—Dr. R. W. Shufeldt, writing in the New York journal 'Science' of April 28th, remarks:—"The crystalline lens in the eye of man consists of *three* triangular segments, and their existence is easily demonstrated by immersion of the lens in strong alcohol, or by boiling it. The apices of these three segments are at the centre of the lens, in *front*; their bases in the circumference. Another structural feature of the lens is seen in the laminæ of which it is composed. The treatment just proposed demonstrates these also, consisting, as they do, of concentric layers, which are firm at the centre, but become softer as we approach the peripheral ones. Likewise, by thus treating the crystalline lens from the eye of a horse, we prove that it also divides into its concentric laminæ, and its *three* triangular segments. But whether this holds true in the case of all vertebrates has not, I think, been demonstrated."

BIRDS.

Black Redstart at Flamborough Head.—It is not, I think, generally known how very frequent a visitor the Black Redstart, *Ruticilla titys* (Scop.), is at Flamborough Head in spring and autumn. In the former season it appears earlier and in the latter season later than the Common Redstart. Recently when at Flamborough I was shown by Mr. M. Bailey the skins of two adult males of *R. titys*, which had been caught in the spring of 1891, in which year they came "not single spies, but in battalions," first some on April 6th, and again a great rush on May 10th and 11th, scores of fine adult males being seen in hedges and gardens, and this over a very considerable district, Common Redstarts, Pied Flycatchers, and other small insect-eaters coming at the same time. I think it very probable, however, that only the males of *R. titys* would be recognised by local observers, the females being confounded with those of *R. phenicurus*. The northerly range of the Black Redstart apparently does not extend (except as an occasional visitor) north of the Baltic; so that it is probable our English visitors in the spring are such as have been

driven, by unfavourable meteorological conditions, much to westward of their normal line of flight, which is up the eastern side of the North Sea. It would be interesting to know in what direction the journey is continued from the headland—we may presume not northward or westward in Great Britain, or these birds must have been observed and recorded in other home localities. If, on the other hand, they proceed eastward, crossing into Holland and Schleswig, it must be by a route of which they can have had no previous knowledge or experience.—JOHN CORDEAUX (Eaton Hall, Retford).

Thrushes' Nests without mud lining.—On April 20th I found three nests of the Song Thrush, *Turdus musicus*, two of which contained four eggs, and the third three eggs. None of these nests had any trace of mud in them. One of them, which I have kept, is made entirely of grass, the lining of the inside being a little finer in texture than the outside. The inside of the nest is left in a very rough state, and the grass is not woven together at all neatly, but looks as though the birds had intended to line it in the usual way, but were not able to obtain any. No doubt the reason for this is the remarkably dry season. I might say that these nests were found on some downs, while others found near a river within a mile of the downs were formed in the usual manner.—H. F. WITHERBY (Blackheath).

The Tropic-bird, *Phaeton rubricauda*.—At a meeting of the Scottish Natural History Society, held in Edinburgh on May 5th, Surgeon-Captain H. H. Johnston, Army Medical Staff, read a paper on Mauritius, with special reference to the Natural History of Round Island, and exhibited specimens of all the plants found on the latter island by him in November, 1889. Large numbers of the Tropic-bird, *Phaeton rubricauda*, were observed on Round Island, and their eggs and young were found in the crevices of the rocks near the summit of the hill. Reference was made to a paper (Trans. Nat. Hist. Soc. Mauritius, 1842-45) by Colonel Floyd, who visited the island in 1842, and observed the interesting, but apparently previously unknown, manner in which the Tropic-bird used the two long slender tail-feathers as a rudder by which to steer in a storm.—J. B. DOBBIE (Edinburgh).

Wood Wren and Blackcap in Co. Wicklow.—On May 7th I had the pleasure of hearing the Wood Warbler, *Phylloscopus sibilatrix*, twice in some oak trees near the "Lover's Leap," at the Dargle, Co. Wicklow. I have never before heard this bird in Ireland so early as the first week of May. On the same day Blackcaps were in full song below the lovely Terrace Garden at Powerscourt.—H. CHICHESTER HART (9, Lower Hatch Street, Dublin).

Lapland Bunting in Yorkshire.—On May 11th, when with Mr. M. Bailey, of Flamborough, at the Bempton Cliffs, we saw an adult male

Lapland Bunting, *Plectrophanes lapponicus* (Linn.), in full summer dress, on the short herbage at the edge of the cliff. We both observed it for some little time through our glasses, about half-a-dozen yards away, till it flew down the cliff-face amongst a crowd of Guillemots and other rock birds, and did not after this show itself again. What particularly struck me when watching this bird was the intense black of the dark parts as contrasted with the yellow bill, broad white streak over and backward from the eye, and chestnut collar.—J. CORDEAUX (Eaton Hall, Retford).

Snowy Owl on Exmoor.—I was staying, during the first week of May, on Exmoor, and, in course of conversation with the keeper, found that a Snowy Owl, *Nyctea scandiaca*, had been killed on what is called the North Forest some fourteen years ago. The bird was caught in a trap set for hawks, was preserved, and is in the possession of Sir Frederick Knight, who very kindly allowed me to see it. I was unfortunately unable to see him, and could not get the exact date. There was no appearance of its having been in captivity; the claws were in good condition and very perfect, though it is of course possible that they may have been sharpened and cleaned by the person who preserved it. I think the only other occurrence noted of this owl in Somerset, was one killed near here, which was proved to be an escaped bird. Sir F. Knight has also a Pelican found on the moor, in an exhausted state, some four years ago; this, however, was no doubt an escaped bird.—H. St. B. GOLDSMITH (King's Square, Bridgewater).

[The Owl here referred to, we presume, is that which was recorded some years ago by the Rev. M. A. Mathew (Zool. 1876, p. 4900), and is noticed again in Messrs. D'Urban and Mathew's 'Birds of Devon,' 1892, p. 135. It was trapped on Dartmoor in March, 1876.—ED.]

Garganey in Sussex.—Besides the specimen recorded by Mr. Parkin (p. 193), another, I regret to say, was shot at South Common, near Box Hill, about March 29th, in spite of its being the close time.—G. W. BRADSHAW (Hastings).

White Wagtail in Co. Mayo.—On the 29th of April, when on the island of Bartragh, Killala Bay, with Mr. H. Scroope and his brother, we observed a Wagtail having such a large patch of white on the sides of the throat that it attracted our attention, and on a nearer approach the light grey back showed it to be the White Wagtail, *Motacilla alba*. It flew off and joined another some yards distant, and having my gun I secured it. It proved to be an adult male in perfect plumage. It was a singular coincidence that, about 300 yards from where I found these birds, I shot the first recorded Irish specimen of this species on the 25th April, 1851. Probably a flight of these birds arrived on our coast, for Mr. Williams informed me that he received one from Achill, sent by Mrs. Sheridan;

and Mr. Scroope, who visited Downpatrick Head a few days after he was with me at Bartragh, saw another near the ruins on the head.—ROBERT WARREN (Moyview, Ballina).

Scandinavian Rock Pipit on the East Coast of England.—Mr. Caton Haigh has recently drawn my attention to the striking difference of plumage between examples of the Rock Pipit from the coast of Wales, compared with those from the Lincolnshire shore, shot in October, at which season they are often abundant with us, the east-coast birds being much more warmly coloured underneath with a rich buff or cinnamon breast. Since this, an examination of numerous skins in three local collections from the Holderness and Lincolnshire coasts points to the conclusion that the migratory Rock Pipits which visit us in autumn are almost exclusively the Scandinavian form of this species, *Anthus rupestris* of Nilsson.—JOHN CORDEAUX (Eaton Hall, Retford).

Black Tern in Cheshire.—A bird of this species, *Hydrochelidon nigra*, in mature summer plumage, was shot at Oakmere on April 22nd, and fell into the hands of T. Hutchinson, taxidermist, who gave me an opportunity of examining the fresh skin. Two birds were said to have been shot, but one only was procured. The body was examined by Mr. Newstead, Curator of the Grosvenor Museum, Chester, who found it to be a male, and reported that the stomach contained chiefly Diptera (a large species), also two wing-cases of a bright green Chrysomelid beetle, and one specimen of *Aphodius punctato-sulcata*.—W. HENRY DOBIE (Chester).

Bulbul feeding Blue-birds in Captivity.—In one of my smaller indoor aviaries I have a pair of Blue-birds, *Sialia sialis*, and a Red-vented Bulbul, *Pycnonotus hæmorrhous*, and when the Blue-birds go to nest, as they do each spring, the Bulbul has a hard time of it. This spring, however, the latter bird showed signs of mating with the hen Blue-bird. He sidled up to her, warbling and whining, but she treated him with contempt, and, when he came too close, made a rush at him which caused him to elevate his crest and depart. Early last March the Blue-birds went to nest, the hen laying four eggs of about the size of those of the Wheatear, but a little bluer in tint. On the 27th the first nestling was hatched, and whilst the mother was down below breaking up a mealworm to feed it with, the Bulbul watched his opportunity, snatched the worm away, and, after further crushing it, flew straight into the nest-box and gave it to the young bird. The fright of the two parents was somewhat ludicrous to witness; they evidently thought, as I did, that the young one would be killed. On the 28th a second bird was hatched, and the Bulbul, growing bolder, entered the nest-box while the mother was sitting there and fed the young. He would take all the mealworms he could find to

them, and seemed astonished that a newly-hatched squab could not swallow a whole mealworm at a mouthful. For he was in such a hurry that he did not half break up the food before offering it, but had to come outside and knock it about two or three times before it was tender enough to be swallowed. The hen Blue-bird, after breaking up a mealworm, swallows and disgorges it before presenting it to her young.—A. G. BUTLER (124, Beckenham Road, Kent).

Hoopoe in Sussex.—Mrs. Seward Dunlop reports to me that a fine Hoopoe was on her lawn, Red Oaks, Henfield, Sussex, on Easter Day, and then disappeared ominously. These Sussex birds are ecclesiastical. In 1869 a Hoopoe was at Bosham Vicarage on Good Friday.—H. D. GORDON (The Vicarage, Harting, Sussex).

Notes on the American Bittern.—Late last September a female *Botaurus lentiginosus* was discovered by some boys upon the margin of a small pond at a short distance behind my residence. It was a most unusual locality for the species to occur, and its coming there appeared to have been due to the fact that the bird was exhausted by long flight. After flying a few yards it was easily captured, and was brought to me alive, without having received any bodily harm whatever. Next morning it had recovered no little of its strength, and it was remarkable to observe how noiselessly and with what ease it could fly about a furnished room without overturning any small object of furniture. It gracefully flew up from the floor and perched upon the curtain-rod of a high window, where it sat for an hour or more in a characteristic position, as motionless as a statue. If approached when upon the ground, it eyed you keenly, assumed a squatting posture, widely spread out the feathers at either side of the neck, while it slightly raised those of the rest of the body and its wings; and finally, when it considered you within the proper distance, drew all its plumage close to its body and delivered, as quickly as a flash, a darting blow with its beak. This thrust, I am sure, is generally given with sufficient violence to pierce one through an eye, even were the lid instinctively drawn down to protect that organ. By such a blow it can easily stab a large frog through and through its head, impaling the creature upon the end of its beak—a feat I have seen the bird perform. A loud blowing noise accompanies this attack of the Bittern, which varies in its intensity—depending apparently much upon the degree of anger to which the bird has been excited by its tormentors. My captive behaved much in the same way when held up by the legs in front of another person, and one had to exercise great care to avoid its quick and well-delivered thrusts. At the end of three or four days, it having eaten nothing up to that time, nor drunk any water, I offered it a live medium-sized frog to try its appetite. It promptly laid out that poor batrachian by a few telling stabs given with its beak, sending one home every time the

animal moved a limb. Immediately after killing it, it was picked up with the bill, and, throwing back its head, the bird attempted to swallow the morsel. In this it failed after several trials, and finally abandoned it for good and all. This Bittern lived twelve days without ever having eaten a single thing or swallowed a drop of water. It passed several thin, cream-coloured evacuations from the bowels every twenty-four hours, and died, apparently without any pain, in a squatting position, absolutely unruffled in plumage, on the evening of the twelfth day—a plucky fowl to the instant of its death. There is one very interesting point to observe here, and it is the fact that the lower the position a bird occupies in the system the greater the length of time it seems to be enabled to go without partaking of any nutriment whatever. Gannets and Cormorants will live nearly a month without eating or drinking anything, while, on the other hand, any of the small Passeres will succumb in a few days to such treatment. In this connection it is important to note that many lizards will live several months without consuming either a morsel of food or a drop of water. This may be another particular in which the lower birds approach their reptilian kin. While dissecting this Bittern with the view of saving its skeleton and observing what else I could in its anatomy, I found that it possessed a peculiar arrangement and modification of the vertebræ and certain muscles in the upper third of the neck, much as we find it in *Plotus anhinga*, and, in a less marked degree, in Cormorants, Gannets, and Pelicans. This modification, which is associated with the power of the birds mentioned (especially the Darters and Bitterns) of giving a quick thrust with the beak, has been well described by Garrod in a paper among his ‘Collected Scientific Memoirs,’ and by Donitz, and is well worthy of close study and comparison. Garrod does not mention having observed it in *Botaurus* and its allies.—
R. W. SHUFELDT (Takoma, D.C.).

Mongrel Ducks in the London Parks.—I have been asked to call attention to this subject by such means as may be in my power. I do so very gladly, because I feel sure that it has the sympathy of the ornithological readers of your paper. The collection of waterfowl in London is a source of unflinching interest, both for those who live there and for those who come up from the country. Without taking up your space with instances, I may say that the periods and casual coming and going of birds, the nesting and rearing of young on the part of species usually in this respect the most capricious, the extremely interesting hybrids that result from cross-pairing, give the London waterfowl a claim to attention that is, perhaps, almost unique. Only those, possibly, who have themselves kept “ornamental waterfowl” can fully appreciate all that the above implies. But a hybrid is one thing; a mongrel is quite another. And nothing could more greatly tend to hinder the full possibilities of this real scientific opportunity, or to spoil the general result even as a show, than the presence of the horrible

parti-coloured mongrel ducks that are now seen in the parks. May we not venture, then, to hope that the authorities of the Crown and the London County Council will turn their attention to this question, and by concerted action wipe out the mongrels without delay. If they will do this, they may rest assured that they will have earned the thanks of the very many who have watched with great appreciation their efforts to make the parks more useful and attractive.—AUBYN TREVOR-BATTYE.

[All ornithologists must agree with the suggestions of our correspondent. The parti-coloured mongrels, arising from the interbreeding of black, white, and brown varieties of the domestic duck, have neither beauty nor utility to recommend them. They should be cleared away without scruple to give room for the numerous distinct species which will breed truly, or, if hybridising, will give rise to such interesting products as the Bimaculated Duck—a hybrid between the Teal and the Wigeon—and others equal in beauty, some of which are fertile.—ED.]

The Wax-like Tips in the Feathers of Ampelis.—I have made the ultimate anatomical structure of feathers a special study for many years during which I have given those of the period before the first moulting special consideration, and have met with some extremely interesting things. I have never been so fortunate as to meet with a wax tip while the young bird was still in the nest, but have occasionally seen them in very fresh subjects, or as early as the 25th of July. The development of the appendage, after it has commenced to appear, is very rapid indeed, resembling the process of the growth of the new antlers of a buck. I cannot yet state definitely the length of time, but from three to five days ordinarily, and doubtless sometimes a little more. In a work devoted to the birds of Minnesota, I have made some references to my familiarity with the species, to which I might add many more notes, since that went out of my hands, that are even more in point; but suffice to say, the red wax is secreted in the ciliohamular portion of the barbules of the terminal barbs of the feather. The rapidity of the development of the appendage is such that occasionally it results in doubling the whole series of barbs, with their barbules, back upon the rachis of the feather, and reveals the fact that the horny material constituting the wax-like mass is filled from the tip, shaftward, as if in fact, as in appearance, it consists of genuine red sealing-wax, which has become so thickened or condensed as to cease flowing before quite reaching the point of union of the barb with the delicate, overlaid rachis. The naked portions of those barbs becomes an easy object of observation under low powers of the microscope, and under supremely good light and a higher magnification the reflected portions of the barb with its barbules, and even the barbicels, may be seen resting upon the unreflected portion of the barbs and rachis. That there is some special condition, very temporarily involved, that produces

these decorations there can be no doubt. I have never yet succeeded in seeing a wax tip on a Waxwing reared in captivity, excellent as has been my opportunity.—P. L. HATCH (in 'Science,' New York).

Nesting of the Short-eared Owl in North Devon.—I found this spring, near Brauntou, in North Devon, the nest of the Short-eared Owl (*Otus brachyotus*), in which were three young birds and one unfertile egg. It was on a swampy piece of ground in the middle of a bramble, and was a mere depression in the soil. At different times we put both the male and female owl off the young. On the second occasion on which we visited the nest, the elder of the young birds had gone. The old birds flew round us, circling in the air and uttering a harsh cry resembling the syllables "Che-ough."—F. H. CARRUTHERS GOULD (Buckhurst Hill, Essex).

SCIENTIFIC SOCIETIES.

LINNEAN SOCIETY OF LONDON.

May 4, 1893.—Professor STEWART, President, in the chair.

Messrs. H. B. Bottomley, John Percival, and R. S. Standen were admitted, and the following were elected Fellows:—John Buchanan, C. H. Nicholls; and, as Foreign Members, Prof. C. Claus and M. Casimir de Candolle.

Dr. R. B. Sharpe exhibited some new and rare birds from Borneo, and made remarks upon the singular distribution of the genera to which they belonged. On behalf of Miss E. M. Sharpe, he also exhibited the sexes, larvæ, and cocoons of a rare silk-worm moth, *Gonometa fascia*, from Lagos.

Prof. J. B. Farmer exhibited under the microscope some preparations showing attraction spheres in Hepatic spores, and gave the result of his recent researches on the subject.

Mr. Thomas Christy exhibited some curious variations in foliage in plants of *Sterculia* from Brazil, reared from the same pod, and showed also a specimen of *Erythroxylon coca* in fruit.

Mr. W. B. Hemsley showed two British plants, which were interesting on account of the localities, namely, *Empetrum nigrum* from Dorset, where Mr. C. Clarke had seen it growing on Poole Harbour Spit, although it had not been included hitherto in the county flora; and *Scilla nutans* with prolonged bracts, usually regarded as an introduced garden form which had been found growing apparently wild in a wood near Ashford, Kent.

Mr. Alfred Sanders then read a paper on the nervous system of *Myxine glutinosa*, a fish allied to the Lampreys.

May 24. *Anniversary Meeting.* — Prof. STEWART, President, in the chair.

The Rev. W. Johnson and Dr. Theodore Cooke were admitted Fellows of the Society.

The Treasurer presented his Annual Report duly audited, and the Secretary having announced the elections and deaths during the past twelve months, the usual ballot took place for new Members of Council, when the following were elected:—Messrs. J. G. Baker, A. C. Günther, G. R. Murray, R. C. A. Prior, and Howard Saunders. The President and officers were re-elected.

The Librarian's Report having been read, and certain formal business disposed of, the President delivered his Annual Address, taking for his subject "The various modes in which animal sounds are produced." On the motion of Dr. Braithwaite, seconded by Sir James Gibson Maitland, Bart., a unanimous vote of thanks was accorded to the President for his able Address, with a request that he would allow it to be printed.

The Society's Gold Medal was then formally presented to Prof. Daniel Oliver, in recognition of the service rendered by him to Botanical Science by numerous valuable publications. A characteristic reply having been made by Prof. Oliver, the proceedings terminated.

ZOOLOGICAL SOCIETY OF LONDON.

May 2, 1893.—Sir W. H. FLOWER, K.C.B., LL.D., F.R.S., President, in the chair.

The Secretary read a report on the additions that had been made to the Society's Menagerie during the month of April; and called special attention to a young male Orang, *Simia satyrus*, brought home from Singapore, and presented by Mr. Thomas Workman; a White-bellied Hedgehog, *Erinaceus albiventer*, from Somaliland, presented by Mr. H. W. Seton-Kerr; and a female Gibbon, *Hylobates muelleri*, brought home from North Borneo, and presented by Mr. Leicester P. Beaufort.

The Secretary laid on the table a list of the exact dates of the issue of the sheets of the Society's 'Proceedings' from 1831 to 1859, concerning which information had lately been applied for. He made some remarks on the occasional protrusion of the cloaca in the Vasa Parrot at certain seasons. He also read some notes on the Monkeys of the genus *Cercopithecus*, and called attention to *C. boutourlinii*, Giglioli, from Kaffa, Abyssinia, of which he had lately examined specimens in the Zoological Museum of Florence, and which he considered to be a perfectly valid species.

Mr. M. F. Woodward read a paper (the first of a series) entitled "Contributions to the Study of Mammalian Dentition." In the present communication he treated of the dentition of the *Macropodidae*, and described the presence of a number of vestigial incisors. He also showed that the

tooth generally regarded as the successor to the fourth premolar was, in reality, a distinct tooth, and that the molars in this family of Marsupials belonged to the second dentition.

Mr. W. T. Blanford read a description of two heads of a Stag from Central Tibet, belonging to the Elaphine group, on which he proposed to found a new species, *Cervus thoroldi*. These specimens had been obtained by Dr. W. G. Thorold about 200 miles north-east of Lhasa, at an elevation of 13,500 feet above the sea-level, during his late adventurous journey through Tibet in company with Capt. Bauer.

May 16.—OSBERT SALVIN, Esq., F.R.S., Vice-President, in the chair.

Extracts were read from a letter addressed to Prof. Newton by Prof. E. C. Stirling, of Adelaide, respecting the recent discovery of a large series of remains of *Diprotodon*, *Phascolomys*, and other Mammals at Lake Mulligan, in South Australia, about 600 miles north of Adelaide. It was anticipated that when these remains were received and examined, very important additions to our knowledge of the extinct Mammal-fauna of Australia would follow.

Mr. Beddard read a paper upon the structures termed "atrium" and "prostate" in the Oligochæτους worms, in which reasons were given for believing that all these structures were reducible to one common plan.

Mr. G. B. Sowerby read the descriptions of fifteen new species of shells of the family *Pleurotomidæ* from different localities.

A communication was read from Mr. A. H. Everett, containing a revised list of the Mammals inhabiting the Bornean group of islands, that is, Borneo and Palawan, which, as Mr. Everett had shown in a previous paper, belongs zoologically to Borneo.

Mr. O. Thomas read a paper containing an account of a second collection of Mammals sent by Mr. H. H. Johnston from Nyasaland. The present series (collected, like the former, by Mr. Alexander Whyte) consisted of about seventy-five specimens, referable to thirty species, of which a large proportion were additional to the Fauna of Nyasaland.

Dr. P. Sonsino, of Pisa, read some notes on specimens of parasitic worms of the genus *Distomum*, of which he had lately examined specimens.

—P. L. SCLATER, *Secretary*.

ENTOMOLOGICAL SOCIETY OF LONDON.

May 10, 1893.—HENRY JOHN ELWES, Esq., F.L.S., F.Z.S., President, in the chair.

Mr. A. Cowper Field, of 81, Wiltshire Road, Brixton, S.W., was elected a Fellow of the Society.

Mr. R. McLachlan exhibited, for Dr. Fritz Müller, of Blumenau, Santa Catarina, Brazil, specimens of larvæ and pupæ of a dipterous insect,

Paltostoma torrentium, and read a letter from Dr. Fritz Müller on the subject. The writer stated that these larvæ were of the same nature as those exhibited by Mr. Gahan, at a meeting of the Society in October, 1890, and which were then thought by Lord Walsingham and Mr. McLachlan, to be allied to the Myriapoda. Mr. Gahan, Mr. Jenner Weir, Colonel Swinhoe, Mr. Blandford, Mr. Verrall, Mr. Slater, and Mr. Jacoby took part in the discussion which ensued (*cf.* Proc. Ent. Soc. 1891, p. ii.).

Mr. S. G. C. Russell exhibited *Hesperia alveolus*, variety *Taras*, taken by him at Woking in April last.

Mr. J. M. Adye exhibited a long series of *Moma orion*, *Eurymene dolobraria*, *Amphidasis betularia*, and *Chloephora prasinana*, and a few specimens of *Notodonta dodonea*, *N. chaonia*, and *N. trepida*, *Acronycta alni*, and *Selenia illustraria*, all bred by him in March and April last, from larvæ obtained in the autumn of 1892 in the New Forest.

Mr. H. Goss read a copy of a letter received by the Marquess of Ripon, at the Colonial Office, from the Governor of the Gold Coast, reporting the occurrence of vast swarms of locusts at Aburi and Accra, West Africa, about the middle of February last. The writer stated that at Accra the swarm extended from east to west as far as the eye could see, and appeared to occupy a space about two miles wide.

Colonel Swinhoe stated that some years ago he had been requested by the Indian Government to report on plagues of locusts. He said he had witnessed swarms of these insects far larger than the one just reported from the Gold Coast, and mentioned that many years ago, when going up the Red Sea in one of the old P. and O. paddle-boats, the boat had frequently to stop to clear her paddle-wheels from locusts, which had settled in such swarms as to choke the wheels and stop their action.

Mr. C. G. Barrett called attention to a field excursion to the Cotswolds which it was proposed to have in June. Fellows of the Society were requested by the President to communicate to Mr. Barrett, as early as possible, their views as to the date which would be most generally convenient for such excursion, and to offer any other suggestions on the subject which might occur to them.

Mr. E. C. Reed, of Valparaiso, Chili, communicated a paper entitled "Notes on *Acridium paranense*, the migratory locust of the Argentine Republic." Colonel Swinhoe, Mr. Champion, Mr. Elwes, Mr. McLachlan, and Mr. Merrifield took part in the discussion which ensued.

Professor L. C. Miall communicated a paper entitled "Dicranota; a Carnivorous Tipulid Larva."

Dr. T. A. Chapman communicated a paper entitled "On a Lepidopterous pupa (*Micropteryx purpurella*) with functionally active mandibles." Mr. McLachlan said Dr. Chapman's observations were of great value, and tended to show that the position of *Micropteryx* was still nearer the Trichoptera than had been supposed.

The President announced that the new Library Catalogue, which had been edited by Mr. Champion, with the assistance of Mr. McLachlan and Dr. Sharp, was now ready for sale to the public at 9s., and to the Fellows of the Society at 6s. a copy.—H. Goss, *Hon. Secretary.*

NOTICES OF NEW BOOKS.

Animal Coloration: an account of the principal facts and theories relating to the Colours and Markings of Animals. By F. E. BEDDARD, M.A., Prosector to the Zoological Society of London. 8vo, pp. 288. With four coloured plates, and woodcuts. London: Swan Sonnenschein & Co.

MR. POULTON'S volume on this subject in the 'International Scientific Series,' and Dr. Wallace's sketch of animal coloration in his work on 'Darwinism,' deal with the matter almost entirely from the point of view of natural selection. In the book now before us Mr. Beddard has, as he puts it, "attempted to lay some stress upon other aspects of the question." He has borrowed fewer illustrations from insects than his predecessors, although, as he says, it is impossible not to devote a good deal of space to insects, when we consider, for example, that the theory of mimicry is almost entirely supported by evidence furnished from that group.

Mr. Beddard's aim, however, has been to give the reader a general notion of the facts and theories relating to Animal Coloration; and although the result must be regarded rather as a useful compilation than as an original treatise, its character is of an extremely varied and interesting nature.

It is important, of course, at starting, to distinguish between "colour" and "coloration," that is to say, between the actual tints, and their arrangement and distribution. It is no doubt the fact, as stated by Dr. Wallace, that "colour is a normal product of organisation," entirely independent of utility; on the other hand, as Mr. Beddard points out, there is a good deal of evidence to show that "coloration bears often a distinct relation to the needs of the animal"; from which he infers that it may therefore have been modified by natural selection.

Coloration, however, is not always in harmony with the mode of life of the animal; not only are there colours and coloration

which are of no ascertained use, but occasionally the general plan of coloration apparently endangers the species displaying it.

To follow Mr. Beddard through the many interesting problems which are discussed in his book would occupy more space than we have at our disposal. It must suffice if we indicate the scope of his work. After an introductory chapter, in which he argues that the action of natural selection must be strictly limited, and points out that the same plan of coloration is found in distantly related animals, explaining the relation between coloration and structure, he proceeds to discuss coloration as affected by environment, protective coloration, warning coloration, protective mimicry, and sexual coloration. All these subjects are fully considered, together with the views of the recent specialists who have written upon them. In particular he refers to the ingenious theories of Dr. Eisig on warning colours, and Herr Stolzmann on sexual dimorphism, giving the pith of their opinions in a way calculated to save much trouble to those readers who may have no opportunity of referring to the originals. Indeed, considering the enormous extent of the literature of the subject, Mr. Beddard has done good service in reducing to something less than 300 octavo pages an account of the principal phenomena of animal coloration. We have perused his book with considerable interest, and can cordially recommend it to our readers.

Idle Days in Patagonia. By W. H. HUDSON, Author of 'The Naturalist in La Plata.' 8vo, pp. 256. With illustrations. London: Chapman & Hall.

ALTHOUGH not so attractive a volume as 'The Naturalist in La Plata,' which was not long since noticed in this Journal (Zool. 1892, p. 373), Mr. Hudson's new book has much to recommend it. His chapter on the plains of Patagonia is an amplification of and a commentary upon the description given by Darwin (in his 'Voyage of the Beagle'), upon whom these vast treeless wastes made so great an impression, and his account of the characteristic mammals and birds by which they are tenanted conjures up a vivid picture of wild life in South America. There is an excellent chapter upon "Sight in Savages," one of the most interesting in the book, and another "Concerning Eyes," in which

a graphic description is given, with an illustration, of the splendid orange eyes possessed by the Magellanic Eagle Owl, and the way in which they flash when the bird is excited. "Bird Music in South America" is the title of a chapter in which the writer descants upon the difficulty of representing such sounds upon paper, and conveys his impressions of some of the more remarkable South American songsters which he has met with in the course of his wanderings:—

"If the birds of this region," he says, "do not excel those of other lands in sweetness, compass and variety, for constancy in singing they indubitably carry the palm. In spring and early summer their notes are incessant; and the choir is then led by that incomparable melodist, the White-banded Mocking-bird, a summer visitor. Even in the coldest months of winter (June and July), when the sun shines, the hoarse crooning of the Spotted Columba, resembling that of the Wood Pigeon of Europe, and the softer and more sigh-like lamentations of *Zenaida maculata*, so replete with wild pathos, are heard from the leafless willows fringing the river. Meanwhile, in the bosky uplands, one hears the songs of many passerine species; and always amongst them, with lively, hurried notes, the Black-headed Magellanic Siskin. The Scarlet-breasted or Military Starling sings on the coldest days and during the most boisterous weather; nor can the rainiest sky cheat the Grey Finches, *Diuca minor*, of their morning and evening hymns, sung by many individuals in joyous concert. The common Mocking-bird is still more indefatigable, and sheltering himself from the cold blast, continues till after dark warbling out snatches of song from his inexhaustible repertory; his own music being apparently necessary as food and air to his existence."

If it were not so far to reach, Patagonia, as a health resort, must be a country wherein a man may prolong his life far beyond what is possible in our treacherous climate. The atmosphere there is at all times so dry and pure as to make pulmonary complaints unknown. An acquaintance of the author told him that from boyhood he had suffered from weak lungs and asthma; in search of health he had left his native country (Spain) and settled in Buenos Ayres. But his old enemy found him there; his asthma became worse and worse, and at last, on his doctor's recommendation, he went on a visit to Patagonia, where in a short time he was restored to complete health, such health as he had never previously known. He went back rejoicing to Buenos Ayres, only to fall ill again, and to find his life growing a burden to him. Finally, in desperation, he sold his business and went back to the

only country where existence was possible. "When I knew him," adds Mr. Hudson, "he had been permanently settled there for about fourteen years, during which time he had enjoyed the most perfect health."

As for the wild sport to be obtained there, in hunting, shooting, and fishing, the reader has only to consult Mr. Hudson's book to find that in this respect also it is a country with attractions.

Short Stalks; or Hunting Camps, North, South, East, and West.

By EDWARD NORTH BUXTON. Fcap. 4to, pp. 400. With numerous illustrations. London: Edward Stanford.

THE sportsman who delights in "stalking" stands on a different footing to the ordinary hunter of big game. He can never be accused of slaughter, and often derives as much keen enjoyment from an unsuccessful stalk as if he had secured the object of his ambition. The fact is that his pursuit of necessity takes him into some of the wildest and most beautiful of mountain scenery amidst which it is a privilege to roam, and where to pause and admire seems like the realization of a dream. To be out at early morning, listening to the gradual awakening of animal life around, hearing how the very earth shakes off its deep slumber, and at last to see "masses of forms emerge from the gloom," is one of the most enjoyable incidents which form the sum of a hunter's life. In this intense appreciation of Nature in her grandest aspects he is tempted sometimes to forget that he is armed, and only becomes aware of the proximity of game when too late to avail himself of the chance of securing it. The life of a hunter under such conditions is much to be envied, for none can enjoy better opportunities than he does of studying Nature in the most fascinating manner.

Mr. Buxton is a veritable disciple of Charles Boner, and combines the qualities of an ardent sportsman with those of an observant naturalist. Those who have read and appreciated Boner's little book on 'Forest Creatures,' and his 'Chamois Hunting in the Mountains of Bavaria,' may know the sort of book to expect, and will cordially welcome this new volume by a kindred spirit.

In one respect it may be said Mr. Buxton's work is even

more attractive, since it deals with a greater variety of game, and carries the reader into a greater diversity of country. Besides the Chamois, in whose pursuit Boner found such fascination, we are introduced to the Mouflon of Sardinia, the Wapiti and Bighorn of the Rocky Mountains, the Wild Sheep of Barbary, the Wild Goat of Asia Minor, and the Pyrenean Ibex. We learn how to follow the Elk in Sweden, the Reindeer in Norway, and the Red-deer on the great island of Hitteren. Furthermore, we are initiated into the more dangerous sport of Bear-hunting. Truly a varied and exciting programme !

In regard to some of these animals, of course, there is not much to be said that is very new. Their haunts have been described by many previous writers, and the excitement which attends the pursuit of them has been dwelt upon again and again. Still there is often a great deal of charm in an old story newly told, and when, as in the present instance, the writer abstains from compilation, and confines himself to a narration of his own experience, the value of his observations is considerably enhanced. Particularly is this the case when he is unselfish enough to indicate his *route*, and give useful hints to those who may care to follow him.

It is not easy to make an extract where there is so much that suggests quotation, but the following, taken from the chapter on the Pyrenean Ibex, will convey an idea of the writer's style, as well as of his powers of observation and description :—

“I cannot say I am enamoured of Ibex driving, and if it were not for the rarity of the trophy, I would never have endured those tortures. Fancy sitting through three sermons on end, of the longest kind, on a stone which gets harder and sharper every minute, under the strictest obligation not to move, or go to sleep. If on the shady side of the valley, there is a rasping wind, and probably a snowstorm. On the northern slope *frying* understates the case. The solitude and the strange positions in which you find yourself have a strong effect on the imagination. The faintest sound acquires an exaggerated significance, and sets the heart throbbing painfully. I have often fancied I heard shots which were never fired, and the baying of dogs which proceeded from no canine throats. The one hallucination may have been suggested by a little pebble hopping down from the cliff above, or the rumbling of stones in the torrent below, the sound of which comes up to you at intervals, now faint and now strong, then for a long period altogether inaudible. The baying of the dogs is what you are listening for, so the illusion is natural ; but the real thing is

unmistakeable, and, if you hear it, pull yourself together, for a deer-coloured body may spring across the *couloir* which you are commanding, either above or below you, and won't wait till your hand stops trembling. Much more frequently nothing happens at all, and the tension of your heart-strings is finally put an end to by a sudden and unexpected yell from a beater, which nearly cracks them outright. He appears round a corner of rock and looks round in a bewildered way, for though he knows you are there, he cannot see you till you rise stiffly and stretch the aching joints, with a sense of relief that that penance is over at any rate.

“Some interest is afforded by the birds and lesser animals. Flights of thrushes coming from the direction of the drive afford the first indication of the approach of the beaters, though these are still inaudible. As you are stationary, and nearly the colour of the rock, the live things do not see you, and consequently come very close. A squirrel pattering over loose stones is a good imitation of the sound made by the larger animal which you are expecting. They are mostly coal-black, with a slight tinge of grey on the tail—a very pretty species. When at last they discover the enemy, they chatter angrily. Dusky jays express their views on things in general in the same way as their blue-winged cousins do with us. The little Wall-creeper is one of the prettiest birds;—black and grey, with brilliant crimson wings, and beak curved like a Curlew's. He flutters about the hot rocks—a close imitation of a butterfly,—and this resemblance is enhanced by his habit of spreading his wings in the sun when he alights. Eagles are numerous, and the great Lammergeier is not rare. I have known as many as five of the former to come down to the body of an Izzard, which had been too much smashed by falling over the cliff to be removed, and commence a furious contest before we had left it for five minutes. There are a few Foxes about, and occasionally I have seen Pine Martens. One of these animals came and sat within thirty yards of me. As the drive was nearly over, I put a bullet through him, and he makes a very handsome mount in my hall.”

We cannot close this volume without bestowing a word of praise on the illustrations, which are excellent. The author has been fortunate in securing the aid of Mr. Joseph Wolf, than whom no better animal painter is to be found, and his characteristic drawings of the various kinds of wild sheep and wild goats, which delight the “stalker” and the naturalist, leave nothing to be desired.

THE ZOOLOGIST.

THIRD SERIES.

VOL. XVII.]

JULY, 1893.

[No. 199.]

A CATALOGUE OF LOCAL LISTS OF BRITISH MAMMALS,
REPTILES, & FISHES, ARRANGED UNDER COUNTIES.

By MILLER CHRISTY, F.L.S.

(Continued from p. 216.)

REPTILES.

ENGLAND AND WALES.

BEDFORDSHIRE.

DAVIS, FREDERICK.—Reptiles, &c., of the Neighbourhood [of Luton]. In his *History of Luton*, pp. 198-199. Luton, dy. 8vo, 1855. (Enumerates 8 species only.)

MILLER, S. H., & S. B. J. SKERTCHLY.—[The Reptiles of the Fenland.] In their *Fenland, Past & Present*, pp. 388-390. Wisbeach & London, roy. 8vo, 1878. (A good list; enumerates 10 species.)

CAMBRIDGESHIRE.

MILLER, S. H., & S. B. J. SKERTCHLY.—[The Reptiles of the Fenland.] In their *Fenland, Past & Present*, pp. 388-390. Wisbeach & London, roy. 8vo, 1878. (A good list; enumerates 10 species.)

JENYNS [now BLOMEFIELD], Rev. LEONARD.—A List of Reptiles found in Cambridgeshire. In *Trans. Cambridge Philos. Soc.*, vol. iii, pp. 377-381. Cambridge, dy. 4to, 1830. (A valuable list; enumerates 10 species.)

CARNARVONSHIRE.

INCHBALD, PETER.—[The Reptiles of Llandudno & District.] In Williams's *Complete Guide to Llandudno* [&c.], pp. 241-242. Llandudno, 8vo, 1860. (Enumerates 13 species.)

CHESHIRE.

LEIGH, CHAS.—[The Reptiles of Cheshire.] In his *Natural History of Lancashire, Cheshire, & the Peak in Derbyshire*, pp. 147-157. Oxford, fcap. fol., 1700. (An unsatisfactory list, in which insects are included.)

CORNWALL.

BORLASE, REV. WM., F.R.S.—[The Reptiles of Cornwall.] In his *Natural History of Cornwall*, pp. 282-285. Oxford, fcap. fo., 1785. (Enumerates six species, including the Seal!)

[Anon.]—[The Reptiles of Cornwall.] *Monthly Magazine*, vol. xxvi, p. 528. London, dy. 8vo, 1808. (Enumerates 10 species.)

COUCH, JONATHAN.—The Reptiles [of Cornwall.] In his *Cornish Fauna; being a Compendium of the Natural History of the County*, pp. 30-31. Truro, dy. 8vo, 1838. (Enumerates 11 species; for 2nd ed., see under Thomas Cornish, Truro, dy. 8vo, 1877.)

COCKS, W. P.—[The Reptiles of the Falmouth District.] *Naturalist* (Morris's), vol. ii, p. 16. London, roy. 8vo, 1851.

BULLMORE, W. K., M.D.—[The Reptiles of Cornwall.] In his *Cornish Fauna: a Short Account of all the Animals found in the County*, p. 46. Truro, dy. 8vo, 1867. (Enumerates 10 species.)

CORNISH, THOMAS.—[The Reptiles of Cornwall.] Jonathan Couch's *Cornish Fauna* [q. v.]; revised by Thomas Cornish. *The Journal of the Royal Institution of Cornwall*, vol. xix, pp. 425-427. Truro, dy. 8vo, 1877. (A good list; published separately, with new title-page, 1878; enumerates 10 species.)

TREGELLES, G. F.—[The Reptiles of West Cornwall & the Scilly Islands.] In E. Whitfield Crofts' *Tourists' Companion to West Cornwall & the Scilly Islands*, p. 30. London, cr. 8vo, 1887.

CUMBERLAND.

HEYSHAM, DR. JOHN.—[The Reptiles of Cumberland.] In Wm. Hutchinson's *History of the County of Cumberland*, vol. i, p. 23. Carlisle & London, 2 vols., dy. 4to, 1794. (A good list; enumerates 9 species.)

MACPHERSON, REV. H. A.—[The Reptiles of Cumberland.] In his *Vertebrate Fauna of Lakeland*, pp. 461-465. Edinburgh, dy. 8vo, 1892. (A good list; enumerates 9 species.)

DERBYSHIRE.

LEIGH, CHARLES.—[The Reptiles of Derbyshire.] In his *Natural History of Lancashire, Cheshire, & the Peak in Derbyshire*, pp. 147-157. Oxford, fcap. fo., 1700. (An unsatisfactory list, in which insects are included.)

GLOVER, STEPHEN.—[The Reptiles of Derbyshire.] In his *History & Gazetteer of the County of Derby*, vol. i, pp. 153-154. Derby, 2 vols., dy. 4to, 1831. (Enumerates 8 species.)

DEVONSHIRE.

POLWHELE, Rev. R.—[The Reptiles of Devonshire.] In his *History of Devonshire*, vol. i, pp. 124-125. Exeter & London, dy. fol., 1797. (An excellent list for the period; enumerates 7 species.)

[Anon.]—[The Reptiles of Devonshire.] *Monthly Magazine*, vol. xxvi, p. 528. London, dy. 8vo, 1808. (Enumerates 10 species.)

TURTON, W., & J. F. KINGSTON.—[The Reptiles of the Teignmouth District.] In their *Natural History of the District [around Teignmouth]*, 3 pp. Teignmouth, fcap. 8vo, n. d. [1830.]

BELLAMY, J. C.—List of the Amphibia of South Devon. In his *Natural History of South Devon*, p. 236. Plymouth and London, post 8vo, 1839. (Enumerates 10 species.)

ROWE, J. BROOKING.—The Reptiles & Amphibians of Devon. In his *Catalogue of the Mammals, Birds, Reptiles & Amphibians of Devon*, pp. 47-50. London & Plymouth, dy. 8vo, 1863. (A good list; enumerates 12 species.)

PARFITT, E.—[The Reptiles of Devonshire.] *Trans. Devonsh. Assoc.*, vol. ix, pp. 236-242. Plymouth, dy. 8vo, 1877. (An excellent list; enumerates 15 species.)

DORSETSHIRE.

DALE, J. C.—Catalogue of the . . . Reptiles found in Dorsetshire. *The Naturalist* (Neville Wood's), vol. ii, pp. 182-183. London, roy. 8vo, 1837. (Enumerates 7 species.)

DALE, C. W.—[The Reptiles of Glanville's Wootton.] In his *History of Glanville's Wootton*, pp. 37-38. London, cr. 8vo, 1878. (Enumerates 8 species.)

DURHAM.

LEBOUR, Prof. G. A.—[The Reptiles of Durham.] In his *Outlines of the Geology of Northumberland & Durham*, p. 158. Newcastle-on-Tyne, cr. 8vo, 1886. (Enumerates 6 species.)

ESSEX.

BUXTON, E. N.—[The Reptiles of Epping Forest.] In his *Epping Forest*, p. 83. London, med. 8vo, 1884. (Enumerates only 3 species; also in the 2nd ed., p. 80, London, fcap. 8vo, 1885; and in the 3rd ed., 1890.)

LAVER, HENRY.—The Reptiles of Essex. To form part of his *Vertebrate Fauna of Essex*. (In preparation.)

GLAMORGANSHIRE.

PROGER, T. W.—List of . . . Reptilia occurring in the Neighbourhood of Cardiff. *Handbook for Cardiff & District, prepared for the use of the British Association*, pp. 152-153. Cardiff, 8vo, 1891. (Enumerates 10 species.)

GLOUCESTERSHIRE.

WITCHELL, CHAS. A.—[The Reptiles of Gloucestershire.] In Witchell & Strugnell's *Fauna & Flora of Gloucestershire*, pp. 124-148. Stroud, roy. 8vo, 1892. (A good list; enumerates 10 species.)

HAMPSHIRE. (*See also* WIGHT, ISLE OF.)

BELL, THOS.—Reptilia and Amphibia found at Selborne. In his edition of White's *Natural History and Antiquities of Selborne*, vol. ii, p. 366. London, roy. 8vo, 1877. (Enumerates 10 species.)

HAVILAND, W. A.—[The Reptiles of the Winchester District.] *The Fifth Report of the Winchester College Natural History Society*, p. 119. Winchester, dy. 8vo, 1881. (Enumerates 8 species.)

HEREFORDSHIRE.

LINGWOOD, R. M.—[The Reptiles of a Part of Herefordshire.] *Ann. Nat. Hist.*, vol. v, pp. 187-188. London, dy. 8vo, 1840. (Enumerates 8 species.)

HUNTINGDONSHIRE.

MILLER, S. H., & S. B. J. SKERTCHLY.—[The Reptiles of the Fenland.] In their *Fenland, Past & Present*, pp. 388-390. pp. 388-390. Wisbeach & London, roy. 8vo, 1878. (A good list; enumerates 10 species.)

KENT.

BOYS, WM.—[The Reptiles of Sandwich & its Neighbourhood.] In his *Collections for an History of Sandwich*, p. 854. Canterbury, dy. 4to, 1792. (Enumerates 8 species without comments.)

LANCASHIRE.

LEIGH, CHAS.—[The Reptiles of Lancashire.] In his *Natural History of Lancashire, Cheshire, & the Peak in Derbyshire*, pp. 147-157. Oxford, fcap. fo., 1700. (An unsatisfactory list, in which insects are mixed up.)

BYERLEY, ISAAC.—[The Reptiles of Liverpool.] In his *Fauna of Liverpool*, pp. 24-25. London & Liverpool, 8vo, 1856. (Enumerates 11 species.)

McNICHOLL, D. H.—The Reptiles & Amphibia of Southport. In his *Handbook for Southport*, 2nd ed., pp. 97-101. London, cr. 8vo, 1861. (Enumerates 7 species; 1st ed. not seen.)

[Anon.]—[List of Reptiles found round Bury]. *Report of the Bury Nat. Hist. Soc.*, 1868-71, pp. 49-51. Bury, 8vo, 1872.

MACPHERSON, Rev. H. A.—[The Reptiles of Lancashire north of the Sands.] In his *Vertebrate Fauna of Lakeland*, pp. 461-465. Edinburgh, dy. 8vo, 1892. (A good list.)

LEICESTERSHIRE.

BROWNE, MONTAGU.—[The Reptiles of Leicestershire.] *Zoologist*, 3rd series, vol. xi, pp. 57-59. London, dy. 8vo, 1887. (Enumerates 9 species.)

BROWNE, MONTAGU.—The Reptiles of Leicestershire & Rutland. In his *Vertebrate Animals of Leicestershire & Rutland*, pp. 173-182. Birmingham & Leicester, cr. 4to, 1889. (A good list, but includes fossil species.)

LINCOLNSHIRE.

MILLER, S. H., & S. B. J. SKERTCHLY.—[The Reptiles of the Fenland.] In their *Fenland, Past & Present*, pp. 388-390. Wisbeach & London, roy. 8vo, 1878. (A good list; enumerates 10 species.)

MAN, ISLE OF.

FORBES, E.—[The Reptiles of the Isle of Man.] In *Quiggin's Illustrated Guide . . . to the Isle of Man*, 2nd ed., p. 40. Douglas, imp. 16mo, 1839.

KERMODE, P. M. C.—Reptiles [of the Isle of Man.] *Zoologist*, 3rd series, vol. xvii, pp. 64-65. London, dy. 8vo, 1893. (Enumerates only two indigenous species of lizard.)

NORFOLK.

PAGET, C. J. & J.—[The Reptiles of the Yarmouth District.] In their *Sketch of the Natural History of Yarmouth & its Neighbourhood*, p. 14. London, dy. 8vo, 1834. (Enumerates 10 species.)

LOWNE, B. T.—[The Reptiles of the Yarmouth District.] In his *Popular Natural History of Great Yarmouth & its Neighbourhood*, pp. 30 & 55. Yarmouth, London, & Norwich, cr. 8vo, 1863. (Enumerates 9 species.)

HUNT, A. LEIGH.—[The Reptiles of Thetford.] In his *Capital of the Ancient Kingdom of East Anglia*, pp. 238-239. London, dy. 8vo, 1870. (An unimportant list; see *Trans. Norf. & Norw. Nat. Soc.*, vol. i, pp. 83-87.)

SOUTHWELL, THOS.—[The Reptiles of Norfolk.] *Trans. Norf. and Norw. Nat. Soc.*, vol. i, pp. 81-82. Norwich, dy. 8vo, 1874. (Enumerates 10 species.)

MILLER, S. H., & S. B. J. SKERTCHLY.—[The Reptiles of the Fenland.] In their *Fenland, Past & Present*, pp. 388-390. Wisbeach & London, roy. 8vo, 1878. (A good list; enumerates 10 species.)

NORTHAMPTONSHIRE.

MORTON, Rev. JOHN.—[The Reptiles of Northamptonshire.] In his *Natural History of Northamptonshire*, pp. 439-442. London, fcap. fo., 1712. (Enumerates 9 species.)

NORTHUMBERLAND.

WALLIS, JOHN.—[The Reptiles of Northumberland.] In his *Natural History of Northumberland*, pp. 371-372. London, 2 vols., dy. 4to, 1769. (Enumerates only 4 species.)

MACKENZIE, E.—[The Reptiles of Northumberland.] In his *View of the County of Northumberland*, vol. i, p. 167. Newcastle-on-Tyne, 2 vols., dy. 8vo, 1811. (Enumerates 3 species only.)

SELBY, P. J.—[The Reptiles of Twizel.] In *Mag. of Zool. and Bot.*, vol. ii, p. 397. Edinb., Lond., & Dublin, dy. 8vo, 1837. (Enumerates 7 species.)

EMBLETON, ROBERT C.—[The Reptiles of the Alnwick District.] In Geo. Tate's *History of . . . Alnwick*, vol. ii, p. 438. Alnwick, dy. 8vo, 1868-69. (Enumerates 7 species.)

LEBOUR, Prof. G. A.—[The Reptiles of Northumberland.] In his *Outlines of the Geology of Northumberland & Durham*, p. 158. Newcastle-on-Tyne, cr. 8vo, 1886. (Enumerates 6 species.)

OXFORDSHIRE.

BEESLEY, ALFRED.—[The Reptiles of the Banbury District.] In his *History of Banbury*, p. 604. London, dy. 8vo, n. d. [1841]. (Enumerates 8 species.)

RUTLANDSHIRE.

BROWNE, MONTAGU.—The Reptiles of Leicestershire and Rutland. In his *Vertebrate Animals of Leicestershire & Rutland*, pp. 173-182. Birmingham & Leicester, cr. 4to, 1889. (A good list, but includes fossil species.)

SHROPSHIRE.

EYTON, T. C.—[The Reptiles] of Shropshire & North Wales. *Mag. of Zool. & Bot.*, vol. iii, p. 24. London, dy. 8vo, 1839. (Enumerates 10 species.)

SOMERSETSHIRE.

BAKER, W.—Reptiles [of Somersetshire.] *Proceedings Somersetshire Archæological & Natural History Society, 1849-50*, pp. 147-148, & for 1851, pp. 116-122. Taunton & London, dy. 8vo, 1851-52. (A good list; enumerates 12 species.)

COMPTON, THEODORE.—[The Reptiles of the Winscombe District.] In his *Winscombe Sketches*, 2nd ed. London, cr. 8vo, n. d. [? 1882]. (Also in his *Mendip Valley*, pp. 183-184, an enlarged edition of the same work, London and Swindon, dy. 8vo, 1892.)

STAFFORDSHIRE.

PLOT, ROBT.—[The Reptiles of Staffordshire.] In his *Natural History of Staffordshire*, pp. 246-252. Oxford, fcap. fo., 1686.

PITT, WM.—Reptiles [of Staffordshire]. In his *Topographical History of Staffordshire*, [Appendix], pp. 158-159. Newcastle-under-Lyme, dy. 8vo, 1817. (Enumerates 8 species.)

GARNER, ROBT.—Reptiles [of Staffordshire.] In his *Natural History of the County of Stafford*, pp. 292-293. London, dy. 8vo, 1844. (Enumerates 9 species.)

BROWN, EDWIN.—[The Reptiles of the Burton-on-Trent District.] In Sir Oswald Mosley's *Natural History of Tutbury*, pp. 111-114. London, roy. 8vo, 1863. (Enumerates 9 species.)

MOSLEY, Sir OSWALD, Bart.—Reptiles [of the Tutbury District.] In his *Natural History of Tutbury*, pp. 59-63. London, roy. 8vo, 1863.

MASEFIELD, J. R. B.—The Reptiles of Staffordshire. In the *Reports of the North Staffordshire Naturalist's Field Club*. 1892. (Not seen.)

SUSSEX.

CHAMBERS, GEO. F.—[The Reptiles of the Eastbourne District.] In his *Handbook for Visitors to Eastbourne*, p. 89. London & Eastbourne, cr. 8vo, 1868. (Enumerates 7 species.)

EASTBOURNE NATURAL HISTORY SOCIETY, MEMBERS OF.—[The Reptiles of the Eastbourne District.] In their *Lists of the Local Fauna & Flora*, p. 4. [Eastbourne], cr. 8vo, 1873. (A list without comment; enumerates 8 species; a previous edition, dated 1871, not seen.)

WEAVER, J.—[Reptiles of Harting.] In the Rev. H. D. Gordon's *History of Harting*, pp. 296-302. London, cr. 8vo, 1877. (Enumerates 7 species.)

WALES, NORTH.

EYTON, T. C.—[The Reptiles] of Shropshire & North Wales. *Mag. of Zool. & Bot.*, vol. iii, p. 24. Edinb., Lond., & Dubl., dy. 8vo, 1839. (Enumerates 10 species.)

WESTMORELAND.

GOUGH, THOMAS.—Reptiles [of the Kendal District.] In Cornelius Nicholson's *Annals of Kendal*, 2nd ed., pp. 310-311. London & Kendal, dy. 8vo, 1861. (Enumerates 9 species; the 1st ed. did not contain the list.)

MACPHERSON, Rev. H. A.—[The Reptiles of Westmoreland.] In his *Vertebrate Fauna of Lakeland*, pp. 461-465. Edinburgh, dy. 8vo, 1892. (A good list; enumerates 9 species.)

WIGHT, ISLE OF.

WARNER, Rev. RICHARD.—[The Reptiles of the Isle of Wight.] In his *History of the Isle of Wight*, pp. 206-209. Southampton and London, dy. 8vo, 1795.

BURY, Rev. C. A.—Notes on the Reptiles of the Isle of Wight, *Zoologist*, vol. iii, pp. 1027-1033. London, dy. 8vo, 1845. (Enumerates 8 species.)

MARTIN, G. A.—[The Reptiles of the Undercliff.] In his *Undercliff of the Isle of Wight*, pp. 203-208. London, post 8vo, 1849.

MORE, A. G.—Reptiles [of the Isle of Wight.] In the Rev. E. Venables' *Guide to the Isle of Wight*, pp. 437-439. London, fcap. 8vo, 1860. (Enumerates 9 species.)

WILTSHIRE.

MATON, GEO., M.D.—[The Reptiles of the Salisbury District.] In his *Natural History of a Part of the County of Wilts*, p. 69. London, dy. 8vo, 1843. (Very incomplete; enumerates 4 species only.)

AUBREY, JOHN.—[The Reptiles of Wiltshire.] In his *Natural History of Wiltshire; written between 1656 & 1691; edited by John Britton*, p. 66. London, dy. 4to, 1847. (A meagre list.)

WORCESTERSHIRE.

HASTINGS, CHAS., M.D.—[The Reptiles of Worcestershire.] In his *Illustrations of the Natural History of Worcestershire*, pp. 72-73. London & Worcester, dy. 8vo, 1834. (Enumerates 8 species.)

YORKSHIRE.

DENNY, HY.—Sketch of the [Reptiles] of Leeds and its Vicinity. *Annals of Nat. Hist.*, vol. v, p. 392. London, dy. 8vo, 1840. (Enumerates 8 species.)

NETTLETON, WM.—[The Reptiles of the Huddersfield District] In Chas. P. Hobkirk's *Huddersfield: its History & Natural History*, 2nd ed., p. 221. Huddersfield & London, cr. 8vo, 1868. (Enumerates 8 species.)

ROEBUCK, W. D.—[The Reptiles of Yorkshire.] In Clarke and Roebuck's *Handbook of the Vertebrate Fauna of Yorkshire*, pp. ix-x, xli, & 91-96. London & Leeds, dy. 8vo, 1881. (An excellent list; enumerates 12 species.)

CLARKE, W. EAGLE, & W. D. ROEBUCK.—[The Reptiles of Washburndale.] *Naturalist*, vol. ix, p. 16. Huddersfield, dy. 8vo, 1884. (Enumerates only 3 species.)

WAITE, EDGAR R.—[The Reptiles of the Western Ainsty.] *The Naturalist*, 1891, pp. 110-111. London, dy. 8vo, 1891. (Enumerates 8 species.)

WOODD, C. H. B.—[The Reptiles of Langstrothdale.] *The Naturalist*, 1891, pp. 138-139. London, dy. 8vo, 1891.

CLARKE, W. EAGLE, W. D. ROEBUCK, & WM. STOREY.—[The Reptiles of Upper Nidderdale.] *Naturalist*, vol. xi, pp. 204-205. Huddersfield, dy. 8vo, 1886. (Enumerates only 6 species.)

SCOTLAND.

GENERAL.

PENNANT, W.—[The Reptiles of Scotland.] In the Rev. J. Lightfoot's *Flora Scotica*, vol. i, pp. 47-49. London, 2 vols., dy. 8vo, 1777. (Enumerates 7 species.)

ABERDEENSHIRE.

MACGILLIVRAY, Prof. WM.—Reptiles [of Braemar.] In his *Natural History of Deeside & Braemar*, pp. 409-412. London, dy. 8vo, 1855. (Enumerates 6 species.)

ARGYLL.

HARVIE-BROWN, J. A., & T. E. BUCKLEY.—[The Reptiles of Argyll & the Inner Hebrides.] In their *Vertebrate Fauna of Argyll & the Inner Hebrides*, pp. 216-218. Edinburgh, fcap. 4to, 1892. (Enumerates 6 species.)

CAITHNESS.

HARVIE-BROWN, J. A., & T. E. BUCKLEY.—[The Reptiles of Caithness.] In their *Vertebrate Fauna of Sutherland, Caithness, and West Cromarty*, pp. 247-251. Edinburgh, fcap. 4to, 1887.

CROMARTY.

HARVIE-BROWN, J. A., & T. E. BUCKLEY.—[The Reptiles of West Cromarty.] In their *Vertebrate Fauna of Sutherland, Caithness & West Cromarty*, pp. 247-251. Edinburgh, fcap. 4to, 1887.

FORFARSHIRE.

DON, G.—[The Reptiles of Forfarshire.] In the Rev. J. Headrick's *General View of the Agriculture of . . . Forfarshire*, p. 460 & App. pp. 44-45. Edinb. & London, dy. 8vo, 1813.

HEBRIDES.

DUNS, Prof.—[The Reptiles of Lewis.] *Proc. Roy. Soc. of Edinb.*, vol. v, p. 619. Edinb., 8vo, 1866. (Enumerates two species.)

HARVIE-BROWN, J. A., & T. E. BUCKLEY.—[The Reptiles of the Outer Hebrides.] In their *Vertebrate Fauna of the Outer Hebrides*, pp. 170-171. Edinburgh, fcap. 4to, 1888. (Enumerates only one species—the Blind-worm.)

INVERNESS.

DUNS, Prof. J.—[The Reptiles of Mid-Lochaber.] *Proc. Roy. Phys. Soc. of Edinb.*, vol. vii, p. 169. Edinburgh, dy. 8vo, 1883. (Enumerates 5 species.)

KIRCUDBRIGHT.

SERVICE, ROBT.—Reptiles [of Kircudbright] In *Maxwell's Guide-book to the Stewartry of Kircudbright*, 4th ed., p. 143. Castle-Douglas, cr. 8vo, 1884.

LANARKSHIRE.

CAMPBELL, J. M.—[The Reptiles of Clydesdale and the West of Scotland.] In *A Contribution towards a Complete List of the Fauna & Flora of Clydesdale & the West of Scotland*, p. 11. Glasgow, cr. 8vo, 1876. (Enumerates 8 species.)

ORKNEY.

BARRY, Rev. G.—[The Reptiles of Orkney.] In his *History of the Orkney Islands*, pp. 298-299. Edinburgh & London, dy. 4to, 1805. (Enumerates two species only; reprinted *verbatim* in the 2nd ed., London, dy. 4to, 1808, pp. 305-306; also in the 3rd ed., Kirkwall, cr. 8vo, 1867, pp. 291-292.)

Low, Rev. GEO.—[The Reptiles of Orkney.] In his *Fauna Orcadensis*, pp. 153-156. Edinburgh, dy. 4to, 1813. (Enumerates two species.)

BUCKLEY, T. E., & J. A. HARVIE-BROWN.—[The Reptiles of the Orkney Islands.] In their *Vertebrate Fauna of the Orkney Islands*, p. 265. Edinburgh, fcap. 4to, 1891. (Enumerates two species only.)

PEEBLESSHIRE.

[NEILL, PATRICK.]—[The Reptiles of Tweeddale.] In the *Works of Alexander Pennecuik, Esq.*, p. 107. Edinburgh, &c., dy. 8vo, 1815. (Enumerates 5 species.)

CHAMBERS, W.—[The Reptiles of Peeblesshire.] In his *History of Peeblesshire*, p. 528. Edinburgh & London, roy. 8vo, 1864. (Enumerates 6 species only.)

ROSS-SHIRE.

DIXON, J. H.—[The Reptiles of Gairloch.] In his *Gairloch, &c.*, p. 233. Edinburgh, dy. 8vo, 1886.

SHETLAND.

Low, Rev. GEO.—[The Reptiles of Shetland.] In his *Fauna Orcadensis*, pp. 153-156. Edinburgh, dy. 4to, 1813. (Enumerates two species.)

SUTHERLANDSHIRE.

ALSTON, EDW. R., & J. A. HARVIE-BROWN.—On the Mammals and Reptiles of Sutherland, *Proc. Nat. Hist. Soc. of Glasgow*, vol. ii, pp. 147-149. Glasgow, dy. 8vo, 1876. (Enumerates 8 species.)

BUCKLEY, T. E., & J. A. HARVIE-BROWN.—[The Reptiles of Sutherlandshire.] In *St. John's Tour in Sutherlandshire*, 2nd ed., vol. ii, pp. 329-330. Edinburgh, cr. 8vo, 1884. (An admirable list; enumerates 8 species.)

HARVIE-BROWN, J. A., & T. E. BUCKLEY.—[The Reptiles of Sutherland.] In their *Vertebrate Fauna of Sutherland, Caithness, & West Cromarty*, pp. 247-251. Edinburgh, fcap. 4to, 1887.

IRELAND.

GENERAL.

TEMPLETON, ROBT.—[The Reptiles of Ireland.] *Mag. of Nat. Hist.*, new series, vol. i, p. 408. London, dy. 8vo, 1837. (Enumerates 5 species.)

THOMPSON, WM.—[The Reptiles of Ireland.] In his *Report on the Fauna of Ireland in the Report of the British Association for 1840*, pp. 383-384 & 406. London, dy. 8vo, 1841. Enumerates 8 species.)

THOMPSON, WM.—[The Reptiles of Ireland.] In his *Natural History of Ireland*, vol. iv, pp. 61-68. London, dy. 8vo, 1856. (An excellent list.)

ANTRIM.

BELFAST NATURALISTS' FIELD CLUB, MEMBERS OF.—[The Reptiles of the Belfast District.] In their *Guide to Belfast and the Adjacent Counties*, pp. 104-105. Belfast, fcap. 8vo, 1874.

CORK.

HARVEY, DR. J. R.—[The Reptiles of the County of Cork.] In his *Contributions towards a Fauna & Flora of the County of Cork*, p. 17. London & Cork, dy. 8vo, 1845. (Enumerates 2 species only.)

DOWN.

BELFAST NATURALISTS' FIELD CLUB, MEMBERS OF.—[The Reptiles of the Belfast District.] In their *Guide to Belfast and the Adjacent Counties*, pp. 104-105. Belfast, fcap. 8vo, 1874.

WEXFORD.

BARRETT-HAMILTON, G. E. H.—The Reptiles of the County Wexford. To form part of his *Fauna and Flora of the County Wexford*. (In preparation.)

In reviewing the Catalogue of Local Lists of Reptiles, we observe that England is again pretty well covered. Some of the counties have been done with fair thoroughness, but Berkshire, Buckinghamshire, Hertfordshire, Middlesex, Monmouthshire, Nottinghamshire, Suffolk, Surrey, and Warwickshire do not appear at all in the list, while many others have been very imperfectly studied. As regards Wales, much remains to be done, as Carnarvonshire and Glamorganshire are the only

counties appearing in the Catalogue. The Reptiles of a few Scottish districts have been very thoroughly catalogued, chiefly by Messrs. Harvie-Brown and Buckley; but, as regards the country as a whole, very much remains to be done, as only a small number of Scottish counties appear at all in the list. As regards Ireland, the Lists of Reptiles are, as might have been expected, extremely meagre, only six lists appearing in the Catalogue.

FISHES.

ENGLAND AND WALES.

BEDFORDSHIRE.

DAVIS, FREDERICK.—Fishes of the Neighbourhood [of Luton]. In his *History of Luton*, pp. 199-200. Luton, dy. 8vo, 1855. (Enumerates 19 species.)

MILLER, S. H., & S. B. J. SKERTCHLY.—[The Fishes of the Fenland.] In their *Fenland, Past & Present*, pp. 391-400. Wisbeach & London, roy. 8vo, 1878. (A good list; largely extracted from Dr. John Lowe's article on the Fishes of Norfolk, *q. v.*, in *Trans. Norf. & Norw. Nat. Soc.*, vol. i, pt. v, pp. 21-56, and vol. iii, pp. 677-682).

CAMBRIDGESHIRE.

MILLER, S. H., & S. B. J. SKERTCHLY.—[The Fishes of the Fenland.] In their *Fenland, Past & Present*. See BEDFORDSHIRE.

CHESHIRE.

LEIGH, CHAS.—[The Fishes of Cheshire.] In his *Natural History of Lancashire, Cheshire, & the Peak in Derbyshire*, pp. 130-147. Oxford, fcap. fo., 1700. (A partial list merely, including various molluscs, star-fish, &c.)

CORNWALL.

BORLASE, Rev. WM.—[The Fishes of Cornwall.] In his *Natural History of Cornwall*, pp. 261-274. Oxford, fcap. fo., 1758. (An extensive list for the period.)

[Anon.]—[The Fishes of Cornwall.] *Monthly Magazine*, vol. xxvi, pp. 528-529, & vol. xxvii. London, dy. 8vo, 1808 & 1809. (An extensive list, but apparently never completed.)

COUCH, JONATHAN.—[The Fishes of Cornwall.] In his *Cornish Fauna; being a Compendium of the Natural History of the County*, pp. 31-63. Truro, dy. 8vo, 1838. (A good and extensive list; for 2nd ed., see under Cornish (Thos.).)

COCKS, W. P.—[The Fishes of the Falmouth District.] *Naturalist* (Morris's), vol. ii, pp. 16-18, 30-32, & 106. London, roy. 8vo, 1852.

BULLMORE, W. K.—[The Fishes of Cornwall.] In his *Cornish Fauna: a short Account of all the Animals found in the County*, pp. 47-60. Truro, dy. 8vo, 1867. (An extensive list.)

CORNISH, THOS.—[The Fishes of Cornwall.] In Couch's *Cornish Fauna*; corrected and revised by Thomas Cornish. *Journal of the Royal Institution of Cornwall*, no. xix, pp. 428-450. Truro, dy. 8vo, 1877. (An extensive and valuable list.)

TREGELLES, G. F.—[The Fishes of West Cornwall and the Isles of Scilly.] In E. Whitfield Crofts' *Tourists' Companion to West Cornwall & the Scilly Islands*, p. 30. London, cr. 8vo, 1887.

CUMBERLAND.

HEYSHAM, DR. JOHN.—[The Fishes of Cumberland.] In Wm. Hutchinson's *History of the County of Cumberland*, pp. 24-33. Carlisle & London, 2 vols., dy. 4to, 1794. (A good list for the period; enumerates 76 species.)

MACPHERSON, REV. H. A.—[The Fishes of Cumberland.] In his *Vertebrate Fauna of Lakeland*, pp. 466-526. Edinburgh, dy. 8vo, 1892. (An excellent list; enumerates 97 species.)

DERBYSHIRE.

LEIGH, CHAS.—[The Fishes of the Peak District.] In his *Natural History of Lancashire, Cheshire, & the Peak in Derbyshire*. See CHESHIRE.

GLOVER, STEPHEN.—[The Fishes of Derbyshire.] In his *History & Gazetteer of the County of Derby*, vol. i, pp. 148-153. Derby, 2 vols., dy. 4to, 1831. (A fair list.)

DEVONSHIRE.

POLWHELE, REV. R.—[The Fishes of Devonshire.] In his *History of Devonshire*, vol. i, pp. 113-121. Exeter & London, dy. fol., 1797. (An excellent list for the period, but includes the Cetacea, some molluscs, &c.)

[Anon.]—[The Fishes of Devonshire.] *Monthly Magazine*, vol. xxvi, pp. 528-529, & vol. xxvii. See CORNWALL.

TURTON, W., & J. F. KINGSTON.—[The Fishes of Devonshire.] In their *Natural History of the District [around Teignmouth. 8 pp.]* Teignmouth, fcap. 8vo, n. d. [1830].

BELLAMY, J. C.—Catalogue of Fishes . . . of South Devon. In his *Natural History of South Devon*, pp. 237-245. Plymouth and London, post 8vo, 1839. (A careful and detailed list.)

PARFITT, E.—[The Fishes of Devonshire.] *Trans. Devonsh. Assoc.*, vol. vii, pp. 106-149. Plymouth, dy. 8vo, 1875. (An excellent list; enumerates 178 species.)

DORSETSHIRE.

DALE, C. W.—[The Fishes of Glanville's Wootton.] In his *History of Glanville's Wootton*. London, cr. 8vo, 1878. (Enumerates 11 species.)

DURHAM.

SHARP, Sir CUTHBERT.—Fishes caught on the Hartlepool Coast. In his *History of Hartlepool*, app. p. xviii. Durham, med. 8vo, 1816. (An incomplete list; also in the 2nd edition, Hartlepool, med. 8vo, 1851, p. xviii.)

HOGG, JOHN.—Fishes caught in the Tees near Stockton and in his Tributary Rivulets. In Brewster's *Parochial History and Antiquities of Stockton-upon-Tees*, 2nd ed., app. 2, pp. 17-19. Stockton & London, roy. 8vo, 1829. (A very imperfect list; enumerates only 19 species; the list did not appear in the 1st ed., Stockton & London, dy. 4to, 1796.)

HOWSE, RICHARD.—Catalogue of the Fishes of the Rivers of Northumberland & Durham, and the adjacent Sea. In *Nat. Hist. Trans. of Northumberland & Durham, &c.*, vol. x, pp. 327-390. London & Newcastle-upon-Tyne, dy. 8vo, 1890. (An excellent list; enumerates 142 species.)

ESSEX.

LAVER, HENRY.—The Fishes of Essex. To form part of his *Vertebrate Fauna of Essex*. (In preparation.)

GLAMORGANSHIRE.

DILLWYN, L. W.—List of the Rarer Fishes [of Swansea], with remarks on some of the more common species. In his *Materials for a Fauna & Flora of Swansea & Neighbourhood*, pp. 11-17. Swansea, roy. 8vo, 1848.

NEALE, J. J.—[The Fishes of the Cardiff District.] *Handbook for Cardiff and District, prepared for the use of the British Association*, pp. 193-199. Cardiff, cr. 8vo, 1891.

GLOUCESTERSHIRE.

WITCHELL, CHAS. A.—[The Fishes of Gloucestershire.] In *Witchell & Strugnell's Fauna & Flora of Gloucestershire*, pp. 149-166. Stroud, roy. 8vo, 1892. (A good list; enumerates 31 species.)

HAMPSHIRE (See also WIGHT, ISLE OF).

HAVILAND, W. A.—[The Fishes of the Winchester District.] *The Fifth Report of the Winchester College Natural History Society*, p. 119. Winchester, dy. 8vo, 1881. (Enumerates 15 species.)

HEREFORDSHIRE.

LINGWOOD, R. M.—[The Fishes of a part of Herefordshire.] *Ann. Nat. Hist.*, vol. v, p. 188. London, dy. 8vo, 1840. (Enumerates 17 species.)

HUNTINGDONSHIRE.

MILLER, S. H., & S. B. J. SKERTCHLY.—[The Fishes of the Fenland.] In their *Fenland, Past & Present*. See BEDFORDSHIRE.

KENT.

BOYS, WM.—[The Fishes of Sandwich & its Neighbourhood.] In his *Collections for a History of Sandwich*, pp. 854-856. Canterbury, dy. 4to, 1792. (A very incomplete list, and without comments.)

LANCASHIRE.

LEIGH, CHAS.—[The Fishes of Lancashire.] In his *Natural History of Lancashire, Cheshire, & the Peak in Derbyshire*. See CHESHIRE.

BYERLEY, ISAAC.—[The Fishes of Liverpool.] In his *Fauna of Liverpool*, pp. 25-34. London & Liverpool, dy. 8vo, 1856.

[Anon.]—[List of Fish found round Bury.] *Report of the Bury Nat. Hist. Soc.*, 1868-71, pp. 49-51. Bury, dy. 8vo, 1872.

MACPHERSON, Rev. H. A.—[The Fishes of Lancashire north of the Sands.] In his *Vertebrate Fauna of Lakeland*. See CUMBERLAND.

LEICESTERSHIRE.

BROWNE, MONTAGU.—[The Fishes of Leicestershire.] *Zoologist*, 3rd series, vol. xi, pp. 59-61. London, dy. 8vo, 1887. (Enumerates 27 species.)

BROWNE, MONTAGU.—The Fishes of Leicestershire & Rutland. In his *Vertebrate Animals of Leicestershire & Rutland*, pp. 183-202. Birmingham & Leicester, cr. 4to, 1889. (A good list, but includes fossil species.)

LINCOLNSHIRE.

MILLER, S. H., & S. B. J. SKERTCHLY.—[The Fishes of the Fenland.] In their *Fenland, Past & Present*. See BEDFORDSHIRE.

MAN, ISLE OF.

FORBES, E.—[The Fishes of the Isle of Man.] In *Quiggin's Illustrated Guide . . . to the Isle of Man*, 2nd ed., pp. 40-41. Douglas, imp. 16mo., 1839.

KERMODE, P. M. C.—Fishes [of the Isle of Man.] *Zoologist*, 3rd series, vol. xvii, pp. 61-64. London, dy. 8vo, 1893. (An extensive list; enumerates only 6 fresh-water species.)

NORFOLK.

BROWNE, Sir THOS.—An Account of Fishes, &c., found in Norfolk and on the Coast. In his *Works*, edited by Simon Wilkin, vol. iv, pp. 325-336. London & Norwich, 4 vols., dy. 8vo, 1835. (An interesting list, written about the year 1670.)

PAGET, C. J. & J.—[The Fishes of the Yarmouth District.] In their *Sketch of the Natural History of Yarmouth and its Neighbourhood*, pp. 14-18. London, dy. 8vo, 1834. (Enumerates a good number of species.)

LUBBOCK, Rev. R.—[The River Fishes of Norfolk.] In his *Observations on the Fauna of Norfolk, and more particularly on the District of the Broads*, pp. 125-153. Norwich & London, dy. 8vo, 1845. (A valuable list; also in the 2nd ed., edited by Messrs. Southwell, Stevenson, and Newton, pp. 175-208, Norwich & London, dy. 8vo, 1879.)

LOWNE, B. T.—[The Fishes of the Yarmouth District.] In his *Popular Natural History of Great Yarmouth & its Neighbourhood*, pp. 27-30 & 53-55. Yarmouth, London, and Norwich, cr. 8vo, 1863. (A fair list.)

HUNT, A. LEIGH.—[The Fishes of Thetford.] In his *Capital of the Ancient Kingdom of East Anglia*, pp. 235-236. London, dy. 8vo, 1870. (An unimportant list; see *Trans. Norf. & Norw. Nat. Soc.*, vol. i, pp. 83-87.)

LOWE, JOHN.—[The Fishes of Norfolk.] *Trans. Norf. & Norw. Nat. Soc.*, vol. i, pt. v, pp. 21-56. Norwich, dy. 8vo, 1874. (An admirable and extensive list; additions vol. iii, 1884, pp. 677-682.)

MUNFORD, Rev. GEO.—[The Fishes of the Hunstanton District.] In Philip Wilson's *Hunstanton & its Neighbourhood*, pp. 72-77. Lynn & London, fcap. 8vo, 1879. (A fairly extensive list.)

LOWE, JOHN.—A List of the Fishes known to occur in the Norfolk Waters. In R. H. Mason's *History of Norfolk*, app., pp. xiii-xx. London, roy. 4to, 1884. (A good and extensive list.)

MILLER, S. H., & S. B. J. SKERTCHLY.—[The Fishes of the Fenland.] In their *Fenland, Past & Present*. See BEDFORDSHIRE.

NORTHAMPTONSHIRE.

MORTON, Rev. JOHN.—[The Fishes of Northamptonshire.] In his *Natural History of Northamptonshire*, pp. 419-423. London, fcap. fo., 1712. (A fairly good list.)

NORTHUMBERLAND.

WALLIS, JOHN.—[The Fishes of Northumberland.] In his *Natural History & Antiquities of Northumberland*, pp. 376-404.

London, 2 vols., dy. 4to, 1769. (A very good list for the period.)

[MACKENZIE, E.]—[The Fishes of Northumberland.] In his *View of the County of Northumberland*, vol. i, pp. 161-165. Newcastle-on-Tyne, 2 vols., dy. 8vo, 1811. (A very incomplete list; reprinted almost *verbatim* in the 2nd ed., vol. i, pp. 121-123, Newcastle-on-Tyne, 2 vols., dy. 4to, 1825.)

SELBY, P. J.—[The Fishes of Twizel.] In *Mag. of Zool. and Bot.*, vol. ii, p. 397. Edinburgh, London, & Dublin, dy. 8vo, 1837.

EMBLETON, ROBERT C.—[The Fishes of the Alnwick District.] In Geo. Tate's *History of . . . Alnwick*, vol. ii, pp. 437-438. Alnwick, dy. 8vo, 1868-69. (A list merely, without comments; enumerates 62 species.)

HOWSE, RICHARD.—Catalogue of the Fishes of the Rivers of Northumberland & Durham, and the adjacent Sea. See DURHAM.

OXFORDSHIRE.

PLOT, ROBERT.—[The Fishes of Oxfordshire.] In his *Natural History of Oxfordshire*, pp. 183-185. London, feap. fo., 1677. (A very meagre list; reprinted, almost *verbatim*, in the 2nd edition, London, feap. fo., 1705, pp. 187-189.)

BESSEY, ALFRED.—[The Fishes of the Banbury District.] In his *History of Banbury*, pp. 604-605. London, dy. 8vo, n.d. [1841]. (Enumerates 20 species.)

RUTLANDSHIRE.

BROWNE, MONTAGU.—The Fishes of Leicestershire & Rutland. In his *Vertebrate Animals of Leicestershire & Rutland*. See LEICESTERSHIRE.

SHROPSHIRE.

EYTON, T. C.—[The Fishes] of Shropshire & North Wales. *Mag. of Zool. & Bot.*, vol. iii, pp. 24-29. Edinburgh, London, and Dublin, dy. 8vo, 1839. (A good list.)

SOMERSETSHIRE.

COMPTON, THEODORE.—[The Fishes of the Winscombe District.] In his *Winscombe Sketches*, 2nd ed., pp. 134-137. London, cr. 8vo, n. d. [? 1882]. (Also in his *Mendip Valley*, pp. 181-183, an enlarged edition of the same work, London and Swindon, dy. 8vo, 1892.)

BAKER, W.—Fishes [of Somersetshire]. *Proceedings Somersetshire Archæological and Natural History Society for 1851*, pp. 97-110. Taunton & London, dy. 8vo, 1851-52. (A considerable list.)

STAFFORDSHIRE.

PLOT, ROBT.—[The Fishes of Staffordshire.] In his *Natural History of Staffordshire*, pp. 240-246. Oxford, fcap. fo., 1686.

PITT, WM.—Fishes [of Staffordshire.] In his *Topographical History of Staffordshire*, [Appendix], pp. 159-160. Newcastle-under-Lyme, dy. 8vo, 1817.

GARNER, ROBT.—List of Fishes [of Staffordshire.] In his *Natural History of the County of Stafford*, pp. 294-298. (A fairly extensive list.)

BROWN, EDWIN.—[The Fishes of the Burton-on-Trent District.] In Sir Oswald Mosley's *Natural History of Tutbury*, pp. 114-118. London, roy. 8vo, 1863. (Enumerates 32 species.)

MOSLEY, Sir OSWALD, Bart.—Fishes [of the Tutbury District.] In his *Natural History of Tutbury*, pp. 64-82. London, roy. 8vo, 1863. (A good list; enumerates about 23 species.)

SUSSEX.

CHAMBERS, GEO. F.—Fishes [of the Eastbourne District.] In his *Handbook for Visitors to Eastbourne*, pp. 89-90. London and Eastbourne, cr. 8vo, 1868. (A very imperfect list.)

EASTBOURNE NATURAL HISTORY SOCIETY, MEMBERS OF.—[The Fishes of the Eastbourne District.] In their *Lists of the Local Fauna & Flora*, pp. 4-5. [Eastbourne], cr. 8vo, 1873. (A list merely, without comments, and very incomplete; enumerates 57 species; a previous edition, dated 1871, not seen.)

WEAVER, J.—[Fishes in the parish of Harting.] In the Rev. H. D. Gordon's *History of Harting*, pp. 302-307. London, cr. 8vo, 1877. (Enumerates 10 species, and includes a figure and description of the largest English Carp on record.)

MERRIFIELD, Mrs.—[The Fishes of the Brighton District.] In her *Sketch of the Natural History of Brighton & its Vicinity*, pp. 97-113, 161-162, 192-193, & 224. London & Brighton, dy. 8vo, 1860.

WALES, NORTH.

EYTON, T. C.—[The Fishes] of Shropshire and North Wales. *Mag. of Zool. & Bot.*, vol. iii, pp. 24-29. Edinburgh, London, and Dublin, dy. 8vo, 1839. (A good list.)

WESTMORELAND.

GOUGH, THOS.—Fishes [of the Kendal District.] In Cornelius Nicholson's *Annals of Kendal*, 2nd ed., p. 311. Kendal and London, dy. 8vo, 1861. (Enumerates 15 species; did not appear in the 1st ed.)

BRAITHWAITE, GEO. F.—The Salmonidæ of Westmoreland [&c.]. London & Kendal, 8vo, 1884. (Reprinted from the *Westmoreland Gazette*.)

MACPHERSON, Rev. H. A.—[The Fishes of Westmoreland.] In his *Vertebrate Fauna of Lakeland*. See CUMBERLAND.

WIGHT, ISLE OF (See also HAMPSHIRE).

WARNER, Rev. RICHARD.—[The Fishes of the Isle of Wight.] In his *History of the Isle of Wight*, pp. 213-224. Southampton and London, dy. 8vo, 1795. (A very meagre list, including crustacea, &c.)

MARTIN, G. A.—[The Fishes of the Undercliff.] In his *Undercliff of the Isle of Wight*, pp. 208-226. London, post 8vo, 1849.

MORE, A. G.—Fresh-water Fishes [of the Isle of Wight.] In the Rev. E. Venable's *Guide to the Isle of Wight*, pp. 440-441. London, fcap. 8vo, 1860. (Enumerates 13 species.)

WILTSHIRE.

MATON, GEO., M.D.—[The Fishes of the Salisbury District.] In his *Natural History of a part of the County of Wilts*, p. 71. London, dy. 8vo, 1843. (Very incomplete.)

AUBREY, JOHN.—[The Fishes of Wiltshire.] In his *Natural History of Wiltshire; written between 1656 & 1691; edited by John Britton*, pp. 62-63. London, dy. 4to, 1847. (Mentions very few species.)

WORCESTERSHIRE.

HASTINGS, CHAS.—[The Fishes of Worcestershire.] In his *Illustrations of the Natural History of Worcestershire*, pp. 73-80. London & Worcester, dy. 8vo, 1834. (A rather meagre list.)

YORKSHIRE.

DENNY, HENRY.—Sketch of the [Fishes] . . . of Leeds & its Vicinity. *Annals of Nat. Hist.*, vol. v, pp. 392-394. London, dy. 8vo, 1840. (A considerable list.)

MEYNELL, T.—On the Fishes of Yorkshire. In *British Assoc. Report for 1844*, pp. 62-63. London, dy. 8vo, 1845. (Records the occurrence of 140 species.)

FERGUSON, D.—[The Fishes of the District around Redcar.] In his *Natural History of Redcar & its Neighbourhood*, pp. 110-112. London & Redcar, fcap. 8vo, 1860. (A list merely, without comments.)

CLARKE, WM. EAGLE, & W. D. ROEBUCK.—[The Fishes of Yorkshire.] In their Handbook of the *Vertebrate Fauna of Yorkshire*, pp. x-xi, xli-xliii, & 97-133. London & Leeds, dy. 8vo, 1881. (An extensive list; enumerates 148 species; additions in the *Naturalist*, vol. ix, 1884, pp. 178-176, bring up the total to 155 species.)

CLARKE, W. EAGLE, & W. D. ROEBUCK.—[The Fishes of Washburndale.] *Naturalist*, vol. ix, p. 16. Huddersfield, dy. 8vo, 1884. (Enumerates 7 species.)

CLARKE, W. EAGLE, W. D. ROEBUCK, & WM. STOREY.—[The Fishes of Upper Nidderdale.] *Naturalist*, vol. xi, p. 205. Huddersfield, dy. 8vo, 1886. (Enumerates 7 species.)

WAITE, EDGAR R.—[The Fishes of the Western Ainsty.] *The Naturalist*, 1891, pp. 111-114. London, dy. 8vo, 1891.

WOOD, C. H. B.—[The Fishes of Langstrothdale.] *The Naturalist*, 1891, p. 139. London, dy. 8vo, 1891. (Enumerates 3 species.)

SCOTLAND.

GENERAL.

PENNANT, W.—[The Fishes of Scotland.] In the Rev. J. Lightfoot's *Flora Scotica*, vol. i, pp. 51-63. London, 2 vols., dy. 8vo, 1777. (Enumerates 73 species.)

ABERDEENSHIRE.

ARBUTHNOT, JAS., jun.—Natural History of those Fishes that are indigenous to, or occasionally frequent, the Coasts of Buchan [&c.]. Aberdeen, 8vo, 1815. (A considerable list; reprinted from the Author's *Historical Account of Peterhead*, app., pp. 1-63. Aberdeen, 8vo, 1815.)

MACGILLIVRAY, Prof. W.—Fishes [of Braemar.] In his *Natural History of Deeside & Braemar*, pp. 413-416. London, dy. 8vo, 1855. (Enumerates 11 species.)

ARGYLLSHIRE.

HARVIE-BROWN, J. A., & T. E. BUCKLEY.—[The Freshwater Fishes of Argyllshire]. In their *Vertebrate Fauna of Argyll and the Inner Hebrides*, pp. 219-234. Edinburgh, fcap. 4to, 1892.

BANFFSHIRE.

W.—Contributions to the Ichthyology of Banffshire. *Naturalist* (Morris's), vol. iv, pp. 230-231; vol. v, pp. 207-210; vol. vi, pp. 229-233. London, roy. 8vo, 1854-56.

EDWARD, THOMAS.—The Fishes of Banffshire. *Naturalist* (Morris's), vol. v, pp. 1-4, 59-62, and 127-131. London, roy. 8vo, 1855. (Additions and corrections in the *Mag. of Nat. Hist. and Naturalist*, pp. 36-39. London, dy. 8vo, 1860.)

EDWARD, THOS.—Fishes [of Banffshire]. In Smiles's *Life of a Scotch Naturalist*, pp. 417-429. London, dy. 8vo, 1876. (A considerable list; a second edition, without the faunal lists, was published in 1882.)

BERWICKSHIRE.

JOHNSTON, GEO., M.D.—A List of the Fishes of Berwickshire, exclusive of the Salmones. *Hist. Berwicksh. Nat. Club*, vol. i, pp. 170-176. Edinburgh, dy. 8vo, 1834.

BUTE.

LANDSBOROUGH, J. & J., jun.—[The Fishes of Arran.] In *Arran: its Topography, Natural History & Antiquities*, pp. 381-386, and 491-492. Ardrossan and London, cr. 8vo, 1875. (A very incomplete list.)

CAITHNESS.

HARVIE-BROWN, J. A., & T. E. BUCKLEY.—[The Fishes of Caithness.] In their *Vertebrate Fauna of Sutherland, Caithness, and West Cromarty*, pp. 253-297. Edinburgh, 4to, 1887. (An extensive and admirable list.)

CROMARTY.

HARVIE-BROWN, J. A., & T. E. BUCKLEY.—[The Fishes of West Cromarty.] In their *Vertebrate Fauna of Sutherland, Caithness, and West Cromarty*, pp. 253-297. See CAITHNESS.

FORFARSHIRE.

DON, G.—[The Fishes of Forfarshire.] In the Rev. Jas. Headrick's *General View of the Agriculture of . . . Forfarshire*, app. pp. 45-47. Edinburgh & London, dy. 8vo, 1813.

HEBRIDES.

SMITH, W. ANDERSON.—[The Fishes of Lewis.] In his *Lewsiana*, pp. 233-254. London, cr. 8vo, 1875.

HARVIE-BROWN, J. A., & T. E. BUCKLEY.—[The Fishes of the Outer Hebrides.] In their *Vertebrate Fauna of the Outer Hebrides*, pp. 172-225. Edinburgh, 4to, 1888. (An extensive and admirable list, relating also to a large portion of the north-west coast of Scotland.)

HARVIE-BROWN, J. A., & T. E. BUCKLEY.—[The Freshwater Fishes of Argyllshire.] In their *Vertebrate Fauna of Argyll and the Inner Hebrides*, pp. 219-234. Edinburgh, fcap. 4to, 1892.

MIDLOTHIAN.

NEILL, PATRICK.—List of the Fishes of the Edinburgh District. In Wm. Rhind's *Excursions illustrative of the Geology & Natural History of the Environs of Edinburgh*, pp. 135-140. Edinburgh and London, dy. 8vo, 1836.

ORKNEYS.

BARRY, Rev. G.—[The Fishes of the Orkney Islands.] In his *History of the Orkney Islands*, pp. 286-297. Edinburgh and London, dy. 4to, 1805. (A very brief list, including some of the Cetacea, Mollusca, and Crustacea; reprinted *verbatim* in the 2nd ed., London, dy. 4to, 1808, pp. 293-303; also in the 3rd ed., Kirkwall, cr. 8vo, 1867, pp. 280-290.)

Low, Rev. GEORGE.—[The Fishes of Orkney.] In his *Fauna Orcadensis*, pp. 167-230. Edinburgh, dy. 4to, 1813. (A considerable list.)

BUCKLEY, T. E., & J. A. HARVIE-BROWN.—[The Fishes of the Orkney Islands.] In their *Vertebrate Fauna of the Orkney Islands*, pp. 266-296. Edinburgh, 4to, 1891. (A valuable list, but admittedly very incomplete.)

[BAIKIE, W. D., & ROBT. HEDDLE.]—[The Fishes of Orkney.] (The MS. List of Fishes which was intended to form part of their *Historia Naturalis Orcadensis* is now in the possession of Mr. J. H. Gurney.)

PEEBLESSHIRE.

[NEILL, PATRICK.]—[The Fishes of Tweeddale.] In *The Works of Alexander Pennecuik, Esq.*, p. 107. Edinburgh, &c., dy. 8vo, 1815. (Enumerates 9 species.)

CHAMBERS, W.—[The Fishes of Peeblesshire.] In his *History of Peeblesshire*, p. 528. Edinburgh & London, roy. 8vo, 1864. (Very incomplete.)

SHETLAND.

EDMONSTON, A.—[The Fishes of Shetland.] In his *View of the Ancient and Present State of the Shetland Islands*, vol. ii, pp. 302-316. Edinburgh & London, 2 vols., dy. 8vo, 1809. (An incomplete list.)

Low, Rev. GEORGE.—[The Fishes of Shetland.] In his *Fauna Orcadensis*, pp. 167-230. Edinburgh, dy. 4to, 1813. (A considerable list.)

SUTHERLANDSHIRE.

BUCKLEY, T. E., & J. A. HARVIE-BROWN.—The Fishes of Sutherland and the Moray Firth. In Chas. St. John's *Tour in Sutherlandshire*, ed. 2, vol. ii, pp. 362-374. Edinburgh and London, cr. 8vo, 1884. (An admirable list.)

HARVIE-BROWN, J. A., & T. E. BUCKLEY.—[The Fishes of Sutherland.] In their *Vertebrate Fauna of Sutherland, Caithness, & West Cromarty*, pp. 253-297. See CAITHNESS.

IRELAND.

GENERAL.

BOATE, GERARD.—Ireland's Naturall History. London, xvi-191 pp., pott 8vo, 1652. (Notwithstanding its title, this work contains nothing on the Fauna of Ireland; later editions in fcap. 4to were published in Dublin in 1726 and 1755.)

BROWNE, PATRICK, M.D.—A Catalogue of Fishes observed on our Coasts and in our Lakes and Rivers. *Exshaw's Gentleman's and London Magazine*, pp. 515-516. Dublin, 8vo, 1774.

TEMPLETON, ROBT.—[The Fishes of Ireland.] *Mag. of Nat. Hist.*, new series, vol. i, pp. 409-413. London, dy. 8vo, 1837. (A good list.)

THOMPSON, WM.—[The Fishes of Ireland.] In his *Report on the Fauna of Ireland*, in the *Report of the British Association for 1840*, pp. 384-400 & 406-409. London, dy. 8vo, 1841. (An extensive list.)

THOMPSON, WM.—[The Fishes of Ireland.] In his *Natural History of Ireland*, vol. iv, pp. 69-268. London, dy. 8vo, 1856, (An extensive and valuable list.)

ANTRIM.

BELFAST NATURALISTS' FIELD CLUB, MEMBERS OF.—[The Fishes of the Belfast District.] In their *Guide to Belfast and the Adjacent Counties*, pp. 105-110. Belfast, fcp. 8vo, 1874. (An incomplete list.)

CORK.

SMITH, CHAS.—[The Fishes of the County of Cork.] In his *Ancient and Present State of the County and City of Cork*, 2nd ed., pp. 304-324. Dublin & London, dy. 8vo, 1774. (A very incomplete list; includes the Cetacea, Crustacea, &c.)

HARVEY, Dr. J. R.—[The Fishes of the County of Cork.] In his *Contributions towards a Fauna & Flora of the County of Cork*, pp. 18-24. London & Cork, dy. 8vo, 1845. (A considerable list; enumerates 97 species.)

DOWN.

[HARRIS, WALTER.]—[The Fishes of the County Down.] In his *Ancient & Present State of the County of Down*, pp. 235-250. Dublin, dy. 8vo, 1744. (Not of much value; as to authorship, see Harting's *Essays on Sport & Natural History*, p. 313.)

BELFAST NATURALISTS' FIELD CLUB, MEMBERS OF.—[The Fishes of the Belfast District.] In their *Guide to Belfast and the Adjacent Counties*, pp. 105-110. Belfast, fcp. 8vo, 1874. (An incomplete list.)

KNOX, ALEX.—[Fishes of the County Down.] In his *History of the County Down*, pp. 655-665. Dublin, dy. 8vo, 1875. (An extensive list, but not very detailed.)

DUBLIN.

KNOX, ALEX.—[The Fishes of the County of Dublin.] In his *Essay towards a Natural History of the County of Dublin*, vol. i, pp. 345-370. Dublin, 2 vols., dy. 8vo, 1772. (A fair list for the period.)

MORE, A. G.—[The Fishes of the County Dublin.] In the *Guide to the County of Dublin, &c.*, part ii, pp. 71-77. Dublin, dy. 8vo, n. d. [1878]. (A good list, but with very brief comments.)

WEXFORD.

BARRETT-HAMILTON, G. E. N.—The Fishes of the County Wexford. To form part of his *Fauna and Flora of the County Wexford*. (In preparation.)

In reviewing the Catalogue of Fish Lists, it will be seen that they are, on the whole, by no means poor in quality nor few in number. The fishes, in fact, seem to have been studied with a considerable amount of care, which is no doubt largely due to their direct economic value as a source of food-supply. England, as in the previous catalogues, proves to have been done very much more thoroughly than Scotland or Ireland. As before, too, the counties of Cornwall, Devonshire, Durham, Norfolk, Northumberland, and Yorkshire, are shown to have received the greatest amount of attention. Many others have been done with fair fulness, but the following do not appear at all in the list:—Berkshire, Buckinghamshire, Hertfordshire, Middlesex, Monmouth, Nottingham, Suffolk, Surrey, Warwickshire, and Wiltshire. Wales, as usual, proves to have received a very small amount of attention, the only county appearing in the list being Glamorgan. Certain Scottish counties which have received the attention of Messrs. Harvie-Brown and Buckley are represented in the Catalogue by admirable lists, but the rest have been, for the most part, meagrely treated. The Catalogue of Irish Lists is short; and though it contains one or two good items, is largely made up of antiquated lists.

The author desires again to ask those who observe omissions in these Catalogues to inform him of them, so that they may be included in the intended separate reprint.

NOTES AND QUERIES.

The Centenary Anniversary of Gilbert White.—In the article which appeared under this heading in the June number of 'The Zoologist,' there is a mistake on page 205, which should be corrected. Allusion is there made to the marble bust of Richard Jefferies, "erected to his memory in Winchester Cathedral." This is a slip of the pen for Salisbury Cathedral. The Winchester monument is that of Izaak Walton.—ED.

Death of Mr. W. Reid.—Mr. W. Reid, formerly of Wick, died at Huntly Hall, Nairn, on the 27th May last. Mr. Reid was widely known to all lovers of natural science throughout the country. He was a personal friend of Frank Buckland, Harvie Brown, Buckley, and other distinguished naturalists, and was a valued contributor to 'The Field,' 'Land and Water,' 'Nature,' and other periodicals dealing with natural history. Mr. Reid was

born in Wick in 1814, but went to Kirkwall when he was twenty-two years of age, and remained there thirty years in business as a bookseller. About ten years ago Mr. Reid came to Nairn, where he has since resided. His pursuit of natural history began with the fishes, and he was regarded as one of the best authorities on that subject in the country. His residence in Orkney led him to devote more particular attention to birds, and he gave valuable assistance to Baikie and Heddle in their standard work on Orkney mammals and birds; and in the splendid volumes by J. A. Harvie Brown and T. E. Buckley, 'A Fauna of the Orkney Islands,' and 'A Fauna of Sutherland, Caithness, and West Cromarty,' mention is made in the handsomest manner of the obligations the authors were under to Mr. Reid. It was a characteristic of the deceased gentleman that he placed at the disposal of every naturalist who sought him out all the stores of his information and experience. All his desire was to further the interests of science. His letters to the various newspapers on topics connected with his favourite pursuits would make a goodly volume. His communications were invariably written in an animated, easy simple style, giving delight to all who read them from their naturalness of description no less than from the keenness of observation they showed. Besides his assistance to men of science so freely given, Mr. Reid's letters tended very much to popularise and stimulate the study of the habits of "beasts and birds" throughout the country. It is much to be regretted he never threw his observation and experiences, his lists of "finds" and discoveries, into a permanent form. Some notes he did prepare, and his numerous cuttings he preserved, but these form a very inadequate measure of the stores of knowledge he had acquired of bird-life and the habits of the denizens of the deep. Mr. Reid lived a very quiet, retired, simple life. Until a few weeks ago, he never knew what a day's ill health was. A kindlier or more unaffectedly good-hearted man never lived. Simple, upright in all his ways, and charitable in all his thoughts, he was held in respect and esteem by all who knew him. He had entered on his eightieth year, and passed away through the simple decline of his natural strength.—*Elgin Courier*.

MAMMALIA.

Distribution of the Alpine Hare in S.W. Scotland.—In the S.W. counties of Scotland it may be said that the White Hare now frequents all the hills of 1500 feet and upwards, and very many of those of lower altitude. A specimen has been shot so low down as the hill above Dalscairth. The species was unknown in Dumfriesshire previous to so comparatively recent a date as the winter of 1863, when it was first noticed on the Moffat, Evan Water, Leadhills, and other ranges leading into Peebles and Selkirkshire. It was understood at the time that these hares were the produce of some that had been turned down at Glenbuck by a Mr. Hunter about 1861.

But in 'The Mammalia of the Edinburgh District,' published a short time ago by my friend Mr. William Evans, the author shows that there were at least two other introductions to which, together with those turned out at Glenbuck, we are indebted for the present stock of Mountain Hares which are so widely and abundantly distributed over the southern uplands. Mr. Clason, of Hallyards, procured a number of Blue Hares from the north, and set them free on the top of one of the highest hills in the parish of Manor, in Peeblesshire, in 1845 or 1846. There was also another introduction on the Silverburn hills, the highest of the Pentlands, somewhere about the beginning of the sixties.—R. SERVICE (Maxwelltown, Dumfries).

Variation in the Colour of Field Voles.—It is somewhat surprising, considering the untold myriads of voles that have overrun the Scottish sheep pastures for a year or two past, that so few variations in colour have been reported. To be sure, one observer stated in a communication to the Highland and Agricultural Society's 'Transactions' that they were "of all colours," but the statement has been entirely uncorroborated, and I am afraid there was exceedingly little foundation in fact for the remark. I have not remarked any noteworthy aberration amongst those I have seen in peregrinating through their haunts, but the shepherds have reported an occasional pied example. I have, however, a very strong impression that the "hill voles" are decidedly of a more smoky tint than those to be found in the lower lands amongst the hedges and plantations. The latter seem to develop a much ruddier colour on the fur along the back, and the general tone of grey seems much brighter than that of the voles that have ravaged the upland pastures. I lately received for examination (previous to its being put into the hands of Mr. Mackay for preservation) a curious variety of the Field Vole, *Arvicola agrestis*, from Mr. R. Bramwell, Blackaddie. It is not an albino, although the fur, on a cursory examination, seems quite white from nose to tail. On blowing the fur-tips aside it is seen that only about one-fifth of the length of each hair is white, the remainder being a very pale brown or fawn, but the fur being closely set it really appears to be all white. The eyes are not pink, as in every albino, but they are much paler than the normal eyes. The whiskers and the hairs on the tail are entirely white. It would be interesting to hear of any cases of "albinism" or "melanism" in this species.—R. SERVICE (Maxwelltown, Dumfries).

[Donovan has figured an albino example of this species (Brit. Quad. pl. 48), and one was caught alive at East Bergholt, near Colchester, in November, 1872. Mr. Borrer has in his collection a very pretty variety which was captured near Horsham. It is of a uniform clear buffy white. A pied specimen of this species was caught in a clover-field at Long Cross, Chertsey, in July, 1866 (Field, July 27th, 1866). A black variety was killed in a clover-field at Blaxhall, Suffolk, June 25th, 1886 (Zool. 1886,

p. 332); and a black and white one was found near Harrogate, July 21st, 1886 (Zool. 1886, p. 485). There may be very likely other varieties which have escaped our notice.—ED.]

BIRDS.

Plumage of White's Thrush.—The question whether the accidental visitors to Europe are mostly old or young birds is of so much interest that, without wishing to prolong the discussion, I should like to correct an error in Mr. Gätke's interesting communication (p. 164). White's Thrush is so specially interesting, both to British and Heligoland ornithologists, that any facts connected with its history are worthy of record. To determine whether the nine examples which have been obtained in Heligoland are immature or adult it is necessary to ascertain how the two plumages differ. Had there been any material difference in the plumage of these nine examples, it is scarcely likely that it would have escaped the keen eye of the veteran ornithologist who has so long kept watch on the lonely island. Amongst the hundreds of skins that I have examined I find no variation in the white and black markings on the axillaries and under wing-coverts, which Mr. Gätke erroneously imagines that I suppose to indicate the adult bird. It is the peculiar *Geocichline* markings on the inner webs of the primaries which vary. In some examples, which I imagine to be adult, they are pure white; in others which I suppose to be immature, they are buff. Unfortunately the description of White's Thrush in Mr. Gätke's book does not mention the colour of these markings which are so characteristic of all the species which I include in the genus *Geocichla*; but I venture to say that they will be found on examination to be buff, and, according to my hypothesis, to indicate that the nine examples are immature.—HENRY SEEBOHM.

Richard's Pipit in Somersetshire.—On the 30th of May last I saw a pair of Richard's Pipits, *Anthus richardi*, near Lady's Bay, Clevedon. They were in a large field interspersed with patches of fern which slopes down to the Bristol Channel, and first attracted my attention from the strut and high carriage of the head which is characteristic of the male. They allowed of a near approach and close observation. It struck me as probable that they might have a nest near, but I failed to find one; nor, though I returned to the spot soon afterwards, and for several subsequent days in succession, did I see anything more of them.—MARCUS S. C. RICKARDS (Twigworth Vicarage, Gloucester).

Sheldrake and other Birds at Exmouth.—On the 27th of May I set out with the intention of discovering, if possible, whether a pair of Shelduck, which had for some time been seen in the locality, were breeding on the Warren. It was about noon when I crossed over from Exmouth, and, after

examining very carefully some rabbit-burrows without success, I saw in the distance a couple of ducks flying towards me from the river Exe. I thereupon hid myself behind a gorse-bush which was close at hand, and on the birds approaching nearer I at once saw they were the Shelduck I was in search of. They alighted on a sand-hill, which was honeycombed with rabbit-holes, about 200 yards from where I was hiding, and very soon one of them disappeared. I walked towards the spot, and when the old drake saw me he flew away. After examining all the holes carefully, I at last found one at the entrance to which, and about the sides, was a quantity of down; this, of course, I at once concluded was the hole in which I should find the nest. Putting my arm in as far as I could reach I could not feel anything, but being provided with a shrimp-rake, to use as a digger, I commenced to enlarge the hole, and after having dug a little way I again put my arm in, and this time just managed to reach the nest, which contained eleven eggs, the old bird having slipped to the other end of the hole. Several young Wheatears were popping in and out of the rabbit-holes as if having a game of hide and seek. A pair of Dunlins, in breeding plumage, allowed me to approach very near, and although I looked carefully for eggs and young I failed to see any sign of either, but should say they were evidently breeding there somewhere. I came across several Ring Plovers, and two pairs of Lapwings, which, from their cry and uneasiness at my approach, led me to believe that they also had eggs or young near. A pair of Yellow Wagtails and numerous Meadow Pipits and Sky Larks were the only other breeding birds I saw.—WM. E. HELMAN-PIDSLEY (Exeter).

Quail nesting in Sussex.—On May 31st, while cutting a field of clover in the parish of Angmering, Sussex, the nest of a Quail containing eleven fresh eggs was laid bare; they were brought to me as Landrail's eggs. I have lived in this neighbourhood for thirty years, always keeping a sharp look out for birds, but I have never before come across our little friend *Coturnix communis*.—S. V. CLARK (Angmering, Sussex).

[Mr. Borrer, in his 'Birds of Sussex' (p. 188), says of the Quail that in the few instances in which the nest has been found in the Weald, it has been in fields of wheat, clover, or grass put up for hay. Of late years Quails have not been nearly so numerous in England as was formerly the case, and we are inclined to attribute this to the enormous toll which is taken of their numbers on both sides of the Mediterranean during their migration northwards in the spring. Many hundreds would probably reach England were it not for this wholesale destruction at this season of the year.—ED.]

Spoonbill in South Hants.—On the evening of May 25th a Spoonbill, *Platalea leucorodia*, flew over my head within gunshot. It was flying in a south-westerly direction, and I could distinctly see the yellow feathers at the back of its head. I saw one here last year on the 15th of August.—JOHN STARES (Porchester, Hants).

Early Nesting of the Greater Spotted Woodpecker.—On the 9th June I observed a full-grown young Great Spotted Woodpecker, *D. major*, near here. It did not seem at all shy, and allowed me to watch it closely, for several minutes. It had all the appearance of having left the nest some time. The red on the top of the head was very conspicuous.—HORACE TERRY (Burvale, Walton-on-Thames).

Breeding of the Dunlin in Wales.—As the Dunlin, *Tringa alpina*, is known to nest in Cornwall and Devon, it is a little remarkable that the fact of its breeding in Wales has not hitherto been satisfactorily established. I found it last summer frequenting a large heather-grown peat bog in Cardiganshire, some twelve miles from the sea. When at the same locality this year, on May 13th, a small wader rose, with the Dunlin's weak note, and, shuffling along to attract attention, showed the black breast and chestnut mantle of that bird. The four eggs were typical Dunlin's eggs, smaller than those of the Snipe, and with greener ground colour. Another pair, on May 24th, evidently had young ones hidden amongst the rushes, and must have bred in the neighbouring peat-mosses.—J. H. SALTER (University College, Aberystwith).

Grasshopper Warbler near Brecon.—I have this season been lucky enough to find two nests of the Grasshopper Warbler here, in both cases by flushing the bird. The first nest, an early one, contained on May 31st, six young birds, about a week old. Having been, so far, unable to obtain an adult specimen of this species, I took two of these nestlings and had them preserved. The second nest was a very late one, and on June 9th contained five fresh eggs—a handsome clutch, with an unusual amount of pink colouring. I have kept this nest, as it differs from any I have seen before, the outside being composed almost entirely of moss. In those I have previously found, including one now in the Natural History Museum, the outside has been made mostly of coarse herbage.—E. A. SWAINSON (Brecon).

Newly observed Habit of the Blackcap.—In my communication under this heading (pp. 169—172), I referred to the visits of this bird to flowers of a pink variety of *Hibiscus*, which I took to be *Hibiscus africanus*, but which I now find to be *H. rosa-sinensis*. It may be well to publish the correction.—JOHN LOWE, M.D. (4, Gloucester Place, Portman Square).

Garganey in Sussex.—Allow me to correct a printer's error in my notice of this bird (p. 226). The locality should be Little Common, near Bexhill, not "South Common, near Box Hill."—GEORGE W. BRADSHAW (Hastings). [In order to avoid mistakes such as these, it would be well if correspondents would write names of persons and places as legibly as possible.—ED.]

FISHES.

Basking Shark on Coast of Sligo.—On June 5th a specimen of the Basking Shark, *Selachus maximus*, became entangled in the salmon-net of Mr. Kilgallen, at Aughriss, Co. Sligo, a short distance off the pier; and after a desperate struggle, in which it caused great damage to the net and ropes, was, by the united efforts of four boats, towed into shallow water on the sandy beach, where it was killed. This great fish was evidently a full-grown specimen, for it measured thirty feet in length.—ROBERT WARREN (Moyview, Ballina).

 SCIENTIFIC SOCIETIES.

LINNEAN SOCIETY OF LONDON.

June 1, 1893.—Prof. STEWART, President, in the chair.

Mr. F. H. Leslie was admitted; and Messrs. R. Assheton, W. G. Oxford, J. Gabriel, and W. H. Wager were elected.

Dr. J. Lowe gave an account of a newly observed habit of the Blackcap, *Sylvia atricapilla*, in puncturing the petals of certain flowers (*Hibiscus rosa-sinensis* and *Abutilon frondosus*), specimens of which he exhibited, thus causing the exudation of a viscid secretion which proved attractive to insects upon which the bird preyed. The observations in question were made at Orotava, Teneriffe, during the month of March last (see p. 169).

By way of introduction to a paper by Mr. W. B. Hemsley on Polynesian plants collected by Mr. J. J. Lister, the latter gave an interesting account of the geology of the Tonga Islands, their volcanic nature, and the coral and limestone reefs with the soil formed chiefly of volcanic outpourings in which dense patches of bush were growing. Referring then to the bird-fauna of the Tonga group, Mr. Lister compared it with that of Fiji and Samoa, and showed that it had no special affinity with the avifauna of New Zealand, and exhibited very little specialization. Mr. Hemsley then gave an account of the plants collected there, as also in the Soloman Islands.

Mr. A. B. Rendle gave an abstract of a paper on fossil palms, in which his remarks were directed to a revision of the genus *Nipadites*, Bowerbank, and were illustrated by drawings of specimens from the London Clay, Sheppey, from the Sussex coast, Selsey, Brussels, N.E. Italy, and elsewhere. The paper was criticised by Mr. Carruthers, and by Mr. Clement Reid, who described the finding of specimens *in situ* at Selsey.

The Secretary then read a paper by Dr. Baur on the temperature of trees from observations taken in Colorado.

Mr. W. M. Webb gave an abstract of a paper on the mode of feeding in *Testacella*, illustrated by lantern slides prepared from original drawings of the living animal in various attitudes.

June 15.—Professor STEWART, President, in the chair.

Mr. Lewis Ough was admitted, and Messrs. F. J. Jackson and H. H. Johnston were elected Fellows.

Mr. A. W. Bennett exhibited some curious examples of revivification in plants, and made some remarks on the tentacles of *Drosera rotundifolia* and *longifolia*, specimens of which were exhibited under the microscope.

Dr. Stapf read a paper on the Botany of Mount Kina Balu, North Borneo, and exhibited some of the most characteristic plants. His remarks were criticised by Mr. W. T. Thiselton Dyer, who regarded the paper as a valuable contribution to geographical botany.

Prof. W. A. Herdman, in continuation of a former paper printed in the Society's Journal, gave an interesting account of several species of British *Tunicata*, some of which were previously undescribed, his remarks being illustrated by figures projected on the screen by means of the oxy-hydrogen lantern.

On behalf of Miss A. L. Smith, Mr. George Murray gave an abstract of a paper on the anatomy of a plant brought from Senegambia by Mr. G. F. Scott Elliot, the affinities of which had not been precisely determined, but which was referred either to the *Melastomacæ* or *Gentianacæ*. The author's views, which were illustrated by means of the oxy-hydrogen lantern, were criticised by Dr. D. H. Scott.

In the absence of Mr. Scott Elliot, a paper was read, on his behalf, by the Secretary on the African species of the genus *Ficus*.

Prof. F. W. Oliver, on behalf of Miss M. Benson, gave an abstract of a paper entitled "Contributions to the Embryology of the *Amentifera*," illustrated by diagrams of sections made by the author.

With this meeting the session of 1892-93 was brought to a close.

ZOOLOGICAL SOCIETY OF LONDON.

June 6, 1893.—Sir W. H. FLOWER, K.C.B., F.R.S., President, in the chair.

The Secretary read a report on the additions that had been made to the Society's Menagerie during the month of May, and called special attention to a young Water Buck, *Cobus ellipsiprymnus*, born May 4th, being, so far as is known, the first Antelope of this species that has been bred in captivity.

Mr. Walter Rothschild exhibited and made remarks on an egg of the Duckbill, *Ornithorhynchus anatinus*, taken from the pouch of the mother;

the leg-bones and egg of an extinct bird of the genus *Æpyornis* from South-West Madagascar; and a series of Lepidopterous Insects from Jamaica and from the Bolivian Andes.

Mr. Sclater exhibited and made remarks on some skins and skulls of Mammals obtained in the Shiré Highlands by Mr. H. H. Johnston, Mr. B. L. Sclater, Messrs. Buchanan, and Mr. Alexander Whyte.

A communication was read from Messrs. F. E. Beddard and F. G. Parsons, containing notes on the anatomy and classification of the Parrots, based on specimens lately living in the Society's Gardens.

Mr. Sclater called attention to two front horns of an African Rhinoceros belonging to Mr. F. Holmwood, which were stated to have been brought by native caravans from the district of East Africa, south of Lake Victoria Nyanza. They were remarkable for their great length and extreme thinness.

A communication was read from Mr. R. Lydekker, containing an account of a collection of bird-bones from the Miocene Deposits of St. Alban, in the Department of Isère, France. The more perfect specimens were referred mostly to new species,—*Strix sancti-albani*, *Palæortyx maxima*, *P. grivensis*, and *Totanus majori*,—while others were regarded as undeterminable from their fragmentary condition.

Mr. G. A. Boulenger read a paper describing some new species of Reptiles and Batrachians, based on specimens lately obtained in Borneo by Mr. A. Everett and Mr. C. Hose.

June 20.—Sir W. H. FLOWER, K.C.B., F.R.S., President, in the chair.

The Secretary exhibited and made remarks on two eggs of the Cape Coly, *Colius capensis*, laid in the Society's Gardens.

Mr. Walter Rothschild exhibited and made remarks on a head of a Rhinoceros from Northern Somali-land; a Caspian Seal, believed to be the only specimen of this Seal in England; and a series of skins of Parrots of the genus *Cyanorhamphus* from New Zealand and other islands of the South Pacific. Mr. Rothschild proposed to refer the specimens of this group from the Auckland Islands to a new species to be called *C. forbesi*.

Mr. W. Bateson exhibited and made remarks on a specimen of the foot of a Calf, in which there were three toes springing from a single cannon-bone.

Mr. A. Smith-Woodward exhibited and made remarks on some teeth of a Ray (*Myliobatis*) from the Lower Tertiaries of Egypt, remarkable for their enormous size.

Extracts were read from a letter addressed to the Secretary by Mr. F. E. Blaauw on the breeding of the Ypecaha Rail, *Aramides ypecaha*, and Darwin's Rhea, *Rhea darwini*, in his aviaries in Holland.

Dr. Forsyth-Major exhibited and made remarks on a fragmentary skull

of a Lemuroid Mammal from S.E. Madagascar with very remarkable characters.

A communication was read from Messrs. Hamilton H. Druce and G. T. Bethune-Baker, containing a monograph of the Butterflies of the genus *Thysonotis*. This included a revision of the synonymy of the species, descriptions of several new species and varieties, a complete table showing the distribution of the genus, and descriptions of the genitalia.

A communication was read from Miss E. M. Sharpe, containing descriptions of some new species of Butterflies from the Island of St. Thomas, W. Africa.

Mr. A. Smith-Woodward gave an account of the cranial osteology of the Mesozoic Ganoid fish, *Lepidotus*.

A communication was read from Hofrath C. Brunner v. Wattenwyl, giving an account of a collection of Orthopterous Insects from the island of Grenada, West Indies.

A communication from the Rev. H. S. Gorham contained a list of the Coleoptera of the family *Cleridæ* collected by Mr. Doherty in Burmah and Northern India, with descriptions of new species; and an account of some species of the same family from Borneo, Perak, and other localities, in the collection of Mr. Alexander Fry. Twenty-eight species were described as new.

Messrs. C. Davies Sherborn and B. B. Woodward read a list of the dates of the publication of the separate parts of the zoological portions of the 'Encyclopédie Méthodique.'

Mr. G. A. Boulenger gave an account of a new European Viper, *Vipera rakosiensis*, from Austria and Hungary.

Prof. G. B. Howes read a paper on the coracoid of the Terrestrial Vertebrates. Prof. Howes first spoke of the terminology of the bone commonly called "the coracoid," and then proceeded to the discussion of the Mammalian Coracoid in particular. He came to the conclusion that it would be best to call the whole ventral coracoidal bar the "coracoid," and to distinguish the doubly ossified type as "bioracoidal" from the singly ossified or "unicoracoidal" type.

Lieut.-Col. H. H. Godwin-Austen read the descriptions of some new species of Land-shells of the genus *Alycæus* from the Khasi and Naga Hill countries, Assam, Munipur, and the Ruby Mine district, Upper Burmah.

This meeting closed the present Session.—P. L. SCLATER, *Secretary*.

ENTOMOLOGICAL SOCIETY OF LONDON.

June 7, 1893.—H. J. ELWES, Esq., F.L.S., F.Z.S., President, in the chair.

Mr. George Willis Kirkaldy, of St. Abbs, Worplesdon, Wimbledon, S.W., was elected a Fellow of the Society.

ZOOLOGIST.—JULY, 1893.

Mr. W. C. Boyd exhibited varieties of *Fidonia piniaria* and *Thecla rubi*, taken at Bournemouth on May 20th, 1893.

Mr. C. O. Waterhouse exhibited certain large galls on oak-leaves from Mexico, one of which was apparently produced by a species of *Cynipidæ*.

Mr. A. Cowper Field exhibited varieties of *Smerinthus tilia*, bred between 1890 and 1893, under varying conditions of temperature, those which had been exposed to a lower temperature being much darker than those which had been exposed to a higher. Mr. Merrifield made some observations on the subject, and remarked that, as far as his experience went, no hard and fast rule could be laid down with regard to the production of the lighter or darker colourings, as a high temperature sometimes produced dark forms.

Mr. W. M. Christy exhibited a series of *Zygæna trifolii*, including very many yellow forms, all, with one exception, taken at one spot during the latter half of May, 1893, and belonging to one colony. Some of the specimens were more or less incomplete, both in structure and colour. Lord Walsingham, Mr. Merrifield, and others took part in the discussion which followed.

Canon Fowler exhibited cocoons and specimens of *Coniatus suavis* var. *chrysochlora*, Luc., taken by Lord Walsingham in great abundance on the flower-shoots of tamarisk in the West of Italy.

Mr. Chitty exhibited black varieties of the following Coleoptera from the slopes of Ben Cruachan, N.B.:—*Carabus violaceus* and *arvensis*, *Pterostichus versicolor*, *Phyllopertha horticola*, and *Telephorus figuratus*, and stated that the latter seemed a permanent race, as it occurred both in 1892 and 1893.

The President remarked on the great abundance of *Coleophora laricella* in Gloucestershire, and stated that they were committing great ravages among young larches. Lord Walsingham stated that he had seen young larches at Carlsbad completely bleached by this moth.

It was suggested by several Fellows of the Society that care should be taken to observe the occurrence of second broods of insects during the year.

Mons. Wailly exhibited a collection of Lepidoptera, Coleoptera, and Orthoptera from New Zealand. A discussion followed, in which Lord Walsingham, Dr. Sharp, Mr. McLachlan, Mr. Durrant and others took part.

Mons. Wailly further exhibited cocoons of various silk-producing Lepidoptera, and stated that the larva of *Attacus pernyi*, whose food-plant is oak, had been reared in Trinidad on *Terminalia latifolia*. — W. W. FOWLER, *Hon. Secretary*.

NOTICES OF NEW BOOKS.

Eléments d'Anatomie Comparée. Par RÉMY PERRIER. Two vols. 8vo, 1208 pp., with illustrations. Paris: J. Baillière et Fils. 1892.

THE greater part of this book is apportioned to the Invertebrata, as the fashion of the day would lead us to suspect; but some 400 pp. are given over to the Vertebrata. Each of the first twelve chapters is devoted to a consideration of some one or more great groups, and the remaining nine embody a more definitely organological treatment of the Vertebrates alone. The bulk of each of the first series and the first of the last series is in each case preceded by a classificatory review in tabular form; and the more general consideration of broader affinities and genetic relationships are in all cases relegated to conclusions in small type. We heartily approve of this method. The order of presentation appears at first sight somewhat capricious, for while the Mesozoa are telescoped in between the Protozoa and Porifera, and the Echinodermata follow the Cœlenterata, the Arthropoda and Brachiopoda stand at opposite ends of a series, linked together by the Nemathelminthes, Rotifera, Bryozoa, and Chætopods (with the Gephyrea and Hirudinea), and followed by the Platyhelminthes. For the treatment of the Arthropoda before the Segmented Worms there is much to be said, and the position of the Brachiopoda in the author's scheme is explained by his having adopted the view that segmentation of their larvæ implies their origin from segmental animals. Protospongia and Mago-sphæra are swallowed outright, but the author is fortunate in discussing the affinities of certain of the more difficult groups. The arguments involved in this or that notion of the relationships of the Porifera, Mesozoa, and Gigantostroaca, are set forth in lucid and unbiassed terms, and although the author is prone to hint at definite opinions, he never forces his hand in favour of either his own or anyone else's extreme views. The hypotheses which would point to a possible relationship between the respiratory organs of *Limulus* and Arachnids are duly recognised, but the Gigantostroaca, with *Limulus*, are retained among the Crustacea; and we similarly find *Rhabdopleura*, *Cephalo-*

discus, and Phoronis occupying a befitting position approximate to the Bryozoa.

The author is up to date in much of his information, and the context of his book shows him to have consulted the original literature first hand—his work being no mere reprint of scrappy abstracts. He has been much beholden to other recent text-books, notably that of Lang. The task of compiling a general Text-Book of Comparative Anatomy is to-day so formidable that inequalities are to be expected in the product, and the work before us is no exception in this respect. The classification of the Tunicata is, for example, very antiquated and insufficient, and the chapter on Amphioxus, that “next to man the most important vertebrate” is altogether behind the times. Had the author freed himself from the trammels of von Lendenfeldism his chapter on the Porifera would not have suffered; and his book is none the better for the incorporation of certain drawings and descriptions of Paul Girod, many of which are bad, and misleading; had he gone to the originals which inspired these he would have fared better. The weakest portions of the work are those dealing with histology and development, especially the former; and while many of the illustrative figures are of an altogether antiquated type, the section of an ovary (p. 1156) may be cited as one of many that are bad. The schematic figures of the nasal organs of vertebrates (p. 1101) defy description, and the arrangement which does duty (p. 844) for a transverse section of a long bone may be perhaps approximately defined as a kind of cross between a design for a bad chromatrope and a nightmare in dendritics. There are intercalated with the text a series of eight coloured plates, chiefly depicting the circulatory system of members of the great classes, and for these the author acknowledges his indebtedness to MM. Paul Méry and Richard. They are by no means so original as is implied; some of them are downright slipshod, and a curious omission occurs in the non-representation of the arterial supply to the alimentary tract of those vertebrates dealt with. We fear that the author’s comment that “all the world will appreciate the care and skill with which they are executed” will hardly be taken as he desires it to be.

Much labour has been bestowed upon the book, as is at once evident from the Introduction, which deals with fundamental principles. The author falls in with the Neo-Lamarckian school,

being favourable to the belief in the influence of the environment as the essential factor in the transformation of living organisms, and in the intervention of natural selection for the fixation and limitation of species. He might have done worse. His book cannot fail to be of service to the French student. It teaches him that distinguished workers in Zoology are not all of his own nationality, and it presents him with a well-balanced and workable *resumé* of current knowledge, free from bias. We wish it success and a speedy passage into a second edition, which, if called for, must be a much emended one. G. B. H.

L'Evolution et l'Origine des Espèces. Par T. H. HUXLEY, F.R.S., &c. Avec une Preface de l'Auteur pour l'Edition Française. Sm. 8vo, pp. 344, avec 20 figures. Paris: Baillièrre et Fils.

THIS is one of the volumes of the useful series published by Messrs. Baillièrre, under the title 'Bibliothèque Scientifique Contemporaine,' several of which were reviewed in 'The Zoologist' for June, 1891. It consists of a translation of the collected Essays of Professor Huxley on Evolution and the Origin of Species, published between 1860 and 1887, in which the writers' aim has been to popularise Darwinism and the general theory of Evolution, to remove misconceptions, and to refute errors of interpretation.

These essays in their English dress are too well known in this country to call for any particular comment *à propos* of the appearance of a French translation; but we may note the remark in the author's preface that in regard to the essays published between 1860 and 1876 he has found nothing to modify in any of the arguments which he then employed, and has not advanced therein a single proposition which has not since been shown to have been well founded. He considers that Palæontology has now established beyond doubt the evolution of organic life, and that the Darwinian theory is concerned not so much with evolution in general, as with the causes which have determined the grouping of organisms in species. He holds, as he has held for the last thirty years, that the Darwinian hypothesis enables the collation and explanation of a mass of biological phenomena, and has not been shown to be incompatible with observed facts; but he maintains, as he did in his first published essay on this

subject, that, taking the facts as they are, it is not absolutely proved that a group of animals having all the characters exhibited by species in nature has ever arisen by selection either natural or artificial. What is still wanting is direct evidence that selection is capable of originating in species races which exhibit at the time of interbreeding any sign of sterility.

It is satisfactory to find that the author sees no reason to complain of his views being misrepresented by his translator, M. Henri de Varigny, but that, on the contrary, the latter has exhibited much skill in the French reproduction of these essays.

L'Amateur d'Oiseaux de Volière: Espèces indigènes et exotiques.

Par HENRI MOREAU. Sm. 8vo, pp. 430; avec 51 figures.
Paris: Baillière et Fils.

SINCE 1795, when Bechstein published his German work on cage-birds, which has been translated into French, English, and other languages, a great number of books on this subject have appeared, though very few have approached it in merit.

Vieillot, in his 'Histoire des Oiseaux Chanteurs' (1805), was somewhat in advance of his time in regard to the instructions which he gave for the treatment in captivity of the exotic *Passeres*, particularly the Finches; and 'Die Ausländischen Sing-vögel' of Reichenbach, with its coloured plates and the Latin, German, French, and English names, is a useful book of reference so far as it goes. The date of its publication, although the volume lies before us, we have not been able to ascertain. There is no date on the title-page, and none of the catalogues to which we have referred give the desired information.

The Germans, as everyone knows, are great lovers of cage-birds, and the best books on the subject have emanated from German authors. Besides the works of Bechstein and Reichenbach, already mentioned, there is Brehm's 'Gefangene Vogel,' in two vols., 1871-76; the work of the brothers Adolf and Karl Müller, 'Gefangenleben der besten einheimischen Singvögel' (1871), and the 'Handbuch für Vogelliebhaber' (1873), and 'Die Fremdländischen Vogel, ihre naturgeschichte Pflege und Zucht' (1877), by Dr. Karl Russ.

The Italians, from the time of Olina, whose 'Uccelleria' was printed in 1622, seem to have been bird-catchers rather than bird-

fanciers; the directions given in their book relates to netting and snaring birds for the table rather than for the aviary; and they eat song-birds as they would eat quails. In this respect they resemble the French, who also eat anything that comes to their net. Nevertheless, a goodly list might be made of French books dealing with song-birds and their treatment in captivity.

The volume before us by M. Henri Moreau has not much to recommend it to English readers, and has many shortcomings. The omission of the English names might be pardoned if the author had given his authorities for the Latin names he employs, many of which are misleading. For example, we open the book at random at p. 190, and find the species there dealt with is "Le moineau de Gould, ou le Clœbé (sic), *Spermestes Gouldiæ*." It is not a "Sparrow," but a "Grass-finch," and was first described by Gould in the 'Proceedings of the Zoological Society,' under the name *Amadina gouldiæ*. Subsequently, in his folio work on the Birds of Australia, he named it *Poephila gouldiæ*, and we may search the Index to his 'Handbook' in vain for the generic name *Spermestes*. The second French name which our author writes, *Clœbé*, is puzzling to any reader who does not happen to be acquainted with the generic name *Chloebia* proposed by Reichenbach. Then again, the illustration which on the opposite page does duty for a figure of this species is that of the long-tailed *mirabilis*, which our author designates by the hybrid name, *le Diamant mirabilis*, thus confusing the Diamond-birds with the Grass-finches.

The illustrations are not satisfactory, many of them, like the Wagtail (p. 111) and the Sky Lark (p. 425), being very coarsely drawn and engraved; while some of the most easily procurable species, like the common Linnet (p. 83), are so badly done as to be unrecognisable.

The text seems to be more of a compilation than an original treatise based upon personal observation and experience, and on this account is open to objection. A book of this kind is not good enough for the requirements of bird-fanciers at the present day. What we should like to see would be a manual upon the plan of Bechstein's, giving the English, French, German, and Latin names for all the species, and including the cage-birds which have been discovered and described since Bechstein's day. At present we know nothing better than the English edition of

Bechstein's 'Natural History of Cage-birds,' which was published in 1838, and which, if we mistake not, was edited by that excellent ornithologist, the late Edward Blyth. It was issued by Orr & Co., by whom Blyth's edition of White's 'Selborne' was published in 1836, and a comparison of these two volumes shows that many of the woodcuts in both are identical.

La Pêche et les Poissons des Eaux douces. Par ARNOULD LOCARD.
Sm. 8vo, pp. 352, avec figures. Paris: Baillièrè et Fils.

IN 'The Zoologist' for 1891 (p. 239) we briefly noticed a volume by M. Locard on Oysters and Edible Molluscs, which was issued in the series "Bibliothèque Scientifique Contemporaine." In this series another volume by the same author has lately appeared on Fish and Fishing in fresh water. The book is in two parts; the first being devoted to descriptions of species, with figures of many of them; the second part dealing with the various methods employed for capturing them by means of hook and line, nets, trawls, baskets, pots, and other engines, together with descriptions of the various baits recommended.

In the first part the classification adopted is that of M. Emile Blanchard in his larger and more important work, 'Les Poissons des Eaux douces de France.' The descriptions are brief, but the author claims that they are sufficient to enable a recognition of each species, and the figures, which in many cases accompany the descriptions, are fairly characteristic.

We do not find much that is new in this manual, and the last chapter on legislation is applicable only to France. It will doubtless serve the purpose for which it is intended as one of a series of instructive handbooks, but its utility would have been greater if the author had prepared an Introduction on Classification, and furnished a good Index. It is true there is a "Table des Matières" at the end of the volume, but this is insufficient when an uninformed reader desires information on a particular subject, and knows not where to look for it.



W.J. Webb del ad nat

West, Newman imp

The manner of feeding in Testacella Scutulum.

THE ZOOLOGIST.

THIRD SERIES.

VOL. XVII.]

AUGUST, 1893.

[No. 200.

ON THE MANNER OF FEEDING IN *TESTACELLA SCUTULUM*.

BY WILFRED MARK WEBB, F.L.S.

Demonstrator in Biology to the Essex County Council.

PLATE I.

THE members of the genus *Testacella* rank among the most highly specialized forms that come under the heading of pulmonate gastropoda, and the two most interesting and at the same time most important conditions of life to which their specialization adapts these slugs, are an underground habitat, and a dietary of earthworms.

A body tapering from behind forwards assists the passage of the creature through the soil, and a very small shell protects the heart, kidneys, and breathing-chamber, which are situated at the extreme end posteriorly, while the fact that the main part of the animal lies in front of the shell, being the morphological equivalent of the anterior and retractile portion in *Limax* and *Helix*, gives considerable play to the greatly developed muscles of the alimentary system which are concerned in seizing and swallowing a living prey.

Most authors dismiss *Testacella* with the mere mention of its carnivorous propensities and nocturnal habits, while others give more or less discursive and varying accounts of the way in which it feeds. The object of this paper is to record the results of some experiments recently made by the present writer, which though not tending to confirm some of the poetical statements

included in the following quotations will carry others into greater detail.

Sixty years before Cuvier constituted the genus *Testacella*, du Gué* called attention to one of the species afterwards included in it, and to the fact that it lived on earthworms, stating with regard to a specimen that he had:—"It has been kept in a pot with some earthworms three or four inches long and as thick as a pen; it feeds on them, though much less strong in appearance. It occupied four or five hours in swallowing one entirely, but did not risk losing its prey during this long time. When once it has seized it by one end it cannot afterwards escape, no matter what efforts it may make." He adds that the species only goes out at night.

The Vicomte de Querhoent† wrote a letter describing a slug which his gardener found one night after it had half-swallowed a large worm. The slug was partly imbedded in the earth, and the worm was pulled out with it.

The action of *Testacella* is likened by Faure-Biguet‡ to that of a serpent swallowing whole an animal larger than itself, though this peculiar point is noticeable—namely, that the slug only continues to swallow the worm as the part already taken in is digested, the portion which remains outside continuing to show signs of life as long as it is to be seen.

When describing *Testacella scutulum* for the first time, G. B. Sowerby§ expresses his surprise that "an animal so extremely sluggish in its movements, after discovering its prey by means of its tentacles, by thrusting from its large mouth its white crenellated revolute tongue, should instantly seize upon and retain an earthworm of much greater size and apparent force than itself, which by its utmost exertions is unable to escape."

In 1840 an addition was made to the facts already set down,

* "Lettre à Réaumur sur la *Testacelle*," Hist. Acad. Sci. Paris Obs. Phys. Gen. art. I. p. 1 (1740).

† Quoted by Valmont-Bomare, Dict. d'Hist. Nat., 4e ed. tom. 4, p. 579 (1791). This reference not checked.

‡ "Sur une nouvelle espèce de *Testacelle*," Bull. Sci. Soc. Philomat, Paris, vol. iii. (an. x., 1802), p. 98.

§ 'Genera of Recent and Fossil Shells,' letterpress to Plate 159 (1820—25).

Cantraine* also pointed out that the lingual mass can be protruded, adding that it is covered with rows of long and recurved teeth like a carding-comb.

George Johnson, † in his 'Conchology,' a work that is somewhat overlooked, describes the buccal apparatus as a proboscis, the hold of which on the worm is assisted by bristles which are set upon it. He quotes Sowerby, and is but little in advance of the latter and Cantraine.

Moquin-Tandon, ‡ in mentioning the subject gives a reference to du Gué's observations, and alludes also to Querhoent.

In their monograph on the genus, Gassies and Fischer§ give valuable references to the literature of the subject, and a long account moreover of the habits of *Testacella*. They state that the *Testacella* moves slowly to the side of the worm, with "so complete an indifference that one might suppose it had not observed and disdained it;" but, they continue, "while the worm is turning to the left and to the right the former draws in its head, retracts its tentacles, suddenly turns, enormously dilating its mouth, and throws itself on its prey, partly swallowing it by suction." The anterior end is expressly mentioned as the one by which the worm is caught, though sometimes, according to these authors, the middle may be the part seized. A figure is given of *Testacella maugei* in contact with this part of a worm. No very definite idea of a protrusile organ is given, while the animal, which has hitherto been considered sluggish, throws itself upon its prey and enfixes it by a kind of suction, yet nevertheless the palate spines are more exactly described as having barbs.

The well-known English conchologist, the late Dr. Gwyn Jeffreys, || has devoted more space than most writers to discussing the habits of *Testacella*. He combines most of the previous accounts, adding a few artistic touches of his own, which do not tend to make matters clearer. He says:—"It is scarcely inferior

* Malacol. Méditer. (1840), p. 97.

† 'Introduction to Conchology' (1850), p. 313.

‡ 'Histoire naturelle de Mollusques terrestres et fluviatiles de France' (1855), vol. ii. p. 38.

§ "Monographie du genre *Testacelle*," Actes Linn. Soc. Bordeaux, xxi. p. 218, pl. 2.

|| 'British Conchology' (1862), vol. i. p. 142.

to the tiger, snake, or shark in its cunning and ferocity. Its prey chiefly consists of earth-worms which it hunts underground, and pursues through their galleries, crouching occasionally and making a spring on its victim. It is said that when the poor worm has had the start of its pursuer the snail-slug intercepts it by tunnelling across the line of its retreat. It will devour a lob-worm much larger than itself, seizing it in the middle, and when the writhings have been succeeded by exhaustion, it detaches and swallows one-half of the worm, and after that has been digested it finishes its long meal with the other portion. For this purpose the mouth is furnished with sharp recurved teeth, which enable the *Testacella* to retain a firm hold of its victim and swallow it more easily. The worm is provided with some means of defence in the rows of stiff bristles which encircle its rings, and by contracting its body a short respite is gained. But the chance of ultimate escape or safety is very slight. When the *Testacella* sees or scents its prey, it glides softly and cautiously towards it, and apparently without taking any notice of the worm, it seems to feel its way, and usually succeeds in fastening itself on an unprotected part of the body between the ring. The attack if unsuccessful at first is renewed, but if the worm resists too long the *Testacella* gets impatient, and by pressing or doubling its victim into the earth, by means of which the rings are forced open, its purpose is effected and the meal secured." The idea that the slug detaches half the worm does not seem to be supported by facts. Fèrussac* certainly does say, apparently following Faure-Biguet, that half the worm is inside, half out, but does not intend to give the impression that the halves are separate. The meaning of the last statement in Jeffreys' account, if taken by itself, would be a difficult matter to determine, for if the attack, as stated, were unsuccessful, by what means could the *Testacella* hold a startled worm while pressing it into the earth? But, if we refer again to Gassies and Fischer, where they describe the *Testacella*, the following passage will be found:—"Si elles ne réussissent pas du premier coup, elles font glisser peu à peu le corps de l'animal jusqu'à ce qu'elles soient arrivées à leur but, mais si le ver résiste trop, elles plongent la

* 'Histoire Naturelle des Mollusques' (1811—32), vol. ii. p. 92.

tête dans la terre, et le ployant en deux parties suivant chaque côté de leurs corps elles le dévorent en sureté."

Lovell Reeve* quotes du Gué and Gassies, but the passage from the latter is abridged.

A short description, but one to the point, is given by Paul Fischer†:—"They pursue *Lumbrici* by excavating subterranean galleries, and in order to seize them they dilate their buccal orifice, and protrude the lingual bulb covered with teeth in the form of fish-hooks."

Tryon, in his 'Manual of Conchology,'‡ quotes Jeffreys' account in full.

The following is given by H. de Lacaze-Duthiers§:—"The proceedings of *Testacella* are the results of its habits—in fact, it feeds entirely on earthworms; the latter are extremely lively, and retreat into their burrows with great agility at the slightest alarm; in the evening, when they only come out a few centimetres, the *Testacella* must seize them by no less rapidly darting at them with its tongue. If it wishes to spear its prey, it must pursue it, and therefore elongate itself in order to be able to penetrate into the worm's hole. The worm, sometimes held merely by a few of the hooks on its enemy's tongue, draws back, clinging by the aid of its setæ to the walls of its home, and drags its voracious pursuer with it; it is then a necessity for the *Testacella* to extend itself and follow its victim in order to seize it more completely."

The idea of pursuit is still kept up, and the reasons why the slug elongates itself are a trifle involved and incomplete, while no more detailed description of the action is given than in the case of previous writers.

Three species of *Testacella* have been found in the British Isles—to wit, *T. haliotoidea*, Drap., *T. maugéi*, Ferus., and *T. scutulum*, Sowerby, though the claims of the third to be considered a distinct species are not yet fully recognised. This question will be dealt with further on, insomuch as this is the species with which my experiments were made.

* 'British Land and Freshwater Mollusks' (1863), pp. 28, 31.

† 'Manuel de Conchyliologie' (1883), p. 450.

‡ Vol. iii. p. 11 (1884).

§ "Histoire de la *Testacelle*," Archives Zoologie Expérimentale, series 2, vol. v. (1887), p. 466.

Several fine specimens were found by Mr. H. C. Snell in an old asparagus bed at Buckhurst Hill, and exhibited at a meeting of the Essex Field Club* by the Secretary, Mr. William Cole, who very kindly forwarded them to the present writer. One of these slugs was laid on the damp surface of an old inverted flower-pot saucer, and after a short time the animal extended itself more or less completely (Plate I., figs. 1 and 2). An earthworm was so placed that in the course of its progress it came into contact with the anterior end of the slug. The result of the stimulus was to make the *Testacella* draw in its tentacles and head, and assume somewhat the position shown in fig. 3, where a broad and more or less vertical front is exposed. Other stimuli, as might well be imagined, such as the application of a finger or paint-brush, may have the same effect. If when such a stage has been reached the stimulus be gently continued, as it would be by allowing the worm to crawl up the slug's front, in the centre of which a slight depression above the orifice of the mouth seems to allow of an easier ascent, the tongue-like cartilage which carries the radula may be suddenly, and in the first instance unexpectedly, shot out, the mouth opening to allow of its protrusion (fig. 3).

While the writer was cleaning a specimen of *T. maugei*, which was kindly sent to him, among others, by Mr. F. W. Moore, of the Royal Botanic Gardens, Glasnevin, a drop of cold water fell from the tap on to the front of the slug, which immediately protruded its radula. The apparatus, which is milky white, appears somewhat spoon-shaped looking at it from above (fig. 3 *a*), but broader at the free extremity where there is a slight depression, and as it comes to its limit of extension, the edges, as it were, of the spoon bend upwards and inwards, making the hollow deeper and at the same time narrower.

The radula, or lingual ribbon, which follows the general form of the strong basal cartilage, curling over its edges in front and at the sides, is studded with a great number of chitinous "teeth" arranged in rows; these are placed in such a position that in the hollow of the cartilage the barbed shafts (figs. 6 *a*, 6 *b*), of which they mainly consist, all point towards the mouth of the animal, while where the rows follow the ribbon over the outer sides of the cartilage, they are larger (fig. 6) and directed upwards.

* 'Essex Naturalist,' vol. vii. (1893), p. 46.

The movements described above have the following effect on the teeth:—The protrusion of the basal cartilage tightens the radula, especially as it passes over the edges of its support, and as these approximate, the teeth on the outside stand more erect, and those on the edge bend inwards and overhang their companions in the hollow, with their barbs pointing to those of the other side (fig. 3 *a*). Thus an action is effected resembling that of the steel jaws of a spring-trap.

If the body of an earthworm be within reach of any of the barbs, it is pierced and held, but when the two series along the edges of the radula grip it, the body of the worm gets forced into the hollow, and caught on the more hidden points. In some instances where the worm was seized by the middle it forced itself away, but when, as was usually the case, the radula closed on its anterior end, its fate was sealed (figs. 4 and 4 *a*). The radula and its cartilage are next withdrawn into the body, as far as its contracted state will allow, and the *Testacella* very gradually extends itself, giving more room inside, and crawling on to its prey literally envelops it. The worm, if small compared with the slug, disappears in a comparatively short space of time.

There does not seem to be any reason for supposing that *Testacella* only feeds at night, although, as earthworms seldom come above ground before daylight disappears, the slugs usually remain underground until that time. The experiments referred to above were all made in the daytime, and one morning many years ago, the writer saw a large yellow specimen, in a garden at Hampstead Heath, which had managed to secure a fine lob-worm.

Putting on one side such manifest elaborations as the crouching and springing described by Jeffreys, it seems very questionable whether *Testacella* stalks its prey, or even takes any direct notice of it at all until contact takes place. It is probable that its so-called agility consists merely of the strikingly rapid, but more or less automatic, protrusion of the radula, and that its indifference with regard to the worm's proximity that has been insisted upon, is a matter of necessity, and not invention.

It has already been remarked that some worms escaped when caught by the middle, while those seized so near to the anterior end that this was dragged in front of the mouth were ultimately swallowed. The first observer quoted expressly mentions the

end of the annelid, and the Hampstead specimen had its victim fast by the first few segments. Gassies and Fischer figure an example of *T. maugei* with its contracted end in contact with the middle of a worm, but there is no evidence that the latter is being held by anything, and it cannot well be imagined how a really large worm could be swallowed if seized in the centre, as two thicknesses of it would have to be drawn in at once.

Another point there is which is dependent on the comparative size of the worm—namely, whether it can all be swallowed at once—and indeed if a worm were caught that could not be accommodated within the slug, part of it might well be digested before the rest, which would remain connected with it, but outside the devourer.

It will be seen that *Testacella* is particularly well adapted for catching its prey should it meet them in the mouth or other portion of their tunnels. The slug on coming in contact with the head of an advancing earthworm, appearing above ground or what not, would contract, and shrinking back would entirely block the way with its now swollen body. The worm in endeavouring to proceed with more certainty than in the experiments, would continue to irritate the surface of the slug, seeking the groove above the slug's mouth—in some cases small worms actually managed to force their prostomia into the oral aperture—and would be caught in the grip of the radula as it was shot out and held securely, the slug maintaining by its broadened body a firm hold on the walls of the burrow. This method of procedure would not, of course, prevent the *Testacella* from attempting to secure worms in the open, its stealthy movements not alarming the latter in any way, but it would not be so certain of a meal, as the chances of a successful hit with the radula are by no means so great.

As already pointed out, Sowerby described *Testacella scutulium* as a distinct species, but it has been generally considered to be merely a variety of *T. haliotoidea*, and perhaps some good reasons for now treating it as a species ought to be forthcoming.

Mr. J. W. Taylor,* in 1888, states that Mr. Charles Ashford's researches on the anatomy in 1885 leave no doubt that *T. scutulium* is distinct from *T. haliotoidea*, but that it approaches

* "On the Specific Distinctness and Geographical Distribution of *Testacella scutulium*," Journ. Conchol. 1888, p. 337.

T. maugei more closely in certain points. Mr. Ashford states that he did not publish his results, which were communicated to Mr. Taylor by letter, and that the differences which he pointed out in 1885 he has since found to be constant. Mr. Taylor points out the external differences between the two forms, including the characters of the shells, and goes on to the internal anatomy, finding the greatest difference, as malacologists seem to do, in the reproductive organs, *T. scutulium*, like *T. maugei*, lacking the characteristic flagellum of *T. haliotoidea*. There is one weak point, however, in what is otherwise a convincing paper, and that is, that the organs of the first species are drawn from an example which is stated to be sexually immature. The present writer has been familiar with many of the external differences for some years, and has dissected a number of mature specimens of *T. scutulium* in which no more flagellum was to be made out than appears in Mr. Taylor's figure. There is also considerable difference in the shape of the radula and the teeth.

Thanks are due to Mr. Taylor for a copy of his paper, to Mr. Charles Ashford for his information, and to Mr. B. B. Woodward and Mr. Edgar Smith for assistance in looking up references in books under their charge at the Natural History Museum.

EXPLANATION OF PLATE.

TESTACELLA SCUTULUM, *Sowerby*—Buckhurst Hill, Essex.

- Fig. 1. The animal extended, seen from above.
 „ 2. The same, but seen from right side.
 „ 3. The animal contracted, with radula protruded.
 „ 3*a*. View of radula from above, enlarged.
 „ 4. The same as fig. 3, but the radula with an earthworm in its grip.
 „ 4*a*. Enlarged side view of radula, as seen in fig. 4.
 „ 5. The animal enveloping the earthworm by gradual extension.
 „ 6. Tooth from side of radula.
 „ 6*a*. The same, from a point nearer the centre of the radula.
 „ 6*b*. The same, from very near the centre of the radula.
-

THE CENTENARY OF GILBERT WHITE.

A PILGRIMAGE to the birthplace and home of a celebrated naturalist (if the memory of the man is to be respected) deserves to be undertaken in a spirit of calm contemplation and reverence of Nature, such as pervades every page of his own writing.

To invade his native village with a cavalcade of noisy, dust-stirring vehicles, laden with a few hundred excursionists, and to permit a posse of itinerant fair-goers to take possession of a centrally-situated meadow for the purpose of erecting swings and merry-go-rounds, with their hideous accompaniment of trumpet and steam whistle, seems nothing less than desecration. Yet this was what happened on June 24th, when the members of the Selborne Society, in conjunction with those of the Hampshire Field Naturalists' Club, met at Selborne to celebrate the centenary anniversary of the death of Gilbert White. By whose authority, or for what reason, the owners of trumpet and whistle were allowed to make themselves so objectionable, did not transpire; but, in the opinion of all right-minded members of the societies represented, they should have been sternly repressed. Their presence simply marred the enjoyment of what would otherwise have been a very delightful day.

To some extent we found compensation in the courtesy of Mr. and Mrs. Read, the present occupants of Gilbert White's old house, The Wakes, who kindly permitted visitors to inspect the premises and grounds. The latter are little changed since the date of our first visit some thirty years ago, save that the trees have grown and spread laterally to such an extent as to considerably reduce the charming view of Selborne Hanger which was once obtainable from the lawn. The house itself, alas! has undergone considerable alteration in the way of additions, which were made by a new purchaser on the death of the late Professor Bell. This well-known naturalist, it may be remembered, occupied the house for very many years; first as tenant, and subsequently as owner, and it was his pride to boast of his conservatorship as tolerating no change of any kind in either house or grounds, which he desired to see as much as possible in the condition in which White left them.

At the luncheon (that inevitable concomitant of all similar

functions), which was served in a large tent on the outskirts of the village, Lord Selborne presided, and made a speech appropriate to the occasion. He said:—

“ Whatever might be thought of any other manner of commemorating the centenary anniversary of the death of Gilbert White, no more fitting or proper mode of marking a sense of his contribution to the science and literature of the country could be devised than their meeting. White’s work had qualities which were not always met with in scientific or literary works. He would speak first of the character of the man, and then of the character of his book. Until lately there were no means of knowing anything about the character of Gilbert White except through his book, though a good deal might be collected from that source. When the late Professor Bell was engaged in collecting materials for his excellent edition of the ‘Selborne,’ he had the advantage of having placed in his hands a very large number of letters which were not included in the book, and among them about eighty-six family letters, which enabled them to see Gilbert White in a somewhat different aspect from that in which he presented himself in his book. Until those materials were found, the impression which most people had formed from the book alone—correct, generally, as far as it went, though perhaps not universally so—was this: first, that Gilbert White was a man of excellent natural abilities, strongly cultivated, and of wide classical attainments and accomplishments, conversant with the best Greek and Latin literature, and with the English also. In some of his letters he more than once referred to Chaucer and to the ‘Vision of Piers the Plowman,’ with which Englishmen even of the present day were not always acquainted. White was not only an observer of nature, but one who had prepared himself for observation by the best mental cultivation. He was thoroughly acquainted with all the literature of Natural History—his favourite pursuit—which existed in his time. No one could read his book without noticing his remarkable faculty of observation, the constant aim at truth, exactness, and accuracy, and a good deal of humour every now and then; nor could anyone help being struck both with the modesty and simplicity of his character. His modesty prevented him from bringing himself forward or drawing any picture of himself which would be adequate to give a perfect view of his nature. His simplicity contributed a very great charm to the book. White was curate of Selborne for many years, but vicar he never was, as he was not anxious for church preferment. The late James Russell Lowell, one of the most eminent literary men of his country, said in the beginning of his book, ‘My Study Window,’ that White had had a great deal of influence upon his love for observation of nature, and added: ‘One of the most delightful books in my father’s library was White’s ‘Natural History of Selborne.’ For me it has rather gained in

charm with years. I used to read it without knowing the great pleasure I found in it; but as I grow older I begin to detect some of the simple expedients of this natural magic. Open the book where you will, it takes you out of doors. In simplicity of taste and natural refinement it reminds one of Walton, and in tenderness of Cowper. . . . The book has also the delightfulness of absolute leisure. Mr. White seems never to have had any harder work to do than to study the habits of his feathered fellow-creatures. His volume is a journal of Adam in Paradise. The same combination of simplicity and refinement, the same humility and absence of ostentation and self-consciousness, which constituted the great charm of White's book, were equally conspicuous in his family correspondence, and the every-day habits of his life. It was clear from the correspondence that White was a most attached relation and affectionate friend, always ready to do everything in his power for all that had claims upon him. There had recently been some controversy as to the best memorial that could be devised for Gilbert White. He agreed with those who thought that the best memorial of the man was to be found in his work, and that nothing more was needed to remind the world of him. In compliance with the prevailing fashion, which was carried too far, it had been suggested that the centenary celebration should be the occasion of raising some memorial; but surely Gilbert White might have written with Horace, 'Exegi monumentum ære perennius.' His book would be his memorial to the end of time. Some statue or bust of White had been proposed, but he was a man who had never sat for his picture, of whose lineaments the present generation had no knowledge, and of whose figure it could only be asserted that it was a little below the ordinary height. As an alternative, it had been proposed that the memorial should take the form of something useful for the people of the village. That would not have the character of a personal memorial, and might soon cease to be associated with the present celebration; but, at any rate, that would be better, and Gilbert White himself would certainly have said so. Although on some points people at the present day might not agree with White, the difference did not interfere with the enjoyment of the book. His shrewdness of discernment was a most valuable gift, which he possessed in its most signal degree, and his love of God's creatures and of every branch of Natural History, to which he contributed so much that was both useful and interesting, was very remarkably displayed in his writing. He had love for all God's creatures, but, perhaps, especially for birds. By this love, and by one particular chapter in which, while confessing that he did not pretend to understand everything they said, he described with great charm the variety of their voices and notes, and what they signified, he reminded one of two great men. The one was mythical perhaps, and of remote antiquity—the Greek, Melampus. Melampus rescued and brought up some young serpents whose parents his servants had inconsiderately destroyed. One

day, while he was sleeping, these serpents nestled round his head, and when he awoke he found he had a new sense, an understanding of the different languages and chirpings of the birds. Without being far wrong, one might make some comparison between Gilbert White and Melampus. Coming nearer to our own times, less involved in the clouds of pre-historic doubt, St. Francis of Assisi was in some measure the forerunner of Gilbert White. There was a legend that he so loved the birds that they flocked around him while he preached sermons to them. Whether they understood him or not, the old legend at least showed this much—his love for those creatures, and his power of making them love him. These characteristics of Gilbert White could be gathered from his book, but the picture was filled up by a mass of family correspondence which had recently come to light. Mr. Edmund White, his nephew, who knew him very well, spoke of his ‘pure character and religious principles. He had the peculiarity of attaching to him all of every age, but particularly young people, who listened with delight to his instructive tales.’ This nephew said again, ‘If I were called upon to say in what point he particularly excelled, I think I should say it was his mode of addressing his poor neighbours. His kind, philanthropic and charitable tones towards them, and his humane inquiries, always made them feel that he was their true friend.’ Some people thought that White had nothing to attend to but birds, beasts, fishes, and insects; but that was a great mistake. Mr. Bell summed up the impression which he had received from all his researches in this way: ‘His life may be truly said to have been passed in the constant and diligent fulfilment of the duties of his holy office continuously from the time of his taking deacon’s orders in 1747 till his death in 1793.’”

After Mr. G. Darwin had proposed “Success to the Selborne Society,” the Earl of Stamford proposed “Prosperity to the Hampshire Field Club,” and in doing so remarked that

“During the last few months he had been engaged in the collection of reminiscences and unexplored documents relating to Gilbert White, who was a kinsman of his. Years ago an old woman of Selborne was asked what she remembered of Gilbert White, and answered: ‘He used to walk about the lanes, tap-tapping with his cane, and stopping every now and then to brush the dust from off his shoes.’ Gilbert White himself was not quite aware of the early history of his own family. He traced his pedigree back to one John White, of Swan Hall, in Oxfordshire, but, as a matter of fact, it could be traced back many generations further. He had the best authority for saying that an approximate likeness of White existed in the quarto edition of the ‘Selborne.’ Of the figures represented in the frontispiece to that edition, that represented as coming out of the tent was Thomas White, and that coming up the hill was Gilbert White. Benjamin White,

the publisher of the book, had frequently told his son that, though the figure was not exactly a portrait, in general outline and appearance it was very like Gilbert White. He had found the whole of the letters written to White by John Mulso, his most intimate friend, and he hoped that before long they would be rendered accessible to the public."

Interesting as this information is to all disciples of Gilbert White, we must beg to differ from Lord Stamford in regard to the alleged existing portrait. Many persons suppose that the clergyman represented in the folding frontispiece to the first edition is intended for White; but this is not the case. Of the figures there introduced the first is the Rev. Robert Yalden, vicar of Newton Valence; second, Mr. ETTY, brother of the vicar of Selborne; third, Mrs. Yalden; and fourth, Thomas Holt White, Gilbert's brother.

This information is derived from a footnote on page lviii. of the Memoir of White prefixed to Bell's edition of the work, and has the sanction of members of the White family, of whom representatives were present at the recent celebrations at Selborne, amongst others the Ven. Archdeacon White, who has recently returned from Queensland, and the Rev. Henry Masters White, of Oxford, both of them great-nephews of the famous naturalist.

Commenting upon this report, which appeared in the natural history columns of 'The Field' of the 1st July last, Lord Stamford the following week, July 8th, wrote as follows:—

"Permit me to offer a slight correction of the report of my speech at Selborne which appears in your last issue. My informant as to the identity of the figures represented in the frontispiece of the quarto edition of the 'Selborne' is the Rev. John T. White, D.D., who is still alive, and who was represented at the centenary celebration by his daughter. John White, Dr. J. T. White's father, was actually concerned in the publication of the quarto edition, and well remembered his uncle Gilbert. It was John White who frequently told his son that the figures were intended to represent Gilbert White, Mr. and Mrs. Yalden, and Thomas White. Mr. Bell's identification of the figures appears to rest merely upon his own *ipse dixit*, as he quotes no authority. The representatives of the White family present at Selborne on June 24th were Mr. and Mrs. Holt White, with their eldest son; Mrs. Newport, daughter of Dr. J. T. White; Rev. F. Field, Rev. Henry Masters White, Ven. Archdeacon Gilbert White, Mr. William White, the Misses Martelli, and the Earl of Stamford.—STAMFORD."

In 'The Field' of July 15th his lordship supplied the following additional information:—

"I have just received (July 13th) from Mr. Christopher, who married a daughter of John White (nephew of Gilbert White), the following note:— 'A Miss White, who was much older than my wife, and a constant resident with him (Gilbert), told my wife that all the family regarded Gilbert's likeness in the large print as a thoroughly good representation of him.'

"A misprint seems to have slipped into my letter in your last issue. The Ven. Henry Masters White (Archdeacon of Grahamstown) is no longer living. His son, the Rev. Henry A. White (Fellow of New College), was present at Selborne.—STAMFORD." [There was also present the Ven. Archdeacon White of Queensland.—ED.]

GILBERT WHITE AND HIS SUSSEX CONNECTIONS.

BY THE REV. PREBENDARY H. D. GORDON, M.A.*

THE very enjoyable commemoration at Selborne, on June 24th, attended by a large body of naturalists from London, Southampton, and the South Coast, may seem a fitting tribute to a book—'The Natural History of Selborne'—set out by its gifted author with much hesitation and characteristic modesty. The late Mr. A. Holt White (great-nephew of Gilbert) wrote from Biarritz, February 19th, 1878:—"The book itself was published at the earnest solicitations of my grandfather" (Thomas White, F.R.S., who finally reviewed it in the 'Gentleman's Magazine'), as Gilbert said he "did not want the reviewers to laugh at an old country clergyman!" And yet from the first no book has been more favourably received; and White's literary life, a century after his death, is more undying than ever. It was said by one who knew the Englishman well, that he lived in the open air and hated books. White's 'Selborne' is a compromise in this respect, for however fatigued, weary, or sick the reader may be, he is always from the first page to the last out in the open air of

* This article, by a valued contributor to this Journal, having appeared in a county paper, 'The West Sussex Gazette,' is likely to be missed by the majority of our readers, scattered as they are throughout the United Kingdom. It contains so much interesting information in regard to Gilbert White's family and associations, that we consider it deserves to be more widely read, and, as a matter of record, made more generally accessible.

his native country, hills, and dales. It has this characteristic stamp upon it, which may be found from Chaucer and Spenser to Pope in "Windsor Forest," in Cowper, Thomson, Collins, Wordsworth, and Tennyson. Another point, and one specially recommending it to men of few books, is that every line and description is perfectly simple and easily grasped. The whole book is short and idyllic, a model of note-books, giving the golden grain of a lifetime's observation in the happiest bloom of English language. Theocritus can certainly be traced in it. Even the absence of any reference to farming, for which Thomas White, in the 'Gentleman's Review,' pleaded that Gilbert was no farmer, is a gain instead of a loss to the English reader.

It was well said by Lowell, quoted by Lord Selborne, that White's volume is the "Journal of Adam in Paradise." It might be said that it is a journal in country life of Lord Bacon's philosophy too—ever giving experiment and induction on things close at hand. It is probable that from his maternal Sussex ancestors White had this peculiar tendency of mind. Sir Edward Ford, of Uppark, pupil of Chillingworth, and a most practical natural philosopher, won the admiration of Charles II. and Pepys for his many ingenious inventions; and Gilbert White was a Ford by blood and by tendency of mind. No one who compares Sir Edward Ford's tracts with Gilbert White's book can fail to be struck by the resemblance.

In that pleasant "As you like it," at Selborne, on June 24th, the "Forest of Arden" was represented by "The Hanger," wherein, however, "the sweet bird's throat under the greenwood tree was mute," save that of one fitful Chiffchaff and some Jays. All went well under Lord Selborne's presidency. His lordship, in an admirable address, quoted much from the late Prof. Bell's edition of White's 'Selborne.' This book has several references, new to many readers, as to White's Sussex connections. For instance, Gilbert White writes in his diary, as given by Bell, August 3rd, 1754, "Servants at Chilgrove and Chichester, 6s." The Chilgrove friend was John Woods, Esq., White's authority about the (then as now) scarce Stone Curlew. Three connections of Gilbert White with the Woods family may here be mentioned. First, one of Gilbert White's sisters married a Mr. Woods, in the line of the late Rev. G. Woods, Shopwyke, and the present Master of Trinity College, Oxford; next, G. White had land,

("Scotland") on the Harting Downs to the S.E. facing Chilgrove, the property of Mr. Woods. The newly recovered Church Book of Harting discloses the entry made in the handwriting of a most upright parson, Rev. John Newlin, M.A. :—" April 16th, A.D. 1734. I appoint Mr. Robert Wood in my nomination to serve the office of churchwarden this year, in the parish of Harting. John Newlin, vicar." The same appointment is made in 1735 and 1736, but in 1739 it is "overseer" for South and East Harting, and spelt as now, "Robert Woods." This is a spelling which also occurs in his own signatures, April 12th, 1737, and 1743, though he had previously signed himself (1735) as "Wood." He was also overseer in 1747. He died after losing his wife, *née* Anne Luff, and was buried at Harting Church, Sept. 2nd, 1755. John White, father of Gilbert, was living in Harting, as Mr. Bell has shown. He states that Francis, the sixth son, brother to Gilbert, was born at Harting, March, 1729—entered thus in Harting Register, "1729, March 2—Francis, son of John White, Esq., baptised," and that the family did not leave Harting till Gilbert White was thirteen years old, 1733. This shows that Gilbert White must have lived at Harting for at least four years, and had his earliest impressions of nature here in Sussex. In the year 1734, when Mr. R. Woods was vicar's churchwarden, he would be *ex officio* a trustee of the Feoffee Charity; and a deed, apparently drawn by Mr. John White, a barrister (Gilbert's father), as co-trustee of this charity, has the signature of John White, and is in the possession of Mr. John Lever, C.C., of Kent House, East Harting, as chairman of the Harting Feoffees. Therefore, the Woods family and the Whites must have known one another, sitting at the same board as co-trustees of the Harting Charity in 1734, and must have been some of Harting's most influential residents. It is unfortunate that we cannot trace the residence of the Whites at Harting, but probably it was either at Tye-oak, East Harting, or at Woodhouse, their farm, till the end of the 18th century, on the N.E. corner of our parish, near Rogate and Harting Station. No doubt Gilbert White, who never seems to have lost a friend, would maintain his friendship with the squire of Chilgrove. It was his own geniality that made him say to Marsham, on first acquaintance, like fruit of new flavour, "Oh, that I had known you forty years ago!"

But on August 3rd, 1754, Gilbert White went on from
ZOOLOGIST.—AUGUST, 1893.

Chilgrove to Chichester, and there also he had many Sussex connections. Gilbert White was great-nephew to the great Chichester benefactor, Oliver Whitby, himself great-nephew to Sir Edward Ford, of Uppark, (why were there no Whitby boys at the Selborne pilgrimage, to celebrate their founder's great and greater nephew?) through whom he inherited lands in three places of Harting. One parcel was $13\frac{1}{2}$ acres of land in the centre of Uppark, which he sold to Sir Matthew Fetherstonhaugh, the signature of G. White being among the archives of Uppark, as my late and gifted friend Mr. Weaver told me. Gilbert's mother, Anne Holt, was of true Sussex blood and a Sussex heiress; for she brought her son kinship with the Whitbys, Fords, and Hydes. The Benjamin Hydes—father and son, for there were two—were notable citizens of Chichester, connected by marriage with the two Oliver Whitbys. The picture of Benjamin Hyde, by Jansen, formerly at Selborne, and the blue garter and ribbon given him by Charles I., are possessed by Rev. E. Field, M.A., of Lancing College. There is an autograph of G. White, in possession of his nephew, Samuel Barker, Esq., Lyndon Hall, Rutland, wherein Gilbert White sets forth his lineage:—

“Thomas Holt, father of Anne Holt, afterwards wife of John White (my father) was born at Petersfield in the county of Southampton. He was first Demy of Magdalen College, Oxford, but never Fellow. Afterwards preferred by the Duchess of Bedford to Streatham Rectory, where he died. He married Anne, daughter of Mr. Benjamin Hyde, of Chichester, a Russia merchant. The father of that Benjamin Hyde was also a Russia merchant, and according to the custom of the times traded personally to those parts, being called merchant adventurers. They went particularly to the White Sea. The above-mentioned Anne Holt, wife of John White, was born at Streatham, November, 1693; and died at Selborne, November, 1739.—(Signed) GIL-WHITE.”

It is to be added to this Sussex historical sketch that John White and Anne Holt were married in the parish church of Rogate, in Sussex, September 29th, 1719. Professor Bell also showed me a draft of a codicil to Gilbert White's will in his own handwriting:—

“Whereas I, the Rev. Gilbert White, of Selborne, in the County of Southampton, Clerk, have duly made and executed my last will and testament in writing, bearing date the second day of November last [1791]. And

whereas since executing my said will I have suffered a recovery of my estate at East Harting, otherwise Harting, in the County of Sussex, now I do hereby give and devise unto my — all that my messuage, farm lands, tenements and hereditaments (no doubt Woodhouse), with the appurtenances, situate and being in the parish of East Harting, otherwise Herting, in the County of Sussex, called or known by the several names of Deane's, Boye's, Woodhouse, and Maxwell's, or by whatsoever other name or names the same or any part thereof is called or known. To hold unto him my said —, his heirs and assigns, for ever. And I do declare this to be a codicil to my said will, &c., &c. Dated the — day of January, 1792."

It may not be known that the greatest collection of relics of Gilbert White and his kindred is at present in Sussex. Rev. Edmund Field, M.A., showed his treasures at Lancing College to the White family, and gave a most interesting address on his great ancestor, which riveted the attention of all present. Mr. Field is a direct descendant of Gilbert White, and most materially assisted the late Prof. Bell in his edition of White's 'Selborne.' There were present the Earl of Stamford, Mr. H. M. I. Rashleigh Holt-White and his lady, Ven. Archdeacon White (Queensland), Mr. William White, architect (who produced a fine design for the water conduit proposed for Selborne), and Mrs. White, Mrs. and Misses E. and Agnes Martelli (Hampstead), and Rev. Henry Alcock White, Fellow and Tutor of New College, Oxford. These eleven represented the White family, distinguished by its attainment of no less than eight first classes at Oxford, the youngest member having recently obtained three first classes and two University prizes at Oxford. Canon Lowe, Warden of Lancing College, was also present.

The room abounded with relics of the White family, the Selborne treasures of Prof. Bell, and many others added, pictures of Charles I., wearing the Oxford blue of the Garter, and Henrietta Maria, his queen; a magnificent Jansen of Benjamin Hyde, formerly at Selborne, and already referred to; also of the Rev. Sampson White, head of the great Hampshire family of White, descended from John White, Bishop of Lincoln, and subsequently of Winchester, and Warden of Winchester College in Mary Tudor's time (1541-1554). Ultimately the White family claim the royal Plantagenet blood of Henry III. Space would fail to give an idea of the vivacity and wit with which the accomplished lecturer handled every scrap of antiquity, from the sword of Sir

John White, Lord Mayor of London, 1563, and the pale Cambridge blue silk ribbon that Charles I. gave to Benjamin Hyde, down to the light cane high stool on which Gilbert White sat to write his famous book; for an armed, or even a backed chair, his Spartan industry would not tolerate. Some of the last words and thoughts of the great naturalist, Mr. Field said, were on the words, "I know that my Redeemer liveth"—words which he seemed to have repeated as a dying watchword, as Bede spoke of his "forthfaring" before his death. It was announced that the early private letters of Gilbert White to "Tom Mulso," his college friend, and Miss Hester Mulso, his sister, the heroine of the lines written by "Timothy," the Sussex Tortoise, from Lewes [Ringmer], would probably be recovered for publication. The shell of "Timothy" is now in South Kensington Museum.

A very interesting memorial of Gilbert White, which has recently come into the writer's possession, viz., a copy of Hudson's 'Flora Britannica,' 1752, with Gilbert White's autograph on the first page and his private notes, in ink and pencil, of all the flowers found at Selborne, was exhibited, and was acknowledged by Messrs. Field and Holt-White, and Mrs. Martelli, to be genuine. It shows that in 1762 Gilbert White was no mean botanist, but well posted up in the latest book applying the Linnæan system to the Flora of Great Britain.

For the parentage of Homer seven cities strove. It ought to be an amicable arrangement between Sussex and Hants that Gilbert White belonged to both, as a sojourner and landowner, an illustrious example of the old historical adage that people born on the confines of two races are apt to produce men eminently gifted. Border men from Chaldæa and also in Egypt, in their contacts and rivalries produced in meeting places of the highways of mankind, or sometimes in river basins, those cradles of civilisation, leaders of thought and types of higher life. Aristotle lived from his earliest life, steeped so to say, in the many streams of different kindreds of men. Mahomet was born at Mecca, the meeting place of the tribes. Chaucer, the vintner's son, was born in the throng of London; and Shakespeare's school was London also. Argos and Mycene must have crowned mutual altars for their great native Hercules or Herakles; and some day Sussex may set up some memorial—a most delicate

subject—of that sweet and ever vernal philosopher of nature whom Lord Selborne so well described. What shall it be, when, and where?

NOTES AND QUERIES.

MAMMALIA.

Protection of Kangaroos.—A year or two ago I furnished a note on the threatened extinction of the Kangaroo. A committee of local naturalists worked hard to prevent this, and finally, after encountering a good deal of opposition, succeeded in securing the appointment of a close season extending from November 1st to April 30th. These are our summer months, during which time skins are of little commercial value, as they become sunburnt while drying. We have also secured the insertion of a clause in the Act providing for the proclamation of districts within which Kangaroos are to be protected for any period. By means of this clause we have obtained the proclamation of Kangaroo Island, a large island off the mainland, and part of our western coast near the great Australian Bight. The importance of the matter is now being recognised in Victoria and New South Wales, and possibly Kangaroos will be protected in due course throughout all the Australian colonies. It is but fair to mention that in this work we have had the hearty co-operation of American tanners and local exporters of skins.—A. F. ROBINS (Adelaide, S. Australia).

Food of the Squirrel.—Amongst the food-stuffs of the Squirrel may be reckoned wall-fruit, such as apricots. In this district I have heard them accused of stealing the latter, but was somewhat sceptical until the other day, when I caught a Squirrel in the very act—red-handed—taking an apricot from the garden-wall. On two sides of the garden there are oaks, and in one place the branches overhang and touch the wall; the Squirrels use this as a bridge. They prefer apricots which are somewhat hard and not such as are fully ripe. Mr. J. A. Harvie-Brown ('The Squirrel in Great Britain,' p. 178), on the authority of Captain Dunbar-Brander, includes kernels of apricots amongst their food; but it is not the kernel they are after, but the fruit, or pulp, as I can testify by having watched one, through a glass, holding the fruit between his paws and deliberately devouring the pulp till all was finished; the kernel was then dropped to the ground, and I forward two for the Editor's inspection to show that they are not even guawed. I think I have succeeded in stopping the marauders (without resorting to extremities), by cutting away the boughs of the oaks where they touch the wall.—J. CORDEAUX (Eaton Hall, Retford). [The apricot-stones forwarded completely justify our correspondent's remarks.—ED.]

Swimming Cats.—The domestic cat is proverbially averse to a wetting, and although some members of the family take to the water readily enough, I have always believed with Gilbert White that “pussy of all quadrupeds is the least disposed towards water.” Hearing therefore that two young cats at the Swan Baths on the Norwich river were accomplished swimmers, I called upon Mr. Ransome, their owner, who very kindly exhibited the natatory powers of one of them for my benefit. The younger of the two, only two months old, having already crossed the river twice, he hesitated to put it through its performance again, for fear of tiring it. I therefore had not the pleasure of seeing the two swim side by side; but its fellow, a month older, he took across the river in a boat, and returning to where I stood called it to his side, when puss, apparently without the slightest fear, and without hesitation, took to the water and swam with head well up, very lightly and rapidly across the river, which is certainly quite twenty yards wide, crossing straight over, notwithstanding a strong current which was running. It left the water by the bathing steps without assistance, and apparently not at all fatigued, although it had then crossed for the third time that day. Its chief care on landing seemed to be to dry its feet. Mr. Ransome is the teacher of swimming at the Baths, and he has certainly been most successful with his little pupil, which he told me he trained gradually and purely by persuasion. I hear that since I saw this curious feat, some thoughtless person threw one of the kittens into the water, after which it was shy for a time, but since then, by kindly persuasion, it has quite regained its former confidence.—THOS. SOUTHWELL (Norwich).

Variation in the Colour of Field Voles.—In reply to Mr. Service's enquiry on this subject, I may say that on July 19th I saw, alive, at Mr. Bristow's, taxidermist, of St. Leonards-on-Sea, a pure white variety of the Short-tailed Vole, with black eyes. It was brought to him on July 13th, by a boy who caught it at Hollington, about two miles from here. It is a full-grown specimen, and is still in Mr. Bristow's possession.—GEORGE W. BRADSHAW (The Memorial Studio, Hastings).

Water Shrew in S.W. Lancashire.—In April last I was fortunate in being able to watch for a short time the habits of this rather seclusive species. It was industriously diving repeatedly from the surface in the middle of a stream pool, and apparently feeding on insects. On my approach the Shrew immediately made up-stream, cleverly wriggling with distended body under water, and making the most of such covert as was afforded by submerged weeds. With the assistance of my brother, we chased it under a stone, and eventually captured a nice variety of *Crossopus fodiens*. Description:—Sex, male. Body stout; general line of the upper parts greyish black; lower parts whitish grey; chin, throat, and belly whitish grey, becoming slightly yellow at the abdomen. Eyes blue,

and small. Fore legs silvery grey; hind legs slightly darker. Upper and under sides of tail (which is flat) correspond in colour with the upper and under parts of body, and is ciliated with strong white hairs. This specimen has been mounted, and is intended for the collection in the Museum here. The habits of this pretty little mammal render observation difficult, and I have only occasionally met with the species before in this district, though, no doubt, if properly looked for, it will be found distributed generally throughout the county.—C. E. STOTT (Bolton-le-Moors).

BIRDS.

The Marsh Warbler in Oxfordshire.—In August last year (Zool. 1892, p. 303) I described the discovery of *Acrocephalus palustris* in an osier-bed near Chipping Norton. We did not succeed in finding the nest, owing to the large area of the osier-bed, and the want of a point of vantage from which to watch the movements of the birds. The osiers were cut last winter, and the birds have not returned to it; their place has been taken by Grasshopper Warblers, which in the hot evenings have been making the air vibrate all around with their incessant reelings. On June 20th it occurred to me to make a careful examination of another osier-bed, about half-a-mile further up the railway line. Here the osiers were uncut, and here, too, the embankment of the railway enabled me to look directly down on them. I soon heard the familiar song, and saw the birds once or twice. Next day, by watching from this embankment, I was able to make a guess at the position of the nest, and penetrating into the osiers, I found it at once. It was not yet finished, and during the next two or three days I was able to watch its progress. It was about three feet from the ground, slung between the willow-shoots in such a way that they were not worked into the sides of the nest, but only through the outer rim; the nest thus looked like a little basket suspended by three or four handles. It is rather a more solid structure than those I have seen in the Alps; a quantity of green moss was added to the lower part of its exterior after I first saw it. The body of the nest is, however, almost entirely of dried grass, with a few horsehairs in the lining. On the 24th Mr. A. Holte Macpherson came down from London to see it, and that night luckily the birds laid an egg, which he found before breakfast in the morning. Next day was Sunday, when the predatory ploughboy roams afield in quest of eggs, and we had to organise a watch during the whole of that long day. On the 26th another egg was laid; and as I was about to leave England for three weeks, I decided to take the nest and two eggs for the Oxford Museum. This has been successfully accomplished by cutting away the saplings above and below the nest; and I hope the birds may get over their disappointment and build again. The eggs are exactly like those Mr. Aplin and I found in Switzerland; greenish white in ground colour, with many

dull purplish spots and blotches, especially at the larger end. The nest was about twelve paces from the edge of the osier-bed, on dry ground, but close to a ditch of running water. It is in Oxon, but within twenty yards or so of Gloucestershire. Adjacent to it is a field of wheat, and hard by is also a field of beans, in one corner of which, oddly enough, a Reed Warbler—a bird almost unknown here hitherto—has sung every day to me as I passed it on my way to the nest of its cousin.—W. WARDE FOWLER (Kingham, Chipping Norton).

Hybridity.—I should be much obliged to any readers of 'The Zoologist' who will send me notes of any facts which have come to their knowledge respecting hybridity, the interbreeding of species. I should also be grateful for hybrid specimens for examination and to illustrate my work, 'Wild Hybrid Birds,' of which four parts are already published, and shall be glad to pay all expenses of transit.—A. SUCHETET, Bréauté, par Goderville (Seine Inférieure).

The Common Sandpiper nesting in the Eastern Counties.—It does not appear, so far as I can ascertain from the published accounts, that the Common Sandpiper, *Totanus hypoleucus*, has so far been recorded as nesting anywhere in the Eastern Counties between the Thames and Humber, its occurrence being restricted to a double passage in the spring and autumn. It is therefore with some satisfaction that I am able to record it as nesting recently in Lincolnshire. The Rev. C. W. Whistler, of Theddlethorpe (an excellent naturalist), informs me that on June 16th, 1890, he and his brother found two nests near each other in a wide depression, or marsh, amongst the Lincolnshire sand-hills. I am well acquainted with the locality, which, except in very dry years, holds shallow pools of water, of considerable extent, surrounded by sedges and rough herbage, with patches of bare shingle or sand. The nests were on slightly elevated ground—an island when the water is out—and they were somewhat pyramidal in shape, with shallow depressions in the centre. In both cases the young had left the nest, and the egg-shells were found near one of them. From the actions of the two pairs of birds, there could be no doubt the young were close at hand, one of the parents doing the broken-wing trick to perfection in endeavours to draw the intruders from the spot. A few Sandpipers frequent the Trent between this county and Lincolnshire through the summer, and I have seen two, and sometimes three, on the Idle at this place throughout the spring and summer months up to this date, but without any proof of their having nested.—JOHN CORDEAUX (Eaton Hall, Retford).

Green Sandpiper in Lincolnshire in June.—On July 1st I saw at Mr. Fieldsend's shop at Lincoln an adult Green Sandpiper, *Totanus ochropus*, which was brought to him by a labourer who stated that he shot it

on June 22nd, from a flock of six flying about a stream at Cold Hanworth, about nine miles N.N.E. of Lincoln. There can be no doubt that the Green Sandpiper has occasionally remained to nest in England, and the occurrence of six together in Lincolnshire at this date is suggestive of a family party, reared somewhere in this county.—JOHN CORDEAUX (Eaton Hall, Retford).

Curlew Sandpiper in Co. Donegal.—As the Curlew Sandpiper, *Tringa subarquata*, is not included in Mr. Chichester Hart's list of the birds of Donegal (see Zool. 1891, pp. 421—424), it may be well to report that I shot a bird of this species on the 26th December, 1892, on the margin of Lough Kiltoons.—J. STEELE ELLIOTT (Dudley).

The Green Sandpiper in S.W. Scotland.—The Green Sandpiper is a tolerably regular, but always extremely scarce, visitant to South-Western Scotland. On the 27th December, Mr. Mackay (who as a taxidermist is worthily filling the blank made in Dumfries by the death of Mr. William Hastings) very kindly brought for my inspection a nice specimen of this species, shot a day or two previously by a gunner on Conheath Merse. Another was shot at the same time, but was too much injured for preservation. I had not seen the species locally since January 6th, 1885, when one was brought in to the late Mr. Hastings that had been shot the day before in Kirkmichael. The late Mr. McKenzie, Barnhill, possessed a specimen that was shot on the margin of the pond in Terregles Park. There is a very interesting notice in Sir W. Jardine's 'British Birds' of the occurrence of a number of this species at Jardine Hall and the vicinity. The species has also been shot near Castle-Douglas, and through the kindness of Mr. John A. Harvie-Brown I have been furnished with the following extract from the Catalogue of British Birds collected by Mr. W. Smellie Watson, copied from the original MS., now in the Museum of the University of Edinburgh:—"This beautiful little bird I shot on the marshy grounds behind Carlinwark House, Castle-Douglas, when shooting Snipes. On the wing it [*i.e.*, the back] appeared so white that it resembled a snowball, and its flight was not unlike that of a Common Snipe, but not so quick. It is a solitary bird, and not common. I did not meet with another the whole day, although I went over a very extensive marsh. None of my friends in that neighbourhood had ever met with one of the species before." Mr. Smellie Watson gives no date for this record, but the Catalogue was written in 1836.—R. SERVICE (Maxwelltown, Dumfries).

Nesting of the Quail in Somersetshire.—A farmer who lives close to the Moor, a few miles from this town, and whom I had asked to obtain for me the eggs of the Water Rail, should he come across a nest, brought me on July 19th, the egg of a Quail to know if this was what I wanted. He

found the nest in a field close to the Moor when cutting the grass, and it contained nine eggs. They were slightly incubated, as he unfortunately broke one to see.—H. ST. B. GOLDSMITH (King's Square, Bridgewater).

Quail in Worcestershire.—Whilst driving near the small village of Churchill, on the 29th June last, I heard a Quail calling lustily in a field of oats near the roadside. The remarkable weather during the period of migration this year seems to have been favourable to these birds, for they have been reported from many localities, and in some of them are said to be numerous.—J. STEELE ELLIOTT (Dudley).

The Quail in South-West Scotland.—There is reason to believe that at the end of last and beginning of this century Quails were tolerably numerous in the south-west of Scotland. From then till the fifties they visited us in gradually lessening numbers, and finally disappeared as regular summer visitors. Sir Wm. Jardine ('British Birds,' vol. iii. p. 106, 1844) says that "Thirty years since (say 1813) they were tolerably common, and regular in their return, and even in the south of Scotland a few broods were occasionally found." Again, in the 'New Statistical Account of Dumfriesshire,' the same naturalist states that Quails are "occasionally met with in the parish of Applegarth, at the the time of migration, September and October. In 1819 they bred there and produced large bexies." I find in an old natural-history periodical, which came out at intervals in 1857-58 and then failed, a couple of interesting letters referring to Quails above the signature of "W. S. T." (the initials, I believe, of a Mr. Thorburn, who then resided near Maxwelltown). The following extracts are from the letters referred to:—"I have lately been informed by a gentleman who is the proprietor of a portion of Lochar Moss, that fifteen years ago (say 1842) not an individual of this species was to be seen in the Moss. Since that time two or three pairs arrived yearly, until recently he has observed that the number of immigrants have increased. From 1853 to 1856 the piping of the Quail was regularly heard, and several individuals were seen, and in the summer of 1854, in cutting a field of grass, a mower came upon a nest containing about a dozen eggs, with the bird crouching close to the ground." In a subsequent issue of the periodical referred to, "W. S. T." writes, *inter alia*:—"I lately sent you an account of Quails having been discovered in Dumfriesshire in 1854. I have again the pleasure of informing your readers that this year (1857) another brood has been seen." In Galloway, Quails were formerly much better known than to eastwards of the Nith. Indeed, it may be said that the Wigtownshire folks were quite familiar with these birds, for Messrs. Gray and Anderson, in their 'Birds of Ayr and Wigtown,' observe that it is known to the country people by the name of "Wet-my-foot," these words being supposed to be expressed in the sounds emitted by the birds on summer nights. In the 'Old Statistical Account' (parish of

Buittle), there is a statement that Quails were very abundant in Wigtownshire at that time (1795), and the writer (Rev. G. Maxwell, of Glenarm) adds, in reference to Buittle parish, that Quails "were hardly known a few years ago, although now abundant." The species is included amongst the birds of Colvend by Mr. McDiarmid in his useful little history of that most interesting parish. Mr. Peter Adair, in a recent number of the 'Annals of Scottish Natural History,' published a good account of the former abundance of Quails in Wigtownshire, and gave a long and most extremely interesting series of details of their disappearance within the last quarter of a century. In Dumfriesshire, as has been shown, their annual visits seem to have ceased somewhat abruptly about the end of the fifties, and in the Stewartry I have every reason to believe they came for a few years longer, and (so far as I know) one shot on Barnhill of Terregles in September, 1874, and another also in autumn within the last year or two, shot on Shambellie, are the only occurrences since the middle of the sixties. The foregoing notes will give those who are interested in such a subject a general idea of the status of the species in south-west Scotland. In the course of a long experience of birds and their ways throughout these southern counties, I have never seen the Quail alive in a wild state, nor heard its call until June of the present year, when Mr. Robert Armstrong, tenant of the farm of Rotchell, sent me a message to the effect that in mowing hay his men had come upon a couple of nests containing eggs, the like of which he had never seen before, adding that he had an idea they might be those of Quails. Of course I lost no time in getting to the spot, and a glance at the nests and eggs was sufficient to assure me that Mr. Armstrong's surmise was quite correct. The nests were discovered just as the hay was being cut, and the motion of the scythes frightened the sitting birds. Neither Mr. Armstrong nor I wished to take the eggs, or to disturb the birds more than could be helped, and so the eggs were let alone after a brief examination of the nests and surroundings. One nest contained five eggs, and was a mere hollow scraped in the soil with almost no lining at all; the other one contained nine eggs, and was tolerably well lined with pieces of moss and small grass fibres.—R. SERVICE (Maxwelltown, Dumfries).

Nesting of the Grey Wagtail and Dipper in Surrey.—On April 15th of the present year my friend Mr. Elliot and I discovered a nest of the Grey Wagtail, *Motacilla boarula*, with four eggs, in the neighbourhood of Wimbledon. Owing probably to some new work being commenced within a few yards of the nest, the eggs were deserted and stale, two of them adhering to the bottom of the nest, although on blowing them I found that incubation was some five or six days advanced. I felt sure from a previous similar experience that when these deserted eggs were removed from the nest, the bird would return and lay afresh, and on Mr. Elliot visiting the spot some two days later he found the nest contained

two fresh eggs, much lighter in colour than the first four. I trust therefore that a brood was eventually reared. The nest was built behind a tuft of nettles growing from the wall of a sluice. Both nest and eggs were of the typical Grey Wagtail type, and although I did not see the bird myself, it was observed and identified without doubt by Mr. Elliot, who knows the species well. I have obtained the nest and eggs of the Grey Wagtail in Somerset, and believe it has been obtained also in Hampshire, but I know of no previous actual record of the nesting of this species in the south-eastern counties of England. I discovered an old nest of the Dipper, *Cinclus aquaticus*, in a disused culvert. It was just such a spot as the Dipper loves to select for its home, but unfortunately there were no signs of the nest being renewed this year, and from its appearance was probably two years old. As I can find no previous notice of the Dipper nesting in any of the south-eastern counties, this record may stand for what it is worth until somebody is fortunate enough to actually discover the eggs or young. Every ornithologist will have noticed the partiality of the Dipper and Grey Wagtail for similar localities, on which account their general distribution is generally very similar. It is somewhat remarkable, however, that this companionship should be carried so far as the nesting of the two species within a few yards of each other in a locality where practically neither had been found breeding before.—ROBERT H. READ (The Grove, Ealing).

Black Tern in Yorkshire.—The keeper of the Hoyle Mill-dam (about seven miles from Wakefield) gave me, for identification, an adult Black Tern, *Hydrochelidon nigra*, in good spring plumage, which he shot at the dam on May 15th. It measured 22 inches from tip to tip of extended wings, and was one of a large flock which came down to the dam on the evening of that date, and stayed there about half-an-hour, skimming over the water and frequently touching it as they flew. While they were there all the Coots retired into the rushes, and there was neither a Swallow nor a Swift to be seen there. These Terns came from the N.E. and flew off in a south-easterly direction.—C. I. EVANS (Ackworth, near Pontefract).

Ornithological Notes from the Alps.—At the end of June it was my good fortune to start with Mr. Warde Fowler for Switzerland, where we spent twelve days in search of birds, and where we found a few nests, a description of which may be of interest. I need hardly say that without Mr. Fowler's experience I should have found very few of the birds we saw, and it is only at his wish that I venture to write this account. At Stanzstadt, where we commenced operations, is a large expanse of marshy ground where meadow-sweet (*Spiraea ulmaria*) and other tall plants grow in abundance. Here the Marsh Warbler (*Acrocephalus palustris*) was common; and though several evidently had their young about with them, we succeeded in finding one nest of this species with eggs. This was

placed in the stems of a tall plant, apparently a kind of nettle. Twelve stems of this plant passed through the rim of the nest, which was made almost entirely of dried grass, with very little horsehair. There was no moss, as there was in the nest found this year at Kingham by Mr. Fowler, which has already been described in 'The Zoologist.' The hen was sitting on five beautiful eggs, and the cock, who was singing quite close to the nest, continued his song only a short distance away, even after we had flushed the hen from the nest. The Engstlen Alp seems to be a favourite place of the birds, and there I was glad to make the acquaintance of many that were quite new to me. The Alpine Pipit (*Anthus spipoletta*) is abundant, and his cricket-like song is to be heard throughout the fragrant pastures. By a piece of good luck we found a nest and eggs of this bird. It was placed on a steep grassy slope, and was sheltered by a very small tuft of Alpine roses; both in construction and position it was much like the nests of other pipits which I have seen. The hen was sitting on five eggs which were marked not unlike those of the Rock Pipit (*Anthus obscurus*), but were of a greenish colour. I also caught a young bird scarcely able to fly, and noticed that its throat was creamy white, and that it was much spotted on the breast. The inner webs of two feathers on each side of the tail were white, and the legs and feet were yellow. One morning I clambered up the steep grass slopes to try and find a nest of the Alpine Accentor (*Accentor alpinus*). Before I had gone very far I found a pair of these birds carrying food, and after a good deal of watching, succeeded in finding the nest. The cock and hen were so much alike, that I could not see any difference; they moved about silently, flicking their wings in a restless way, and after I had been watching them for some time, one flew away and the other deliberately ate all the food it was carrying. In a short time, however, both returned, and one soon went to feed the young. The nest was well concealed under a rock which projected from a very steep bank and was covered with grass. Some of the grass hung down in front and formed a screen. It was substantially made of short bits of dry grass and moss, and contained a few feathers. There were four young, whose feathers were only just beginning to grow; when they opened their mouths, crying for food, I was able to see that there were two black spots at the back of their tongues. Higher up, about the precipices, were numbers of Alpine Choughs (*Pyrrhocorax alpinus*). I came upon two young birds whose bills and legs were black. The old birds kept wheeling round with their beautiful flight, sometimes uttering a curious whistle, and I saw several flying in and out of crevices in the rock where they had their nests. Perhaps the most delightful nest we saw was that of a Teal (*Querquedula crecca*). Lined with down, and containing six eggs, it was placed in the midst of a bush of Alpine roses, close to a very small pool of water, and at some little distance from the lake. By crawling carefully we managed to

get within a couple of yards of the nest before the hen bird fluttered away, close to the ground, and went on to the lake. On a precipice near Meiringen we were much delighted to observe the Wall-creeper (*Tichodroma muraria*). We saw the bird alight on the rock and creep about with little jerks, disappearing at times into a crevice. The rock was fully exposed to the rays of the sun, and through our glasses we could easily distinguish the crimson on the bird's wings. What especially surprised us was its flight, which so much resembles the flight of a small falcon, that when it first left the rock we neither of us thought it was the Wall-creeper that had gone, and only perceived that this was the case when the pseudo-falcon returned, and again began to creep up the rock. At Engelberg Mr. Fowler found the nest of a Grey Wagtail (*Motacilla boarula*) in a curious position. It was placed on a beam inside a boathouse by the side of a small pond in the hotel garden. The nest was large and untidy, and contained six young which the parents were busy feeding. We saw many other birds which were quite new to me, and heard some songs whose authors have yet to be identified; which only makes us look forward with more eagerness to another year, when we can again pay a visit to such a delightful country.—H. C. PLAYNE (Oxford).

The Greater Spotted Woodpecker killing a young Pheasant.—While staying lately in Gloucestershire I heard that the keeper had just shot a bird which he called a "French Eagle," and which he said had carried off one of the young Pheasants from the front of the coops. I asked to see the bird, and it turned out to be a Greater Spotted Woodpecker! I "pooh-poohed" the story, and suggested explanations; but when I saw the keeper, the next day, he stuck to his story, said he saw the bird fly down, pick up a young Pheasant, fly with it up into a tree, and then and there smash the head with its bill, and that he then shot it with the little Pheasant in its claws. The latter, which I saw, was covered with blood. Has any such habit as this been recorded of any species of Woodpecker? *Eagle*, of course, is evidently a corruption of *eccle*, *heccl*, or *hick-wall*, the local name for a Woodpecker.—J. H. BELFRAGE (Littleworth Lodge, Esher).

[Some years ago, when pheasant-shooting near Uckfield, in Sussex, we saw a defunct Green Woodpecker strung up with several Jays, Kestrels, and Magpies upon a "keeper's tree." On pleading with the head-keeper in defence of the Woodpecker, he assured us that he always shot these birds when he had a chance, as they killed his young pheasants. He was not prepared, however, with any evidence in support of this charge (never having caught one in the act), and we came to the conclusion that the real culprits were Jays, whose propensity in this direction has been elsewhere satisfactorily proved. Mr. Borrer, in his 'Birds of Sussex,' writing of the Greater Spotted Woodpecker, says, "I am not aware that it has any local name," but both

in Sussex and Hampshire we have often heard keepers and beaters call it "French Magpie," a name by which it is known also in Devonshire, though in other counties this name is bestowed upon the Grey Shrike.—ED.]

Preservation of the Kite in Wales.—I write to ask if nothing can be done on behalf of our unfortunate Welsh Kites. I have lately visited a remote district where they still linger. Ornithologists will understand the interest excited by the first view of these fine birds upon the wing. Their flight is like the Buzzard's stately sailing, interrupted now and again by a few slow flaps suggestive of the Heron. The wings are longer and more pointed than those of the Buzzard, and show more "elbow." Two pairs were met with; a few others might possibly have been found had time allowed of further search. A farmer showed me the eggs of the first pair, which he took about April 25th, at the request of a gentleman collector, who was expected to call for them shortly. He also pointed out the nest, which would have filled a large wheel-barrow, and was almost certainly more than one year's accumulation. It was in a thin wood of "spear" oaks, about thirty-five feet up a slender tree of some ten inches diameter, just at the point where the upper branches diverged. It was composed of oak and birch sticks, and was from 2 ft. 3 in. to 2 ft. 6 in. across; 2 ft. 6 in. deep. After being disturbed here, the birds made an attempt to nest at a spot about half-a-mile distant, but were apparently driven off by crows before any eggs were laid. At the date when I saw them (May 23rd) they may have been building again, but the hen was not sitting. I was shown the nest of a second pair on May 23rd. It was in a similar tree, but only about twenty feet from the ground. The eggs had been taken a day or two previously, as the bark scratched by climbing-irons indicated. The lining of the nest in all cases consisted chiefly of rags and newspaper, once with the addition of a blue sugar-bag. I was told that another pair had built in a tree which grew from the side of a deep ravine, and that the female bird had been killed on the nest by a stone thrown from above. I cannot confirm this, though the description was so circumstantial as to leave little room for doubt. Unless something be done, the birds are doomed in this locality. While the trees are still bare, they build a nest which can be seen a mile away, in a tree which any schoolboy can climb. Shepherd lads borrow a gun to shoot the old bird from the nest, or take the young ones, which, bedraggled and with wings cut, mope about the stables and kennels of the neighbouring gentry. Others stray down to the pheasant preserves, and get trapped or shot. There are no trees tall enough to give them the least security in nesting; no large preserved woods where, under protection of landed proprietors, they might find a refuge. The small occupiers bear a grudge against them for the occasional loss of a chicken. One gentleman, whose keeper persecutes them, might perhaps be induced to give orders for them to be left alone. If one small wood could be protected, the safe breeding

of at least one pair would be secured. The Raven and Buzzard still hold their own fairly. I have known nine nesting sites tenanted this year by the former bird, and could point out a district where a dozen pairs of Buzzards may be found breeding within a three-mile radius; but the Kite, from its mode of nesting, is more exposed to danger. The farmer who showed me the eggs had been familiar with Kites in this locality for thirty years or more. He told how, ten or twelve years ago, he had counted fourteen Kites as they came to roost in the wood where the first nest was built, and how he once saw nine perched on a tree in a neighbouring gully. Once also he had seen an albino Kite. I fear that, unless naturalists will exert themselves on its behalf, the end of the century will see the extinction of the Kite in Wales.—J. H. SALTER (University College, Aberystwyth).

[We entirely concur in the remarks of our correspondent, and would willingly co-operate in any scheme to secure the protection of the few pairs of Kites which still linger in their ancient breeding haunts. Perhaps a memorial to the landowners urging forbearance on the part of their keepers, signed by a number of naturalists, might have the desired effect.—ED.]

Fertility of the Meadow Pipit in Norway.—Having lately found seventeen nests of *Anthus pratensis* on the Norwegian fells, I give the number of eggs found in them, showing an average of 5.53 eggs per nest:—3 nests with seven eggs each; 7 with six; 4 with five; 2 with four; 1 with three. In every case the bird was flushed from the nest, which indeed led to its discovery. In the last case the bird would doubtless have laid more than three eggs. All the eggs were found in June. In Norway the Meadow Pipit, as a rule, nests only on the fells, not on low ground as in England, though on one occasion I found a nest near Stavanger less than 200 feet above the sea.—JOHN P. THOMASSON (Woodside, Bolton).

Hobby in Worcestershire.—On May 7th, whilst strolling through one of the largest coverts in this county, I found a male Hobby with its wing broken, and, strangely, it was fluttering beneath the nest of a Sparrowhawk containing two eggs. I have since sought diligently to find them breeding here, but in vain, although I have enquired from the keepers, who know of two sorts of hawks only. Still I hope to meet with the bird again, and I think a reward offered for a nest shown, and a further reward when proof is given of the young birds having flown, will go some way to protect this little falcon from its otherwise certain doom.—J. STEELE ELLIOTT (Dudley).

Montagu's Harrier nesting in Cambridgeshire.—It may interest some of your readers to know that Montagu's Harrier, *Circus cineraceus*, has been breeding once more in the fens near Cambridge this summer.

There were at least three birds, two males and one female, of which I had a good view. The nest of one pair was found, and consisted of a slight mat of dried sedge, with a few small sticks, about two inches thick, round the outer edge. It was of an oval form, measuring 18 inches by 12 inches, with a slight rounded depression in the centre 6 inches across, in which were three eggs.—F. E. SWAINSON (Jesus College, Cambridge).

Crane in Suffolk.—An adult Crane, *Grus cinereus*, in somewhat abraded plumage, but apparently a wild bird, was shot at Benacre Hall, near Lowestoft (Sir Alfred Gooch's place), on the 27th of June last, and is at present in the hands of Mr. Bunn, taxidermist, Lowestoft, for preservation.—E. BUTLER (Herringfleet Hall, Lowestoft).

INSECTS.

Origin of the Name "Dor-beetle."—I have looked into a good many entomological works with a view to ascertain the origin of the name "Dor-beetle," but without success. The popular impression seems to be that the name is derived from the sound produced by the insect when on the wing. Ogilvie, in his 'Imperial Dictionary' (ed. 1882), gives "Dor, dorr, from A.S. *dora*, drone," and adds:—"The name is probably imitative of the sound the insect makes." Under the heading "Dormouse," Professor Skeat, in his Etymological Dictionary, observes:—"The prefix is from a prov. E, *dor*, to sleep, appearing in *dorrer*, a sleeper, or lazy person." A very different interpretation is that given by Archdeacon Nares, in his 'Glossary' (1822). "To give the *dor*," he says, "is to make a fool of a person; to pass a joke upon him or to outwit him." The word is used in this sense by Fletcher ('Purple Island,' v. 4; vii. 25), and by Ben Jonson (Bart. Fair, iv. 2), in the line:—"Here he comes, whistle; be this sport called *dorring* the dott'rel." This, to an ornithologist, is a very suggestive line, in view of the ancient method of outwitting dotterels, for it conveys a hint that the expression in regard to the *daring* of larks, used by Shakespeare (Hen. VIII. iii. 2) and others, may be a corruption of *dorring*. But to return to the *dor*-beetle. Halliwell, in his 'Dictionary of Archaic and Provincial Words,' has "*dor*, a drone or beetle," and "to *dor* or to give the *dor*, to make a fool of one, corresponding to the modern *hum*, to deceive." But there is yet another and a very different explanation which has been offered by Mr. R. G. Haliburton, incidentally, in some 'Notes on a Tau Cross on the Badge of a Medicine Man of the Queen Charlotte Isles.' Mr. Haliburton says this badge is noteworthy, as Queen Charlotte Isles form one of the most isolated groups of the Northern Pacific. They lie off the west coast of British Columbia. This symbol was used by the Indians on large sheets of copper, to which they assigned a high value, and each of which they called a *Tau*. The connection of that name with the symbol

is world-wide. Our T is simply the *tau* symbol, and is called *tee* or *tau*. The medicine men represent the *tau* sometimes on the forehead. The ancients used to mark the captives who were to be saved with a *tau* or cross; Ezekiel refers to this, and the word he uses for "the sign" to be marked on the foreheads of them that are to be saved, really is the "*tau*" or "cross." No one had divined why the *scarab* was so sacred. He was led to a solution by seeing an exaggerated *tau cross* on the back of a *scarab*. On looking into the Egyptian name for the *scarab*, he found it to be *tore*, and that the sutures on the beetle form a *tau cross*. Wilkinson represents a god with a *scarab* for a head, one of the names of which was *Tore*. Apparently the same name is applied in this country by our peasantry—*tor-beetle* or *dor-beetle*. The use of the pre-historic or pre-Christian cross is world-wide. This is an ingenious and plausible explanation, and one that deserves to be made known to English naturalists; but whether it will be acceptable to those of them who are philologists is a question upon which some expression of opinion would be interesting.—
J. E. HARTING.

NOTICES OF NEW BOOKS.

Castorologia: or the History and Traditions of the Canadian Beaver. By HORACE T. MARTIN. 8vo, pp. 238. With illustrations. London, Stanford; Montreal, Drysdale & Co.

UNDER the infelicitous name of 'Castorologia,' almost as suggestive of a disagreeable plant as of an animal, Mr. Martin has brought together a good deal of interesting information upon a subject upon which we have had no separately published treatise since that of Morgan.* He is not really responsible for the invention of the word in question, but only for its adoption; since so long ago as 1685 a Latin treatise by one John Marius appeared at Augsburg with the title 'Castorologia explicans Castoris animalis naturam et usum medico-chemicum.' This of course related to the European Beaver, and chiefly to the medicinal properties of the so-called "castoreum," which was then held in great esteem as a panacea for all sorts of ailments.

The European and American Beavers were long thought to be specifically identical, until, in 1825, F. Cuvier pointed out the

* 'The American Beaver and his Works,' 1868.

differences which are to be found in the shape and relative length of the nasal bones. Mr. Martin, recognising these as good specific characters, treats of both forms in his book, but naturally devotes the larger share of attention to the Canadian animal, with which he has had better opportunities for becoming acquainted. His account of the European Beaver, in fact, is extremely meagre; and although a chapter is devoted to it, this extends to no more than three pages, and deals very inadequately with the present distribution of the animal in Europe, a subject which was dealt with in much greater detail some few years ago in this Journal (Zool. 1886, pp. 265—286).

The discovery of the Canadian Beaver was, naturally enough, coincident with the discovery of Canada, and the animal proving to be a source of wealth, on account of its valuable skin, its effigy became adopted as a national symbol. But it was not until the establishment of the fur-trading posts at Quebec in 1604, and at Montreal in 1611, that this commercial importance was seriously considered, and the destruction of the Beaver colonies commenced, not only in Canada, but around Hudson's Bay and the shores of Lake Superior, the head waters of the Missouri and the Seskatchewan, and upon the tributaries of the Columbia. The regions bordering on the Yukon, on the upper part of Mackenzie River, on Frazer's River, and on the Sacramento, were also noted for Beavers.

The term "Canadian Beaver" is too restrictive, seeing that there is but this one species in the New World, and that its distribution is uncommonly wide, ranging from the confines of the Arctic Sea on the north, to the Gulf of Mexico, the Rio Grande, and the Gila rivers on the south; and even southward of these ranges, in Tamanlipas in Mexico, which is the southernmost point to which it has been definitely traced. Throughout all the intermediate area, from Hudson's Bay and the Atlantic on the east to the Pacific on the west, it has been found generally distributed.

In his chapters on the life-history of the animal (pp. 45—48) and its engineering accomplishments (pp. 63—77), Mr. Martin does not add much to what was already well known, and on some points still unsettled he gives no information. For example, in the first of these two chapters he does not describe the condition of the young at birth, nor state whether they are born blind or

not; and the absence of an index hinders the reader from ascertaining whether this point is touched upon elsewhere.

The attempts which have been made at various times to preserve the Beaver, both in Europe and America, form the subject of another chapter, and the opposite methods adopted in the two continents are thus contrasted (p. 168):—

“The great difference between the attempts of the white man to perpetuate the beaver and the method adopted by the Indian is all the difference between art and nature. The white man has made artificial enclosures for the beaver; the Indian reserve was a natural beaver district, chosen by the animals as a suitable home and guarded by the Indian from encroachment. Of the regard which beavers had for certain localities Charlevoix says, ‘There are some places that the beavers seem to have such an affection for that they do not appear able to leave them, although they are always uneasy there. On the way from Montreal to Lake Huron by the great river, one never fails to find every year at the same place a lodge which these animals build or repair every summer; for the first thing the voyageurs do who arrive there earliest, is to break the lodge and the dam which provides it with water.’ The Hudson’s Bay Company showed their wisdom by adopting the Indian methods of dealing with nature, and in proportion to the closeness with which they follow these methods so is the measure of their success. They have systematically set aside certain islands along the coast of Hudson’s Bay as beaver reserves, those favoured most by the beaver being chosen. We have seen how every third year a family of beaver kittens matures, and the Company considers it wise to visit these islands every third year and carefully gather a crop of beaver pelts, representing the approximate increase based on the known habits of the animals. This triennial hunt is conducted in the most orderly and scientific manner, so as not to disturb the colonies, and those who have accompanied the parties give astonishing accounts of the condition of things witnessed, the beavers having almost completely lost their fear of man, and their works assume the most elaborate proportions. The time will soon come when these reserves will be worked over, and then the limitations will bring about the inevitable result, a sudden disappearance of the busy hosts.”

Amongst other subjects discussed, Mr. Martin deals with the mythology and folklore of the Beaver, and its connection with heraldry, but in a fragmentary, scrappy kind of way, too suggestive of paste and scissors. Indeed the volume may be described as a scrap-book of Beaver-lore, wherein the author, in his anxiety to collect all he could find on the subject, has often shown more industry than discrimination.

The poetical effusions which are scattered throughout the book, some of which occupy two or three pages, and the long extracts from Longfellow's 'Hiawatha,' might well have been omitted. We could have dispensed also with various quotations, from Lord Bacon to Miss Arabella Buckley, which are dragged in here and there, and which, having no particular bearing upon the nearest remarks of the author, are printed separately on an opposite page. Divested of this "padding," Mr. Martin's book would be no less useful, and in any new edition a re-arrangement of the chapters would be desirable; for the various subjects dealt with are not arranged in any natural or logical sequence. Mr. Martin commences with Mythology and Folk-lore, and ends with Heraldry. In Chapter V. he deals with the life-history of the animal, and yet defers his remarks on its anatomy and osteology until Chapter XIV., discoursing in the meantime on such topics as "Geographical distribution," "Chemico-medical properties," "Importance in trade," and "Uses in manufactures."

In an "Appendix" we have some photo-copies from original documents, and an extract of so much as relatés to the Beaver in Samuel Hearne's account of his journey from Prince of Wales's Fort, in Hudson's Bay, to the Northern Ocean; undertaken by order of the Hudson's Bay Company in the years 1769—1772.

Wild Spain: Records of Sport with Rifle, Rod and Gun, Natural History and Exploration. By ABEL CHAPMAN and WALTER J. BUCK. With 174 Illustrations, mostly by the Authors. 8vo, pp. 472. London: Gurney and Jackson.

THIS is not a romantic account of a single visit to Spain. For more than twenty years the authors have undertaken sporting expeditions into various parts of that country, chiefly in Andalusia, but including, at one time or another, nearly all the western provinces from the Mediterranean to Biscay. A love of wild sport has been perhaps the leading motive; but the study of Natural History has hardly been of secondary importance. In pursuit of these objects the authors have spent weeks, sometimes months, at a time in the sierras and wildernesses of Spain, bivouacking wherever night overtook them or the chances of

sport might dictate, and camping out on the glorious snow-clad cordilleras.

Their subjects, as they tell us in their Preface, are the wild-life and *feræ naturæ* of the Peninsula, including in the latter expression, by a slight stretch of the term, the brigand and the gipsy, with remarks on agriculture as cognate and supplementary. As far as convenient, the sequence of chapters follows the changes of the season, commencing with spring time. Hence the earlier part of the book is more concerned with Natural History—though the pursuit of Ibex and Bustard may be followed in spring—while the latter half is more exclusively devoted to sport.

Long residence in Spain afforded opportunities which are not available to the ordinary traveller, and this was especially the case with sport, of which at times the authors have enjoyed some of the best that Spain affords. But it should be remarked that many of the shooting campaigns described have been on private and preserved ground; and while they naturally select the more fortunate records, they pass over in silence many a blank day.

It is as well to bear in mind that in Spain nearly all ground on which large game is found is preserved, with the exception of remote parts of the sierras, where Wild-boar and Roe-deer may be shot, and those higher mountain ranges which form the home of Ibex and Chamois. While indicating in general terms the distribution of the various game and other animals, the authors have in many instances prudently abstained from naming precise localities.

From this it will be gathered that the account here given of natural history and sport in Spain is the outcome of considerable experience, and that, so far as it goes, therefore, it is perfectly reliable. More than this, it is of an extremely varied and interesting nature, as a mere glance through the contents is sufficient to show.

After an account of Andalusia and its mountain ranges, we have a description of a boar-hunt in the sierras, and another of some "big-days" with Bustard. These are excellent, as are also the illustrations which accompany them. The history of the "fighting bull" of Spain, that is, of the animal used in the bull-fights, the various breeds, and mode of rearing, will be of interest to those who take an interest in cattle, though they may not see any good reason for upholding the national sport.

Wild Camels in Spain have a chapter to themselves, and although this subject is not new, having been discussed some years ago both in 'The Field,' and incidentally in 'The Ibis,' by Mr. Chapman and others, the opportunity is now taken to review the facts, and to give some explanatory touches to former statements.

Sport and natural history are pleasantly intermingled in the chapters on the Spanish Ibex (pp. 128—166), the Great Bustard (pp. 33—57 and 338—342), and the Little Bustard (pp. 343—347); Deer-driving in the pine forests; Deer-stalking on the southern plains; Wildfowling, and Trout-fishing; while hardly less attractive are the chapters on bird-life as observed at different seasons, including the authors' experience with the great Lammergeier, with Eagles, and with Flamingoes.

From the point of view of the zoologist, perhaps one of the most useful chapters in the volume is that on the large game and smaller mammals of Spain and Portugal, in which an account is given of the present status and distribution in those two countries of the Red-deer, the Fallow-deer, Roebuck, Spanish Ibex, Chamois, Bear, Wild-boar, Wolf, Fox, Spanish Lynx, Wild Cat, Genet, Marten, Polecat, Weasel, and Mongoose. Only one kind of Marten, we are told, is found generally throughout Spain, namely, *M. foinea*, which is common in Andalusia, Estremadura, and Valencia, as well as in the Asturias and Santander, but the authors state (p. 448) they have reason to believe that the *marta* of the Pyrenees is the rarer Pine Marten, which, by the way, they name *Mustela abietum*, though *Martes sylvatica*, Nilsson, is its more correct designation; the arboreal species of the Weasel family, genus *Martes*, being properly separable from the terrestrial group to which the genus *Mustela* belongs.

In a book so full of delightful passages, it is extremely difficult to make a selection for quotation, and we shall not attempt it. We prefer rather to recommend the perusal of the entire volume, which is one of the best books on natural history and sport which we have seen for some time.

OBITUARY.

FRANCIS POLKINGHORNE PASCOE, F.L.S., &c., was born at Penzance on Sept. 1st, 1813, and died at Brighton on June 20th, 1893. He was educated at the Grammar School of his native town, and subsequently entered at St. Bartholomew's Hospital as a student. He was admitted M.R.C.S. in 1835, and soon afterwards obtained an appointment in the Navy as Surgeon, serving on the Australian, West Indian, and Mediterranean stations. In 1843 he married Miss Glasson, of Falmouth, and retired from the service, settling near St. Austell, in the vicinity of which he had a property producing Kaolin (China clay). He was left a widower in 1851, and then settled permanently in London, and devoted his attention entirely to Entomology and Natural History generally. But until lately he travelled much, either alone or in the company of one or more of his daughters, and in this way he traversed nearly over the whole of Europe, North Africa, &c., and once made a voyage to the Lower Amazons to make personal acquaintance with the natural marvels of that rich region. As a writer he commenced with a botanical paper in Henfrey's 'Botanical Gazette,' in 1850, enumerating unrecorded Cornish plants. But he mainly devoted himself to Coleoptera, commencing with the Longicorns, on which he published much, including 'Longicornia Malayana,' enumerating and describing the species collected by Wallace, which formed vol. iii. of the third series of the Trans. Ent. Soc. Lond., 1864—1869, containing 712 pp. with twenty-four coloured plates. Subsequently the Colydiidæ and cognate groups, and still later the Curculionidæ, engaged his attention, and the number of his published papers on Coleoptera is very great. His collections of Coleoptera he sold to the British Museum not long before his death, when ill health warned him that he could make no further use of them; we believe they contained above 2500 type specimens of species described by him. For many years he had also accumulated an enormous mass of materials illustrative of a 'Systema Naturæ.' His active mind was never at rest, and latterly he published many small works on the animal kingdom, the most important being the second edition of his 'Zoological Classification' (1880), in which an enormous amount of information is compressed into a small compass. He joined the Entomological Society of London in 1854, and was President in 1864—65, and there was scarcely any more regular attendant at the meetings; was a member of the Entomological Society of France since 1862; and belonged also to the Belgian, Stettin, and other foreign Societies. He became a Fellow of the Linnean Society in 1852, and was for many years on the Council of the Ray Society and the Scientific Committee of the Royal Horticultural Society. It may be said of him that he was never happy save in the company of naturalists.—*Abridged from the 'Entomologist's Monthly Magazine.'*

THE ZOOLOGIST.

THIRD SERIES.

VOL. XVII.] SEPTEMBER, 1893. [No. 201.

THE GREAT BARRIER REEF OF AUSTRALIA.

THE Great Barrier Coral Reef of Australia, the marvellous structure and extent of which were first made known through the explorations of Captain Cook, is one of the wonders of the universe. Its linear measurement is no less than 1250 miles, beginning with its northern origin in Torres Straits, about $9\frac{1}{2}^{\circ}$ south latitude, in close proximity to New Guinea, and thence stretching away as far as Lady Elliot Island, the northernmost true coral islet in the system, situated in the parallel of 24° , somewhat south of the bold mainland promontory known as Bustard Head. Its entire area lies within the territorial jurisdiction of Queensland, of which colony it constitutes one of the most valuable possessions.

Some idea of the monetary importance to Queensland of this great reef may be gained from the fact that raw material from it to the value of over £100,000 is annually obtained and exported from the colony. In the opinion of Mr. Saville Kent, who has lately published a splendidly illustrated quarto volume dealing with this great reef and its products,* this sum probably represents but a fractional part of what it will be worth when the prolific resources of the region have been fully developed. The

* 'The Great Barrier Reef of Australia; its products and potentialities.' By W. Saville Kent, F.L.S., F.Z.S., Commissioner of Fisheries to the Government of West Australia, and late of Tasmania and Queensland. 4to, pp. 387. With 48 photographs and 16 chromo-lithographs. London W. H. Allen & Co. 1893.

items which have contributed in the past, and are likely to contribute in the future, most extensively towards the production of the large income referred to, are the pearl, pearl-shell, and trepang (or *Bêche-de-mer*) fisheries. These, says Mr. Saville Kent, are capable of development to an almost unlimited extent, and, in addition, there are other fishing and allied industries which await but the advent of scientifically applied labour, and the necessary capital, to yield a rich increase to the colony's wealth.

To judge by the information afforded by the volume before us, with its beautifully executed photographs and coloured plates of corals, mother-of-pearl shells, oyster reefs, holothurians, anemones, and fishes of the most fantastic shapes and brilliant colours, Mr. Saville Kent's estimate seems by no means exaggerated. On the contrary, there would seem to be in this great reef a wealth of natural marine productions which, looking to the extensive area and to the process of recuperation which is constantly going on, must be practically inexhaustible. Under these circumstances it is perhaps surprising that no enthusiastic naturalist has until now been found to give some detailed account of these wonderful productions, and attempt with the aid of photography to convey some idea of the remarkable appearance presented by a reef with all its masses of corals and gorgonias, sea-weeds and shells, star-fish and holothurians grouped in endless variety as far as the eye can reach. Indeed it may be said that by no process other than that of photography would it be possible to represent with any degree of accuracy the areas of coral-growths that are uncovered by the sea for such short and uncertain intervals.

Mr. Saville Kent is to be congratulated on the success which has attended his labours, not only in regard to the reproduction of his very beautiful photographs, but in regard also to the valuable information which he has collected in the course of his explorations, and which is now published. His first chapter is devoted to a detailed description of the photo-type plates, which need only be seen to be admired. In the second chapter he deals with the general structure of coral reefs and theories of origin. "The reef-forming corals," he says, "owe their solidity and extensive dimensions to the fact that they represent, for the most part, the united, or, more correctly, imperfectly separated

coral skeletons or 'coralla' of a great number of closely associated sea-anemone-like polyps. The closely aggregated clusters of our commoner British species, such as the strawberry (*Actinia mesembryanthemum*), the daisy (*Sagartia bellis*), and the opelet anemone (*Anthea cereus*), as they repose extended in their beauty in some clear rock pool on, say, the Devonshire, Welsh, or Channel Islands coast, have been a frequent source of admiring wonder. The majority of the clusters have been formed by the repeated subdivision, or technically termed 'fission,' of a single primary anemone or polyp. Supposing that these clustered anemones secreted a calcareous coral basis, and, in place of becoming entirely separated from one another, remained united by their basal, skeleton-secreting tissues, we should have in this hypothetical compound organism a precise presentment of the structural organisation of a typical reef-forming coral."

The highest elevation at which corals are found growing within the Barrier-reef area is that of about ordinary low-water mark. Thence downward to a depth of from twenty to thirty fathoms represents the generally recognised bathymetrical range of reef-coral growth. Their most luxuriant development, however, is limited by a depth of about fifteen fathoms from low-water mark—an area that corresponds essentially with what is known as the Oar-weed or Laminarian zone of European and other temperate seas.

The specific varieties of coral-reefs that receive universal recognition at the hands of biologists are, as originally classified by Mr. Darwin, referred to three distinct categories. These are—(1) Lagoon islands, or Atolls; (2) Barrier- or Encircling-reefs; and (3) Fringing- or Shore-reefs. Dealing with each of these in turn, Mr. Saville Kent proceeds to discuss Mr. Darwin's theories of reef formation, and to compare them with the views of more recent writers on the subject who have been unable to accept them.

Then follows a consideration of the general structure and most probable mode of origin of the Great Barrier Reef of Australia, the most colossal of its kind. This is, naturally, one of the longest chapters in the book, and a very interesting one; inasmuch as the evidence afforded by this great reef is for the first time fairly and fully considered with a view to explain the divergent views held by Mr. Darwin and Dr. John Murray in

their respective theories of origin of coral reefs. The remarks on the evidence which exists of a former connection between New Guinea and North Queensland (pp. 132, 133) are particularly instructive.

In Chapter V. (pp. 139—203) we have a detailed and beautifully illustrated account of corals and coral animals, succeeded by another on pearl and pearl-shell fisheries, the annual value of which is estimated at £70,000. This industry is confined to the tropical area of the Queensland coast-line, or, in other words, is essentially associated with the Great Barrier district. Its headquarters are at Thursday Island, Torres Strait, the northernmost point of the Australian continent. All the licenses for vessels, boats, and men employed in this fishery are taken out at Port Kennedy, Thursday Island; and from this centre shelling expeditions are made along the mainland coast line to the northern limits of the Great Barrier Coral Reef, and throughout Torres Strait northwards to the vicinity of New Guinea. Of late years pearl-shell has been also obtained in some quantity on the east shore of Cape York peninsula in the Gulf of Carpentaria. The average depth of water from which the greater quantity of mother-of-pearl shell is at present collected is seven or eight fathoms. Twenty fathoms represent about the greatest depth from which the shell is profitably fished, although few divers can stand the strain of prolonged work under that pressure. In former years it was abundant, and even now is occasionally obtained, in such shallow water as to be gathered by the hand at low spring tides.

The very best shell fetches from £8 to £9, and the worst about £3 per cwt. The species which bears this commercial value is *Meleagrina margaritifera*, the typical mother-of-pearl and pearl-producing shell of the Indian and Pacific Oceans. Two varieties, the one with a golden edge, the other having a silvery or nacreous consistency throughout, are pretty evenly intermingled, and do not, so far as the author's investigations have extended, present any marked distinction in the aspect or structure of the contained animal. The last-named variety having the nacreous lining, or true mother-of-pearl, pure and uniform throughout, is the more valuable, as it cuts up to greater advantage, and for commercial purposes the purest white shell invariably commands the highest price.

Of the *Bêche-de-Mer* Fisheries, Mr. Saville Kent gives a very interesting account (pp. 225—242), from which we extract the following:—

“*Bêche-de-mer*, Sea-slugs, Sea-cucumbers, or Trepang, as the reef-frequenting animals dealt with in this chapter are variously designated, represent an ordinal group, that of the *Holothuridæ*, which belongs systematically to the class of the invertebrate sub-kingdom which is distinguished by biologists under the title of the Echinodermata. The term *Bêche-de-mer*, by which the organisms are now most generally known in trade circles, is the French form of the older title of *Bicho-do-mar*, signifying a sea-worm or sea-slug, which was suggestively applied by the older Portuguese navigators to that marine produce which from the earliest times has constituted so important an article of commerce in China and the Malayo-Polynesian region generally, where it is better known under the colloquial title of Trepang. Sea-slugs and Sea-cucumbers are Anglo-Saxon titles, having reference to the general shape of the animals, and they have been applied popularly to various allied species, mostly smaller, and having no commercial value, which are indigenous to British waters.

“The class Echinodermata includes, in addition to the original group of the *Holothuridæ*, or *Bêche-de-mer*, all the innumerable varieties of Star-fishes and the spine-bearing Sea-urchins or *Echini*. The fundamental structure in each of these orders is identical. This may be most readily understood by an examination of their organs of locomotion, which are found, in each of the allied groups mentioned, to consist of a series of extensile tubular organs, ‘ambulacra,’ which terminate in adhesive suckorial disks, and are not possessed by any other class of the animal kingdom. The representatives of the *Holothuridæ*, or *Bêche-de-mer*, are distinguished from their allies, the Star-fishes and Sea-urchins, by their elongate, somewhat cucumber- or sausage-shaped bodies, which, in all the commercial forms, are capable of great contraction and extension. The mouth, which is situated at one extremity of the body, is surrounded by a series of plumose or tufted tentacles; a circular or pentagonal aperture at the opposite end is the vent.

“The food of *Bêche-de-mer* consists chiefly of the microscopic calcareous-shelled animals known as *Foraminifera*, which are swallowed in combination with a large percentage of sand and broken fragments of shells and corals. The process of feeding, as observed by the author in a large number of varieties, is in all cases identical and somewhat remarkable. The tufted, mop-like tentacles are one by one swept over the surface of the ground or reef upon which the animal is feeding, and in corresponding order they are recurved towards the mouth, and thrust with the adherent food-matter down the creature’s throat; in reverse order they are extended to annex more pabulum.

“The largest-sized commercial *Bêche-de-mer* obtained from Queensland waters is the ordinary ‘Prickly-fish’ or ‘Prickly-red,’ *Stichopus variegatus*, which, in its fully-extended state, may measure four feet or more in length, with an accompanying diameter of four or five inches. Eighteen inches is the more ordinary extended length of black, red, and teat-fish. In all instances these organisms are capable of contracting to about one-half of their extended length, the body under contraction becoming of course thicker.

“The process by which *Bêche-de-mer* is prepared for the market in Queensland is as follows:—The ‘fish’ are first collected in sacks by wading or diving off the reefs during the low spring-tides. They are then, immediately on their arrival at the dépôt, or curing-station, placed in large iron cauldrons, and boiled for twenty minutes. They are next taken out; split up longitudinally with a long, sharp-pointed knife; gutted; and exposed on the ground in the sun until the greater portion of the moisture has evaporated. The largest specimens, such as prickly- and teat-fish, are frequently spread open, so as to dry more readily, with small transversely-inserted wooden splints. The greater amount of moisture having been got rid of, the fish are transferred to the smoke-house. This is usually composed of corrugated iron, ten or twelve feet high, and fitted, in its upper half, with two or three tiers of wire netting, upon which the *Bêche-de-mer* are laid. The wood most in favour for the smoking process is that of the red mangrove, *Rhizophora mucronata*. Twenty-four hours is the usual period for which *Bêche-de-mer* are left in the smoke-house. By the end of that time they have for the most part shrunk to a length of six inches or less, and in aspect they may be likened to charred sausage. They are then ready for bagging up and despatched to the nearest market.

“An essential matter, that demands the most careful attention of those engaged in the *Bêche-de-mer* fishery, is the maintenance of the cured fish in a thoroughly dry condition. The prepared produce readily absorbs moisture; should it get wet, or have been insufficiently cured, it has a tendency to dissolve into a tenacious, glue-like mass of the most repulsive aspect and abominable odour. Properly cured, and maintained in a first-class condition, the dried animals (to use a trade expression) should rattle like walnuts in their bags. To insure their delivery in the Hong Kong market in the same prime condition, the precaution is sometimes taken of transporting them in tin-lined cases.

“The fishery for *Bêche-de-mer* is carried on chiefly by means of small luggers of five or six tons burden. These make daily voyages from the curing-station to the neighbouring reefs, which are exposed only at low water; or a fleet of them may remain in the vicinity of the reefs, one or more acting as tenders to convey the fish to the curing-station and to bring back supplies.”

In regard to their annual export value the oyster-fisheries of Queensland occupy the third position upon the list of the leading fishery industries of the colony. "Pearl shell" takes the lead, with an average yearly export value of £70,000. The *Bêche-de-mer* yields in like manner an average of £23,000, while the oyster-fisheries for the past ten years have not exceeded an average of £8000, but almost half as much again may be set down as the value of those for home consumption, bringing the total for oysters to about £12,000.

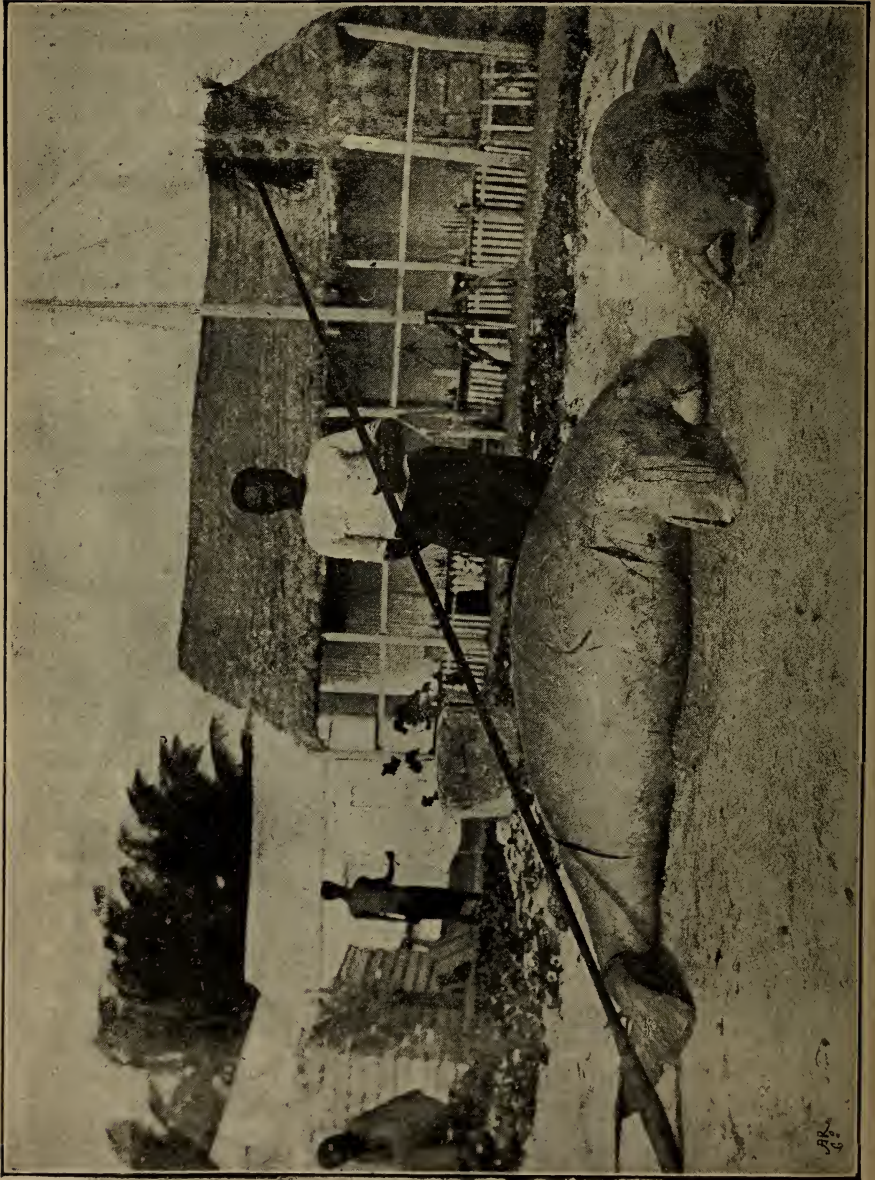
There is but one species of oyster of any commercial value in Queensland, namely, the so-called "rock-oyster," *Ostrea glomerata*; but of this form there are, as might be expected, several varieties, which are duly described.

Mr. Saville Kent states that the largest edible oyster is that known as the cockscomb-oyster, *Ostrea crista-galli*, a salt-water form restricted to the tropics, and found plentifully among the coral reefs of Torres Strait and the Great Barrier system. A pair of its shells will weigh from 5 to 7 lbs., and have a diameter of from 8 to 12 inches.

As to the antagonism of star-fishes and oysters, the author observes —

"Star-fishes of all descriptions, but more especially the ordinary five-rayed varieties, *Asteriadae*, are universally held up for condemnation, as representing the most insatiable foes of the oyster tribe. Whether this wholesale condemnation is a just one, there are some reasons for doubting. In many instances it has been observed that the Star-fishes were merely acting as scavengers, and preying on dead or dying bivalves. The direct experiment was carried out by the author, some years since, in one of the large English public aquaria, of keeping oysters and star-fish, including the accredited most aggressive species, *Asterias (Uraster) rubens*, in the same tank. The pre-supposed aggressors and their helpless victims were thus maintained, side by side, in perfect health, for many months, without a single instance occurring of molestation of the oysters on the part of the Star-fish. The Echinoderms, however, demonstrated their possession of normal healthy appetites by feeding freely on portions of cut-up fish occasionally placed in the tanks. How far this vindication of the Star-fish's character would hold good in association with the common shore species of South Queensland has yet to be demonstrated.

"In the interim it is desirable, in the interests of the oyster grower, to recommend the clearance of this intruder as far as possible from off his beds or banks. In this connection, a suggestion concerning the destruction



NATIVE CHIEF OF JERVIS ISLAND, TORRES STRAIT, AND DUGONG KILLED WITH THE SPEAR

AR
6

of Star-fish may prove acceptable. It is by no means an uncommon practice among oyster cultivators, on bringing up Star-fish in the dredge, or finding them on the banks, to rip them in pieces and cast them aside, or into the water again, under the impression that their life is destroyed. As a matter of fact, each of the five finger-like processes separated from the Starfish's body is capable of growing into a fresh Star-fish, so that by the process of dismemberment the further multiplication of the species is accomplished. If only the lambs' tails, docked by the Australian pastoralist, could be induced to re-grow the lamb on the same happy principle, millionaire squatters would soon become a drug in the market. To encompass the certain destruction of the Star-fish, it is desirable that they should be carried to land and be deposited above the reach of the tide. They may also be killed immediately by immersion in fresh water.

Queensland possesses a fish-fauna as remarkable for the number of species as for their structural variety. The number authoritatively recorded, including fresh-water as well as marine forms, falls but little short of 900, of which about one-third are edible. Anchovies and herrings abound, and some species of this family (*Clupeidæ*) attain a length of 4 or 5 feet. The reef eels, which are sometimes 20 feet long, are more dreaded by the collectors of *Bêche-de-mer* than even the sharks. As to the introduction of salmon, Mr. Saville Kent is not sanguine; for he regards the failure of the attempts made in this direction as due to temperature which cannot be controlled. Of 35,000 young salmon, hatched and distributed amongst the Australian rivers in 1844, not one is known to have returned from the sea, the reason being that the marine temperature corresponds with that of the coast of Europe which is outside the limits of Atlantic salmon distribution. The experiment has failed in Australia for the same reason that it did in the South of France.

The photographs of Barrier Reef fishes, giving figures of nearly forty species, are excellent.

We are unable to speak so favourably of the chromolithographs, of which there are sixteen; two of Reef fishes, the remainder depicting Anemones, Corals, Echinoderms, *Bêche-de-mer*, and Reef oysters. The drawings are hard and flat, the colouring crude; there is a want of shading necessary to give rotundity of form, and, where two vivid tints meet, there is no gradual blending, no delicate transition such as is observable in Nature. This is a general defect in illustrations similarly

produced; but from what we know of chromo-lithography, we are inclined to think that these plates might have been very much better done.

Among the fisheries of the Great Barrier and Torres Strait districts, those of Turtle and Tortoise-shell are in a comparatively latent condition. The Edible Turtle, *Chelone mydas*, abounds in these waters, and breeds on the sandy shores of the coral islets. Except, however, for local consumption, and the export of a limited number to Sydney and Melbourne, little or nothing is done with this valuable item of commerce. One method of capturing turtle by the natives of Torres Strait, although not described for the first time, is remarkable, and may be new to some of our readers.

The large Sucking-fish, *Echeneis naucrates*, which grows to a length of 3 or 4 feet, and is called by the natives *Japu*, is kept alive at the bottom of a native canoe, a thin line being fastened round its tail and through its gills. On a turtle being sighted near the canoe, the sucking-fish is thrown out towards it, and immediately swims to and fastens upon its carapace. If the turtle be a small one, or of medium size, it is hauled in by the line, the fish retaining its tenacious hold; but if it be a large one, a native jumps overboard with a stronger line, and following the smaller one down secures the turtle.

The trade in tortoise-shell in this part of the world is not sufficient to constitute an independent industry, the greater portion of that which is collected being obtained in a desultory manner by those engaged in the *Bêche-de-mer* trade. Nevertheless the average annual value of the tortoise-shell exported from Queensland within the past ten years has slightly exceeded £400. The most valuable description, procured from the Hawk's-bill Turtle, *Chelone imbricata*, will realise from 20s. to 25s. per lb. The thinner and inferior shell from the Edible Turtle, *Chelone mydas*, will not fetch more than 4s. or 5s. per lb.

We have yet one more subject of interest to notice before closing this sumptuous volume.

A highly characteristic Barrier Reef animal is the Australian Dugong, *Halicore australis*, technically referred to a distinct herbivorous order of the Mammalia known as the *Sirenia*.

The average length of the Dugong when adult is from 8 to 10 feet, though it occasionally reaches 12 feet in length.

It is gregarious in its habits, and is found in herds numbering from ten or a dozen to thirty or forty individuals, mostly females. Its food consists almost exclusively of the *Zostera*-like marine grass, *Posidonia australis*, which grows in great abundance about the reefs of the intertropical coast line.

The chief value of the animal, which is eaten by the natives, depends upon the oil it yields, which, for medicinal purposes, used to realise first hand 20s. per gallon, but which now fetches about 12s. per gallon. It is captured both by netting and spearing. The Dugong spear used in Torres Strait is a formidable weapon, being, as originally described by Prof. A. C. Haddon, a pole from twelve to fifteen or more feet in length, with its butt-end club-shaped and hollowed for the reception of a loose-fitting barbed dart, to which a long line is attached. The opposite end of the shaft is usually perforated, and decorated with tufts of cassowary-feathers, ovula shells, or rattling seed-pods.

Through the kindness of Messrs. W. & H. Allen & Co., the publishers of this work, we are enabled to give a reproduction of an excellent photograph, taken by Prof. Haddon, of a native chief of Jervis Island, Torres Strait, with two Dugongs killed by him with the long spear above described:—

“When close enough,” says Prof. Haddon, “the man bearing the spear jumps into the water, at the same time harpooning the Dugong as it is in the act of breathing. The latter immediately dives down, and runs out the rope which is fastened to the dart, the man having to be careful not to get his head entangled in the loops of the rope, as deaths have occurred from this accident. The man returns with the spear-shaft to the canoe. Other men immediately dive into the water, and when the Dugong once more rises to breathe, they tie a second rope round its tail, and then, whenever it attempts to rise, the men by diving at the same time, pull it down with the rope, and in a very short time it is suffocated. Death always occurs through asphyxia.”

With this extract we must conclude our notice of this very beautiful and instructive volume. The amount of information which it contains concerning the animal-life to be found on and around the Great Barrier Reef of Australia is considerable, and while, from the style in which it is written, the volume is attractive to the general reader, it furnishes in its systematic and accurate details a very important contribution to zoological science.

THE "RUSSET-PATED CHOUGH" OF SHAKESPEARE.

BY THE EDITOR.

IN a review of 'The Ornithology of Shakespeare' which appeared in 'Nature,' 28th Dec. 1871, the reviewer observed that "Without doubt the poet had in his mind the real Cornish Chough, and the expression is quite accurate. 'Russet-pated' is having red pattes, or feet (*cf.* the heraldic *croix pattée*), not a red pate or head, a feature equally inapplicable to Chough or Daw, while the red feet of the former are as diagnostic as can be."

The late Edward Newman, struck apparently by the ingenuity of this criticism, in an editorial note appended to a review of the same book which appeared in 'The Zoologist' for 1872 (p. 2939), adopted this view as "unquestionably the true explanation." The suggestion had been long previously made by Edward Turner Bennett in 'The Zoological Journal' for 1835 (vol. v. p. 496), and within the last few weeks it has been once more revived (p. 87, note), and approved (p. 132, note), in the first part of Professor Newton's 'Dictionary of Birds,' recently published by Messrs. Black.

Unwilling as I am to differ in opinion from so excellent an authority in matters ornithological, I am so entirely unable to accept this explanation, that I am tempted to try and set down a few reasons for my inability to agree with him.

It will be remembered that the passage occurs in the 'Mid-summer Night's Dream' (Act iii. sc. 2), wherein Shakespeare refers to—

"Russet-pated Choughs many in sort,
Rising and cawing at the gun's report."

My contention, in 'The Ornithology of Shakespeare' (pp. 118, 119), was, and still is, that the bird intended by the poet was not the red-legged Chough, but the grey-headed Jackdaw.

In support of this contention, it will be necessary for me to prove (1) that the name *chough* was not exclusively bestowed upon the bird with red bill and red legs, but was also commonly applied to the Jackdaw; (2) that "pated" means "headed," and cannot be read "patted" for "footed"; (3) that "russet" is not red, though it may be "reddish," and is often

used for "gray," the material "cotton russet" being of that colour; and (4) that the habit of the birds referred to by Shakespeare as "many in sort, rising and cawing" indicate a mixed flock of Jackdaws and Rooks, and not Choughs and Rooks: an assemblage of the former kind being commonly observable; of the latter kind never—so far, at least, as my experience goes.

(1) That the word "Chough" was not always intended to refer to the bird with red bill and legs may be inferred from the context in several passages by different writers, a few of whom I will quote. Palsgrave, in his 'Lesclaircissement de la Langue Francoyse,' 1530, has "Choughe, a yong crowe, *corneille*."

In 'The Churchwardens' Accounts of the Town of Ludlow in Shropshire, from the year 1540 to the end of the reign of Elizabeth,' printed for the Camden Society, we find the following entries relating to the Chough, by which name the Jackdaw is evidently intended:—

"Item, payd unto Mr Beekes man the 28 of May 1569 ffor vj chohes heades, jd "

And again, between 1586 and 1587, we have—

"Item, paied to Richard Higges for stoppage choughes out of the church iiii d "

Now as the Jackdaw, as readers of 'Ingoldsby' will remember, is "a great frequenter of the church," and commonly builds in church towers, while the red-legged Chough is never found in such a situation, there cannot be a doubt as to what species of bird was referred to by the Shropshire churchwardens in the 16th century.

O'Flaherty, describing the birds to be met with in "West or H'Iar Connaught" in 1684, clearly distinguishes the Jackdaw from the red-legged bird, though he calls them both "choughs." He observes (p. 13):—

"I omit other ordinary fowl and birds, as bernacles, wild geese, swans, cocks of the wood, woodcocks, *choughs*, rooks, *Cornish choughs with red legs and bills*," &c.

The name "chough" therefore was not exclusively applied to the red-legged species.

(2) The word "pate," synonymous with "head," occurs in Shakespeare's plays at least fourteen times; "pated" but once, and that in the passage now under discussion. It is not in the

least degree probable that Shakespeare in this place intended to convey a meaning wholly at variance with that indicated in every other passage in which the word "pate" has been used by him. Moreover, although I have read the plays of Shakespeare three times through, I have failed to discover a single instance in which the poet has used the word "pated" for "footed."

As regards the suggestion that this use of the word is supported by the French heraldic expression *croix pattée*, it is not to be denied that here the word *pattée* (from *patte*, a paw or foot) does imply a cross with a foot, in other words a cross the arms of which are narrow at the inner and broad at the outer end, as in the familiar "Maltese Cross." But it does not follow from this that the English word "pated," with one t as Shakespeare wrote it (as in "grey-pated," "addle-pated," &c.), means anything but "headed."

(3) To prove that "russet" is not necessarily "red," although it has been applied by some to objects which may have a reddish tinge (as, for example, russet leaves in autumn), it will be instructive to examine a few illustrations of the use of this word by poets and prose writers of repute, in order to discover in what sense they have employed it.

Skinner, in his 'Etymologicon Linguae Anglicanae,' 1671, has "RUSSET, rāvus, a Fr. *rousset*, roux. It. *rossetto*, rutilus, rufus, hoc a rosse quod Italis rubrum signat tanquam sub-ruber."

It is natural, therefore, to connect the word "russet" with some subdued shade of red. But whatever may have been its original signification, it has by long custom come to be applied to shades of colour in which no trace of red is to be found; and this not with a few authors of a particular age, but with many poets and prose writers of different periods. From what follows it would appear that many probably derived their sense of the colour termed "russet" from the material which was formerly known as "russet" or "russetting," and which, as will presently be shown, was gray.

Bishop Mant, in the following lines, has employed the term "russet" as if it were synonymous with some pale shade of brown:—

"Before the scythe's wide-sweeping sway
The *russet* meadows tall array
Falls, and the bristly surface straws
With the *brown* swathe's successive rows."

Gisborne, in his 'Walks in a Forest,' employs the word russet to describe the colour of dead fern :—

"With faded leaves bestrewn and floating wings
Of russet fern o'ershadow'd whence upstarts
The woodcock."

Somerville, describing a Hare in her form, wrote :—

"Ah! there she lies! how close, she pants, she doubts
If now she lives; she trembles as she sits,
With horror seized! The wither'd grass that clings
Around her head of the same russet hue
Almost deceived my sight . . ."

The Chase, Bk. ii. 137—141.

The colour of a plain in autumn, imparted by an expanse of withered grass, is described by Somerville, in his 'Field Sports,' in the line—

"The Swallow skims the russet plain."

Pope also conceived that the word russet well described the colour of an open plain :—

"Here in full light the russet plains extend,
There wrapt in clouds the bluish hills ascend."

Windsor Forest.

Sir Walter Scott again, when describing the colour of a bare hill side, wrote :—

"Away hath pass'd the heather bell
That bloom'd so rich on Needpath Fell,
Sallow his brow and russet bare
Are now the sister heights of Yair."

Marmion, Intro., p. 4.

Elsewhere he writes :—

"And wither'd heath and rushes dry
Supplied a russet canopy."

Lady of the Lake, Canto I., p. 32.

At the present time, when naturalists are commemorating the centenary anniversary of his death, it is opportune to enquire what was Gilbert White's idea of the colour termed "russet." Fortunately for our present purpose, he has enlightened us on this point :—

"Romantic spot! from whence in prospect lies
Whate'er of landscape charms our feasting eyes,
The pointed spire, the hall, the pasture plain,
The russet fallow or the golden grain."

Invitation to Selborne.

Now it must be admitted that the colour of a fallow will vary in different localities, according to the nature of the soil that is upturned by the plough. In some parts of the country an admixture of yellow clay imparts a decided tinge of that colour; in the West of England the fallows are almost as red as a burnt brick. But in Hampshire and Sussex, where Gilbert White spent his life, the admixture of chalk in the soil makes the general aspect of the fallows grey or greyish white; certainly not red, or any shade of red.

Milton has expressly referred to gray fallows, while in the same line the term russet is used to describe the colour of withered grass upon a sheep-walk:—

“Streit mine eye hath caught new pleasures,
 Whilst the lantskip round it measures
Russet lawns and fallows *gray*,
 Where the nibbling flocks do stray.”

L'Allegro.

Gilbert White has also used the term “russet” in another of his poems to describe the colour of the grey smock-frock still, as in his day, commonly worn by the Hampshire shepherds:—

“Protective stalks the cur with bristling back,
 To guard the scanty scrip and *russet* frock.”

A Harvest Scene.

Dr. Johnson remarked that Sir Isaac Newton “seems to use this word (russet) for gray,” though I have not been able to find the particular passage referred to.

Turbervile, however, employs the word in the sense of mouse-gray when describing deer-horns in the velvet-stage:—

“His heade when it cometh first out hath a russet pyle upon it, the which is called velvet.”—*The Booke of Hunting*, 1575, p. 242.

Both Halliwell, in his ‘Dictionary of Archaic and Provincial Words, and Wright, in his ‘Dictionary of Obsolete and Provincial English,’ describe “russetting” as “cloth of a dingy brown colour,” and the former defines “gray russet” as coarse cloth of a dull gray colour. See also Forby, ii. 141.

The use of the word cloth implies that it was made of wool, but it appears rather to have been made of cotton. In the ‘Household Book of the Duke of Norfolk, 1481—1490,’ printed for the Roxburgh Club, is the entry (p. 320):—

"Item, the xxiiij daye of Novembre my lorde paied to Larken, to by him a gown of coton russet . . ."

Again, in the 'Privy Purse Expenses of Elizabeth of York,' queen of Henry VII., is the entry (p. 104):—

"March 1503. Itm. payed to Cristofe Ascue for v yerdes of cotton russet of him bought by Nicholas Sadler for the Quene's choare at vjd the yerd. ijs vjd."

And in the 'Household Book of Lord William Howard' (p. 291):—

"1633 Nov 9. For one yearde of russett Jean's fustian."

That the material known as "russet" and "russetting" was of a gray colour may be inferred from many illustrations of the use of the word.

Skelton, in his satire upon the Alewife of Leatherhead, Eleanor Rummynge, describes her as—

"Footed like a plane,
Legged like a crane,
In her furred flocket
And *gray russet* rocket,
Her hood of Lincoln green,
It had been hers I ween
More than forty year."

Thus Sir Walter Scott, in the ballad of 'Alice Brand':—

"If fall and vair no more I wear,
Nor thou the crimson sheen,
As warm we'll say is the *russet gray*
As gay the forest green."

Lady of the Lake, Canto iv., stz. 12.

This was the ordinary clothing material at one time amongst the English peasantry:—

"And for the better credit of the world,
In their fresh russets everyone doth go."

DRAYTON, *Eclogue ix.*

Shenstone, in one of his poems, written in 1714, in imitation of Spenser, has:—

“ A russet stole was o'er her shoulders thrown,
 A russet kirtle fenced the nipping air,
 'Twas simple russet, but it was her own.”

The Schoolmistress.

And Rogers has introduced it with good effect in one of his most charming poems:—

“ Mine be a cot beside the hill ;
 A bee-hive's hum shall soothe my ear ;
 A willowy brook that turns a mill
 With many a fall shall linger near.
 * * * * *
 Around my ivied porch shall spring
 Each fragrant flower that drinks the dew,
 And Lucy at her wheel shall sing
 In russet gown and apron blue.”

A Wish.

In 1653 our forefathers sang:—

“ Our clothing is good sheepskin,
 Gray russet for our wives ;
 'Tis warmth and not gay clothing
 That doth prolong our lives.”

Corydon's Song, in WALTON'S 'Angler.'

And here, as in the following quotation from Percy's 'Reliques,' it is evident that “russet” is the material, and “gray” the colour of it:—

“ Then Bessy that was of bewtye soe bright,
 All cladd in gray russett.”

The Beggar's Daughter of Bednall Green, I., 13, 14.

It was also employed as good wearing material for a soldier's doublet. Sir Walter Scott recognised this fact when he wrote:—

“ His skin was fair, his ringlets gold,
 His bosom, when he sighed,
 The russet doublet's rugged fold
 Could scarce repel its pride.”

Marmion, Canto I., p. 37.

Five-and-twenty years ago this same material, gray russet, or something very like it, was affected by sportsmen in the South of England when partridge-shooting in September. Struck with its

lightness and durability, I well remember about that time ordering, from a tailor at Chichester, a shooting coat of this material, which was only discarded when it became too small for the wearer. Modern tweed suits have since put this stuff out of fashion, but it must have found favour with sportsmen for many years, since it was in vogue in Byron's day :—

" The corn is cut, the manor full of game ;
The pointer ranges, and the sportsman beats
In russet jacket."

Don Juan, Canto xii.

But in regard to the sense of colour in which russet has been used, enough has here been adduced by way of illustration to show that, while it was sometimes used to denote some reddish shade of brown, as the colour of a hare, dead fern, heather, or withered grass, it was often employed to mean gray. Now as everyone knows, or should know, the colour on the pate of a Jackdaw in the breeding season is gray; not unlike that of a new smock-frock as worn by the labourers of Hampshire whom Gilbert White has pictured in their "russet-frock"; while the head of the red-legged Chough is wholly black.

Venerable gray-headed councillors might be not inaptly termed "chough-headed," and Thomas Nash, a contemporary of Shakespeare, in his 'Apologie of Pierce Pennilesse' (1592), actually has the expression "chuff-headed burghomasters."

When we consider, then, that the name "Chough," which is onomatopœic, was formerly applied to the Jackdaw; that Shakespeare has frequently written "pate" for "head," but never "patted" for "footed," and that he is by no means singular in his use of the word "russet" for "gray," there appears to be sufficient justification for concluding that his "russet-pated Chough" is not the red-legged Cornish bird, but our old friend the gray-headed Jackdaw.

ORNITHOLOGICAL NOTES FROM OXFORDSHIRE.

BY O. V. APLIN.

THE transcription of the following notes for 1891 has been delayed by a journey to South America, whence I have but lately returned.

JANUARY.

5th. A Redwing was caught in a garden at Bodicote, too weak to fly. Redwings and Blackbirds have finished the holly-berries there. A Little Grebe was found alive on the snow under the windows of a house in that village, a long way from any water; it was very thin.

6th. Examined a Coot, in very poor condition, which was shot the previous day on one of the open "scours" in the Cherwell, at Franklin's Knob, Bodicote.

7th. Heard from Mr. W. C. Darbey, of Oxford, that he had received for preservation the previous day a Pink-footed Goose from Wood Eaton (see Feb. 6th), also "Kingfishers innumerable."

8th. Sky Larks by this date had entirely left Bloxham parish; they are generally abundant, on one farm especially. Examined, at Mr. W. Wyatt's shop, a Grey Crow, shot close to Banbury this week, and a female Pied Woodpecker from Boddington, Northants, caught alive. The fields are now covered with two or three inches of frozen snow, the worst possible state for birds. News from Mr. M. F. Melliar that he saw a Barred Woodpecker at North Aston on the 6th.

10th. A little flock of Ring Doves haunting a swede field at Bloxham. Found one Snipe in the warm ditch at Barford, which remained open through the frost, though the rapid Swere, close to it, was frozen. Intensely sharp frost; tracks of bird and beast most beautifully impressed on a sprinkling of dry powdery snow recently fallen on the crust. Saw about twenty Carrion Crows roosting in some trees near Barford; a few remained with us all the winter, and some generally frequent this roosting-place, but I never saw so many there before, and think they must have been migrants. Saw a Kestrel.

12th. Mr. Darbey wrote on the 11th:—"The poor Kingfishers seem now to be all killed, for I have not had one in for

several days, and I hear from people who frequent the water side that now they do not see one where a few weeks ago dozens could be seen." He had then nine Herons in his shop; Mr. Wyatt received two or three about the same time.

15th. Examined an adult Razorbill which had been shot at Wroxton the day before, a long way inland.

17th. One Snipe in the warm ditch. A "charm" of half-a-dozen Goldfinches feeding on seeds of the alder at Bloxham.

18th. Heard to my surprise this afternoon the spring note of the Great Titmouse. The temperature did not rise above freezing point the whole day, and when we looked at a thermometer one yard from the ground in a sheltered place, shortly afterwards, the mercury stood at 28°.

19th. News from Mr. Darbey that he had received a Whooper, which was shot about the 10th inst (see Feb. 6th).

21st. A male Barred Woodpecker was brought to me from Banbury.

23rd. A Robin sang for the first time since the frost began at the end of November. News from Mr. M. F. Melliar that he saw the day before on the flood at Bertmoor, North Aston, fifteen Wild Swans.

24th. News from Mr. W. W. Fowler that he had observed a few Bramblings with Chaffinches in rick-yards near Oxford.

26th. Sky Lark singing; a few seem to have returned within the last few days.

30th. Bright, sunny, and very warm. I went to see the Wild Swans in the Cherwell Valley near North Aston, and found five in the large low-lying meadow known as Clifton Big Meadow; they were standing in shallow flood, feeding at intervals. Taking a considerable detour, we approached them along a bank of higher ground between the river and the flood, and got within 150 yards before they rose. As we had taken care to approach down wind, with the sun at our backs, the Swans had to come towards us on rising, and passed us in single file at about eighty yards distance or less, and only just topped the willows as they crossed the Cherwell, uttering their loud trumpet-like calls; they pitched on Bestmoor in deep water, where we left them when it was growing dark, their great white forms showing up on the water against the sunset glow. We saw a good many Mallards and Ducks, and heard at night the call of Teal and the "whew, whew" of one or two

Wigeon. Mr. A. H. Cocks records (Zool. 1891, p. 153) that two Snews (adult and young males), out of a bunch of four, were shot at Sunning, Oxon, about the middle of January, 1891.

31st. Mr. F. C. Aplin saw three Gulls flying over Bodicote in an easterly direction; wind about W.N.W.

FEBRUARY.

6th. Examined the following birds at Mr. Darbey's:— A Whooper, shot on the Upper Thames at Lechlade, Gloucestershire, on or about Jan. 10th, 1891, weighed 28 lbs. (see Jan. 19th). Pink-footed Goose, Water Eaton, adult; a tiny white patch at base of beak; bill very bright-coloured (see Jan. 7th), and a Sparrowhawk, a small and peculiarly warm-coloured female. Mr. Darbey said he had received many Bramblings during the winter of 1890-91. Mr. J. Baldwin Young, of Trinity College, told me of a Wild Swan (probably a Whooper) seen before the ice broke up, on the river about Ifly by a friend of his who knows these birds well from seeing them in Scotland. Observed in Christ Church meadow a flock of a score of Redpolls in some large alders. Mr. Fowler told me of a Barred Woodpecker he saw in the Broad Walk just before the very severe weather.

7th. Heard Chaffinches singing at Parson's Pleasure, but Mr. Fowler had heard them for some days previously. At Cornwell in the afternoon we saw one Coot on the ponds, and counted thirty or forty Moorhens.

10th. A Kittiwake was shot on the 3rd in Swalcliff Park, as reported in the 'Banbury Guardian.'

15th. Two Chaffinches in song here (Bloxham); in a long walk from Clattercote Reservoir yesterday Mr. J. B. Young and I did not hear one, and neither of us remembered seeing one; the scarcity of this bird since the frost has been remarkable. Obtained information about a large bird which came down stream, dead, and was found against the wheel-grating at North Aston Mill; it was seen on the 9th hanging on the mill-wall by a friend of mine, but was gone to-day. From description given, and a sketch of it made by the owner (who is a collector of birds in a small way), however, I have no doubt at all but that it was an adult Red-throated Diver in winter dress. Saw a Grey Wagtail in the pool below the mill; these birds (which were here in small numbers in the autumn of 1890) entirely disappeared during the severe frost.

On one of the lines of posts and rails crossing Bestmoor I saw a large hawk; it was a long way off and I had no glass, but the afternoon was very clear, and I could see the bird well: it seemed to be all grey (a companion who is not an ornithologist, but is a sportsman; independently remarked upon this), and I have no doubt it was a male Hen Harrier. Walking home along the canal, in the dusk, we saw a Short-eared Owl beating along the bank. Examined an adult Sheldrake, shot at North Aston Mill in the winter of 1889-90, and an adult Common Tern, shot at the same place in the *late* autumn (October or November, 1889).

16th. Some Chaffinches have apparently returned; several in song this morning, but hardly full yet.

17th. At a sale at Adderbury House I purchased an adult male Golden Oriole set up in a small old-fashioned box-case. I fancy it is the work of a birdstuffer named Goodway, formerly of Banbury, but now dead. As far as I can discover, no one now living can give the history of this bird, but I have little doubt that it was killed upon the estate. The only other stuffed birds in the house were a Kingfisher (in a similar small box-case, by the same hand), and some Partridges and Pheasants, all evidently set up many years ago.

22nd. A Grey Wagtail in the village brook for the first time since the frost.

MARCH.

2nd. My sister-in-law (who is acquainted with the appearance of the bird from two stuffed specimens in the house) saw two Great Grey Shrikes in a tall hedge at Bodicote. The observer, who described them as of a pearl-grey, with black on the wings, and a fan-shaped tail in flight, was first attracted by the small birds, which were mobbing the Shrikes. As soon as the first Shrike took flight and uttered a curious note, the small birds were silenced and made off.

6th. A few Peewits appeared on the arable lands where they breed.

11th. Examined a male Hawfinch, with the blue beak of summer, which flew against a window on the outskirts of Banbury, and was picked up stunned; it had remained stunned for an hour and looked rather "dazed" when I saw it; but I heard some time afterwards that it was alive and perfectly well.

12th. Mr. Wyatt had a male Brambling in the flesh, and, a

few days previously, a nice female Pied Woodpecker, both procured close to Banbury.

17th. An adult Kittiwake was killed near Banbury to-day; another was found dead in the Cherwell at Oxford on the same day, by Mr. F. W. Lambert ('Oxford Times'). Severe weather lately.

28th. A Grey Wagtail in the brook at Bloxham.

APRIL.

4th. A little flock of Meadow Pipits on some rough ground on the banks of the Swere at Barford; I saw two or three on an old cart-road called the Ridgeways here on the 29th March.

5th. Notwithstanding the wintry, snowy weather lasting up to the 2nd of this month, I found a Peewit's nest containing four eggs here, and from the action of the birds the eggs were probably incubated. This nest, which was in a very rough and rather foul piece of young wheat, was much more substantial than these nests generally are (perhaps on account of the inclement weather); it was a cup of squitch-grass, and roots, with walls nearly half-an-inch thick, standing up well above the ground.

7th. Saw a party of seven or eight Redpolls.

11th. Heard a Tree Sparrow singing. I never heard one before; it was a chant rather than a song—merely a string of more or less harsh notes in no particular order, and jerked out in a disjointed way. The notes were "chit wit weet weet chit wit chur." I heard the Tree Creeper singing on the 28th February and the 12th April.

14th. A friend living at Milcombe told me that five years ago they began to kill the Magpies by shooting them in the hedges at night, and since then they have killed on an average fifty every winter. In 1889-90 they got sixty-five. In the past winter only twenty were killed, as the snow on the ground made it difficult to approach the birds. Notwithstanding this he noticed four nests in sight at once a day or two ago. I recently counted five nests in sight at once on the Barford side of Bloxham.

18th. Young Rooks were calling from the nests.

26th. Heard in the lower part of Milcombe Gorse the note of a bird which I did not know—"chit-e-chee, chit-e-chee"—and traced it to a slender dark-coloured bird sitting in the top of a thorn rising out of thick gorse. It was a Dartford Warbler,

a bird I have looked for for years in this district, and always expected to find on Todmarton Heath, which almost joins this gorse; but the latter is much warmer and more sheltered. I watched it for a few minutes, when it became alarmed and dropped like a stone into the gorse. The note I heard was no doubt that which is syllabled by Mr. Howard Saunders "pit-i-chou." My lettering, of course, merely records my impression of the note, and was pencilled down after hearing it repeated only some half-a-dozen times or so. The Grasshopper Warbler was singing in the gorse on my return at 7.30 p.m. I saw a male White Wagtail in the village brook.

27th. On the east of Bloxham village are rather high-lying arable fields, very open and divided by low hedges, with hardly any trees. This afternoon I was crossing a part of the largest of these which had been planted with barley. The barley had sprouted about an inch high; here I caught sight of a small flock of birds wheeling round low over the ground. They alighted again almost directly, and by walking round and round in an unconcerned manner I got within fifteen or twenty yards of them before they rose again. They were Dotterel, a bird I had never seen alive before. The "trip" comprised eighteen birds. Of these two were plain and very light-coloured; six were darker, but still quite dull, with no bright colours; the other ten were in full plumage, five or six of them being most brilliant birds. (See 'The Field,' 7th May, 1892.)

28th. The Tree Creeper is very common this spring. I have seen more individuals than in the last year or two altogether. Mr. F. C. Aplin saw one a few days ago busily searching the walls of an old brown stone house in Rodway, Warwickshire. I never happen to have heard of a Tree Creeper on a house-wall before, and it seems the more curious because there is an abundance of old timber about Rodway.

MAY.

3rd. News from Mr. Fowler at Oxford that he saw on April 29th, in Port Meadow, among a company of *Motacilla raii*, one which he "had little doubt was *M. flava*: dark head, and back darker than *M. raii*, and altogether different from the rest, including females." He could not get a long-enough or near-enough look to discover the white eye-stripe, as the river was crowded

with boats. The Blue-headed Wagtail is new to the Oxon list. As mentioned further on, I saw another in the same place on the 2nd Sept. following. Mr. Fowler also reports a male Pied Flycatcher catching flies from the iron rails by the Cherwell at the bottom of the Parks. Mr. Lambert reports, in the 'Oxford Times,' that he saw three Dunlins on Port Meadow on the 14th April.

5th. Visited Clattercote Reservoir, but found it very low and inhabited only by one pair of Crested Grebes, two pairs of Coots, and one Mallard. Went on to Wormleighton (Warwickshire), where I saw one pair of Grebes, three pairs of Coots (one nest contained six eggs), some Moorhens, and a pair of Teal. These last were flushed from a thick belt of bushes, brambles, willows, and rushes between a thick hedge and bank and the water. The cover was so thick that it is hardly to be wondered at that a search for the nest was unsuccessful; but I have no doubt that they were breeding; the spot was a most likely one, and the birds would not leave the water, pitching down again several times after a flight. Mr. Reeve told me that in Tor Wood, South Leigh, on the 2nd, he noticed two Nightingales singing, heard the Grasshopper Warbler, and saw a Nightjar.

7th. Saw at Mr. Wyatt's a male Hawfinch which flew in at a room window at Neithrop, Banbury, a few days before.

8th. News from Mr. Fowler, at Oxford, that he found a Wood Wren singing at Parson's Pleasure the day before, and also observed the Nightingale and Lesser Redpoll there.

15th. When Rook shooting at Bloxham Grove I saw a Hobby, which darted out of a spinney behind me and came over my head. It got up rather high in the air, and went down to the valley, being attacked twice on the way by a Rook, but the hawk with a turn of its wings just mounted above it, and took no more notice. Had news of the following birds from Mr. Lambert:—The Wryneck was heard at Godstow on 23rd April, on Open Brazenose on 1st May, and at Godstow on 7th May. He remarks that he never found the eggs of this bird, and that it is uncommon about Oxford. A Green Sandpiper seen by him on Port Meadow on the 25th April. Several Grasshopper Warblers observed on Open Brazenose on May 1st. A Hobby shot at Church Handborough on the 4th May. Two Wood Wrens seen at Wood Eaton on the 10th May. Two males and a female Red-backed Shrike observed at

Godstow and Binsey on the 12th May, and Lesser Redpolls were seen in Port Meadow as late as the 15th April.

17th. News from Mr. Arthur H. Macpherson that on visiting Oxford he had examined, at Mr. Darbey's, a male Pied Flycatcher, which was rescued by a gardener of St. John's College from a cat on the 25th April.

18th. The snow which fell all last night lay three or four inches deep early this morning. A very hard frost this night.

21st. Heard the song of the Grasshopper Warbler between Bloxham and Barford.

27th. Thirteenth consecutive day with rain, or snow, and cold winds.

28th. A Chiffchaff's nest with seven eggs, in Mr. F. C. Aplin's garden at Bodicote, was built on an ivy-topped wall; the nest was about two feet from the ground, on the bare stems of the ivy and a foundation of rubbish lodged there.

JUNE.

7th. When at Kingham with Mr. Fowler, we found nest of Grasshopper Warbler on outskirts of Oddington Ashes, just over the Gloucestershire boundary, containing three young birds and two addled eggs. We also heard a Nightingale near Churchill Heath Wood, and another in the wood, and saw a pair of Wood Wrens. Have had news of adult Night Heron shot on the Windrush at Burford on the 27th May; also of a Red-backed Shrike seen near Filkins, in that neighbourhood on May 22nd.

JULY.

6th. Heard the song of the Grasshopper Warbler close to a young plantation on the edge of the heath at Epwell.

11th. Examined a colony of Sand Martins in a pit of peculiarly fine white sand at a hill near Todmarton (a limestone hill capped with sand), and counted about 180 burrows, although the pit is only about twenty yards long by twelve wide and ten to fifteen deep. Saw two Kingfishers at the Fulling Mill, the first I have since the frost. News of a Curlew seen flying over low down near Bloxham on the 7th.

19th. The scarcity of Swallows and Martins, consequent on the severe weather in May, is now apparent.

30th. The 'Banbury Guardian' of this date contains an

announcement by Miss Dorothea J. G. Prater, of Farnborough, to the effect that she saw on the 25th a beautiful pair of Golden Orioles. The cock bird alighted on some railings close to the high road between Little and Great Bourton, then flew slowly over a cornfield, followed by his mate. From enquiries made for me by the Rev. H. Holbech, I am satisfied, by the description given, of the correctness of Miss Prater's identification, and that the birds were really Golden Orioles.

31st. Observed a pair of Red-backed Shrikes with young on the wing, near Banbury, close to the favourite haunt of this species, the brickyard on the Broughton road.

AUGUST.

8th. Observed about a dozen (migratory) Wheatears in a meadow at Barford. Swifts remained with us until a remarkably late date this year. Usually they depart by the middle of August, and although stray birds have been seen in the first half of September in some years, I have no note of any other season in which they were observed continuously up to so late a date as they were in 1891. For convenience, I have brought together my own observations of Swifts after their usual time this autumn:—Aug. 18th, Swifts round the church tower; 20th, Swifts in Banbury; 24th, a pair round the church; 26th, one; 27th, one between Bloxham and Banbury, and at least twelve circling round the church tower there; I also saw one go in under the eaves of a house. From this date to Sept. 2nd I was out of the county, but saw Swifts almost daily in Berkshire and Hampshire. Sept. 2nd, several, some screaming, at Oxford; 4th, four or five here. The weather at the end of August was cold, wet, and stormy.

SEPTEMBER.

2nd. Observed on the tow-path just above Oxford a Blue-headed Wagtail. It was over the moult, but its head had a decidedly grey tinge, as contrasted with the back, and was also darker; white eye-streak conspicuous. A rather strong wind was blowing, and I watched the bird for five minutes as it ran along the path (sometimes within three yards of me), catching flies and picking up insects in the shelter afforded by the hedge-bank and the long grass and plants on each side the path. It is noticeable that Mr. Fowler saw one near this place in the previous

May (*ut sup.*). Mr. Darbey told me he had received a Ring Plover from Port Meadow the day before, and that he usually receives one, or hears of one being seen, about this season. He had also had some Terns from the river, as usual. The Botanic Garden was very gay with autumnal flowers in the sunny afternoon, and full of birds. Willow Wrens and Robins in song, Chiffchaffs also (but song very faint), Flycatchers, Blackbirds, Thrushes, Starlings, Pied Wagtails, Chaffinches, &c.

5th. Wheatears sitting on a wire fence at Barford, side by side with Flycatchers.

6th. A Bodicote boy caught a young Cuckoo and brought it to Mr. F. C. Aplin; this is a late date.

7th. Observed at Bodicote what I have little doubt was a Ring Ouzel, but I could not get near it on account of its shyness. It flew from tree-top to tree-top, settling finally on a bare branch, where it remained jerking its wings; it looked long when flying.

25th. Flushed a Landrail from cut barley; this bird is not nearly so often seen after as before the middle of the month.

27th. Two Kestrels hawking about a grassy hill-side, about 6.30 or 6.45 p.m. (clear evening, sunset at 5.47). They often settled on the ground, and were doubtless taking the Dor-beetles which were about.

OCTOBER.

2nd. Examined a Shag, *Phalacrocorax cristatus*, shot the day before on the Cherwell, at North Arton Mill.

11th. A good many Swallows and Martins observed.

14th. A few of both. Destructive storm from S.S.E. and S.W., yesterday and to-day.

16th. A fairly large party of Swallows and Martins, chiefly the latter.

17th. Observed a charm of Goldfinches; between thirty and forty in number, two or three still wanting the red colour on the face. A good many Martins still lingering about.

18th. Information of two or three Gulls seen flying over in a south-westerly direction a few days ago.

21st. Purchased a Fork-tailed Petrel which was picked up under the telegraph-wires at Banbury the day before. A great visitation of these birds to the coasts of Ireland and the West of England recently. Three or four Martins.

24th. Observed a Lesser Redpoll at Wigginton.

26th. News of a Fieldfare seen yesterday, and of a Curlew heard flying over.

27th. Saw a small flock of Fieldfares.

31st. Observed in the valley just above Somerton a very large congregation of Lapwings—from two to three thousand I calculated. The great flat open meadows were covered with birds. Four or five Herons were sitting on the ground or walking about; also Crows, Starlings, Fieldfares, and Meadow Pipits. Also observed two Wigeon; and near Nell Bridge eight Wild Ducks and a bunch of fourteen Teal. Put up some Snipe, very wild, twelve of which gathered into a wisp and flew round for some time.

NOVEMBER.

1st. A friend told me he had shot a Grey Crow, at Wickham Mill, on the 30th ult. Also that he heard the note of a Quail, "*Twit-me-dick*," there this spring; and had lately heard waders calling as they flew over at night. He hears them occasionally in spring and autumn. In or about 1885 a Quail's nest was found at Wickham.

3rd. Examined a Brent Goose in the flesh, which was shot by the Cherwell, close to Banbury, the day before. Breast and belly lead-grey, clearly defined from the black of the upper breast.

7th. Observed a Pied Woodpecker in a line of oaks between here and Barford. The '*Oxford Times*' contains a notice of Golden Plover and Tern, shot on Port Meadow on the 26th and 27th ult.

13th. Examined a Common Buzzard at Mr. Coombs' shop, in Chipping Norton, which was shot on Oct. 16th at Cornwell. Also a Short-eared Owl, in the flesh, from Chadlington. They are found on the stubbles at this season.

16th. Heard the unmistakable whistle of a Grey Plover as it flew high overhead between here and Banbury; the weather was very thick, grey, and cloudy, and I could not see the bird.

21st. Saw an old Swallow at the end of Broad Street, Oxford. Examined at Mr. Darbey's shop the following birds, of which I had heard previously:—Peregrine Falcon, adult male, caught at Islip in the top of a falling tree in one of the gales in the middle of October; Peregrine Falcon, young male, shot at Stanton Harcourt while in pursuit of a Pigeon, about the second week in November; Manx Shearwater, adult, found at Hazely in the first

few days of September; Slavonian Grebe, adult in winter dress, but showing traces of the horus, shot at Sandford a few days before I saw it; Little Owl, trapped in a rabbit-hole in a bank, near Thame, and sent to Mr. Darbey on Nov. 11th (this species is new to the county list); four Grey Phalaropes, apparently adults changing into winter dress, procured in the middle of October—one on Port Meadow, one at Handborough, the others close to Oxford; another, obtained on the Gloucestershire side of the county in the latter part of October, was taken to Mr. Coombs; and on the 7th of December Mr. Warde Fowler bought one in Oxford Market, making the sixth example which had come inland to Oxfordshire from the hosts of these birds which come to our southern and south-western shores during S.W. gales in the middle of October. This year saw the greatest immigration to Great Britain of Grey Phalaropes which has occurred since the notable invasion of 1866. Stock Doves are numerous and very tame in Oxford now.

23rd. Mr. Fowler and I saw either a Swallow or a Martin (probably the former) for a moment over Lincoln College Quadrangle. Both species have been observed almost continuously in Oxford up to this date. There were many Swallows, Mr. Fowler tells me, over Merton Meadow on the 12th. On reaching home, a supposed hybrid between a Blackbird and Thrush was brought to me (Zool., 1892, p. 145). The cold wet summer, and fairly wild, very wet autumn, probably accounts for the late stay Swallows and Martins made. But Gilbert White long ago observed that they habitually remained late at Oxford. The last Swallows I saw here (at Bloxham) were on the 16th October, and the last Martins (three or four) on the 21st.

26th. A Short-eared Owl was brought to Mr. Wyatt.

DECEMBER.

8th. At Clattercote Reservoir I saw a fine drake and duck Wigeon (the only ducks there),; and two Great Crested Grebes in full winter dress, though I think they were both young birds of the year, and one certainly was so. I never saw Crested Grebes on this water later than Nov. 18th in previous years.

19th. The ice on the floods would bear skaters, and the season was changed from this time. To show the absence of frost up to this date the following observations may be worth preserving:—Oct. 23rd. Scarlet runner beans still fit to eat;

plums still hanging on trees; apricots were still on the trees in the first half of the month. Dec. 3rd. In a garden at Bloxham were two strawberries nearly ripe, peas in full bloom, and raspberries in full leaf. Dec. 4. Two Bats on the wing in Banbury at 2 p.m. Dec. 5th. On this and previous morning a Chaffinch sang three or four notes of its song—most unusual. Dec. 16th. A small bunch of violets were gathered in the garden and two roses from the wall.

20th. Great flock of Larks on a clover lea.

28th. Purchased a Great Grey Shrike, shot near the Cemetery at Banbury on the 23rd (Zool. 1892, p. 112); also examined a female Pied Woodpecker and a male Barred Woodpecker, shot near Hanwell and Banbury respectively.

There were great floods in October, November, and December. The rainfall in December was 4.14, and 28.66 for the year.

NOTES AND QUERIES.

Transportation of Coral by the Gulf Stream.—On the 25th of July last, I was shown by Dr. Kissmeyer, the resident Danish physician, at Westmanshavn, Stromoe, Faroe Islands, a very remarkable example of sea-drift; namely, a large mass of Brain Coral, weighing about seventeen pounds, which was found attached to a beam of wood that floated into Westmanshavn harbour during the month of March, 1891. I consider the coral to be *Diploria cerebriformis* (Lam.), a well-known species of the tropical Atlantic, and abundant in the Carribean Sea. An interesting feature of the occurrence lies in the fact that the beam of wood must have remained sufficiently long in tropical waters for the coral polypes to rear their calcareous structure on it, for the under part of the mass shows plainly the surface of attachment or adherence to the wood. How this large mass resisted the tossing and fretting of the ocean during its long voyage across the Atlantic is wonderful; but a more striking reflection is, that if the beam of wood had not come ashore on the Faroe Islands it might possibly have been floated on to the shores of Spitsbergen, and there sinking have become entombed in the glacial deposits which are now forming in the bays and fiords of the lands within the Polar area. Owing to the rapidity of elevation which all the land areas around the Pole appear to be undergoing, and which I have so frequently referred to in this Magazine, the observer of a few generations hence might have

found this mass of coral lying side by side with the boreal fauna of the Polar area.—H. W. FEILDEN (West House, Wells, Norfolk).

MAMMALIA.

The Vole Plague in Scotland.—The daily papers announce that the doubts expressed by the Vole Commission as to the efficacy of Professor Löffler's *bacillus typhi murium* in destroying the vole plague in Thessaly are, in part at least, confirmed by the experiments of Dr. Lüpke. This bacteriologist finds that it is potent only where weakly voles are concerned. The robust ones not only resisted its action, but were actually rendered immune by the inoculation they had undergone. A new specific has, however, been brought out by Herr Laser, of Königsberg, which, he affirms, is much more potent than the Löffler bacillus, and is, moreover, said to be quite innocuous to horses, guinea-pigs, pigeons, cats, and other domestic animals. We are enabled to add upon the best authority that in Scotland the voles have now almost entirely disappeared from the affected area, and that notwithstanding the fears of the farmers in certain districts that their pastures were ruined, there has not been such a crop of grass for years. So good, indeed, are the pastures, that large drafts of lambs have been for some time sent direct off the hill to the fat market, a most unusual event on such high farms. Doubtless the excellence of the pastures may be attributed by some to the favourable season; but it is a remarkable fact that the areas which were most affected by the voles have the best crops of grass, and the lambs are in better condition and are fetching higher prices than those from any other district.

Swimming Cats.—Apropos of Mr. Southwell's communication (p. 302), I may state that I have at various times had three cats at my fish-farm that have been not only good swimmers, but also good fishers. Everyone knows that cats are fond of fish, but it is generally supposed that they will not enter the water to catch them. I believe any cat brought up amongst fish-ponds, where fish are in the first instance occasionally easy to capture, will soon cease to be afraid of the water. I have seen a cat sit on the cover of a raceway where the water entered, and regularly take trout-fry with her paw. The act was performed with the greatest ease, the animal always securing a fish. I have seen the same cat sit crouching on the bank of a pond, and when a trout rose within a yard of her spring upon the fish. I never saw her succeed in catching one, but she would swim quietly across the pond and walk out at the other side. Another cat I had several times succeeded in catching trout of 1 lb. or so in the raceways. The common Brown Rat, *Mus decumanus*, also takes fish whenever he can get them, though I believe he is not often suspected.—J. J. ARMISTEAD (Solway Fishery, Dumfries).

Marten in Lincolnshire.—I saw about a fortnight ago, in the Angel Inn at Peterborough, a stuffed specimen of the Marten, which, as I was informed by the proprietor, was trapped four or five years ago near Sleaford. You may, perhaps, think this worth a note in 'The Zoologist.'—G. E. H. BARRETT-HAMILTON (Kilmanock, New Ross).

Food of the Squirrel.—Seeing Mr. Cordeaux's note (p. 301) respecting Squirrels taking fruit, I may remark that I have several times known them to take plums from my orchard. Close alongside I have a plantation of larch and Scotch firs in which Squirrels are common, and where they are unmolested, for I have given orders that none are to be killed. Practically I do not find them do much harm, and the few plums they occasionally take are hardly worth consideration. It is also quite easy, if desired, to frighten them away by lying in wait, or stalking them with a garden-syringe and some paraffin or tar-water.—J. J. ARMISTEAD (Solway Fishery, Dumfries).

Mice and Apricots.—Apropos of Mr. Cordeaux's note on Squirrels eating apricots, it may interest him and others to learn that in Nottinghamshire apricots have been attacked by mice. When visiting Bramcote Hall lately, a lady told me she had observed a mouse running down the branch of an apricot-tree to the earth. Wondering what the little creature could be doing, she examined the fruit, and found that many apricots had been nibbled. I suggested that probably the mice wanted to get at the kernel, but was informed that only the pulp of the fruit had been attacked. Some species of mouse (I believe the Short-tailed Field Vole) every year clears off the crop of filberts growing on an island in the Soar which is tenanted for sporting purposes by a relation. To gain access to the trees the mice must swim a deep arm of the river fully twenty yards across. So numerous were they a year or two ago, that a pair of Weasels reared their young on the island, probably preying entirely on the mice. The island and the surrounding meadows are liable to extensive floods.—F. B. WHITLOCK (Beeston, Notts).

[It would be of interest to ascertain for certain, by trapping, this species of mouse, or vole, referred to. So far as our experience goes, it is not the habit of *Arvicola agrestis* to climb, or to eat the kernels of nuts. We have never found anything but green food in the stomach of this species, but have several times found in the stomach of the Bank Vole a white mass resembling comminuted kernels of hazel-nut or acorn. If the Bank Vole is not to be found in the locality indicated, perhaps the culprit is the Long-tailed Field Mouse, *Mus sylvaticus*, which is not only an eater of kernels, but a good swimmer. But may not a good number of filberts be carried off by birds?—ED.]

Daubenton's Bat in Bedfordshire.—Whilst returning from a day's shooting on the River Ouse on August 9th, we neared a quiet part of the

stream at Cardington Mill; the water, sheltered by the mill in front of a plantation by the side, gave it a very secluded appearance. Bats skimming round and about our boat attracted my attention, and from their numbers I was able to keep them well under observation. Their slower flight, constantly near the surface of the water, reminded me of the habits of Daubenton's Bat, and upon shooting two of them, they proved to belong to this species.—J. S. ELLIOTT (Dixon's Green, Dudley).

BIRDS.

Preservation of the Kite in Wales.—In reply to Mr. J. H. Salter (p. 311), let me assure him that a great deal has been done during the past twenty years towards the preservation of this fine bird in at least one county in Wales, thanks to the care taken of them by several large land-owners. I do not give the name of the county, because I do not want a visit from the "gentleman egg-collector," who has already given me a great deal of trouble, and to whom it appears nothing deserving of protection is sacred.—E. CAMBRIDGE PHILLIPS (Brecon).

Golden Oriole in the Færoe Islands.—The veteran ornithologist of the Færoes, Herr H. C. Müller, informs me that a specimen of *Oriolus galbula* was shot near Wellestad, Island of Stromoe, during the latter part of May, 1893. This is the first example that has come to the notice of Herr Müller, or been recorded from Færoe.—H. W. FEILDEN.

Avocet in Nottinghamshire.—An immature male of this rare bird was picked up, on July 9th, on the mud-bank of the river Trent below Newark, with wing and leg injured as if from a shot. It is the first specimen I have met with in fifty years' collecting.—A. C. ELLIOTT (Newark-upon-Trent).

[A bird whose habits lead it to prefer marshes and muddy shores is not likely to be often met with in a county like Nottingham. Nevertheless Messrs. Sterland and Whitaker, in their list of county birds, mention four instances of its occurrence between the years 1800 and 1856.—ED.]

BATRACHIA.

Rana agilis in the Channel Islands.—Among some reptiles which I have been naming for Mr. Linnæus Greening, of the Warrington Museum, I found a specimen of *Rana agilis*, labelled "Jersey." Mr. Greening informs me that he received several live specimens of this frog, in 1888, from Mr. E. Spencer, who obtained them about a mile from St. Peter's, Jersey. I have found it common, though local, on the north coast of Brittany; there is therefore nothing very surprising in its occurrence in Jersey, which is nevertheless, at present, the northernmost point whence it is recorded in Western Europe. The specimen mentioned has been presented by Mr. L. Greening to the British Museum.—G. A. BOULENGER.

MOLLUSCA.

The Method of feeding in *Testacella*.—Owing to the fact that the proofs of my paper in 'The Zoologist' for August, when received by me, were paged, I was unable to give to two fellow-countrymen the credit due to their observations on *Testacella*. Thomas Blair (Mag. Nat. Hist. vol. vi. 1833, p. 43) found by experiment that the worm was usually seized by the end, but records a case where one was caught by the middle, observing at the same time that the difficulties he saw in the way of its being swallowed were not overcome in this instance. Some further remarks are made by a writer signing himself "J. D." (query, John Dovaston), and again, in the following year, the latter writer, in describing the habits of some of the slugs sent to him by Mr. Blair (Mag. Nat. Hist. vol. vii. 1834, p. 224), mentions that a specimen protruded a white organ against his hand when holding it. I ought also to take this opportunity of calling attention to a paper by Mr. W. E. Collinge, dealing with the generative system in the genus *Testacella* (Annals & Mag. Nat. Hist. vol. xii. July, 1893, p. 21), which bears out my remarks on the specific distinctness of *T. scutellum*.—WILFRED MARK WEBB (Holmesdale, Brentwood).

 NOTICES OF NEW BOOKS.

Fur-bearing Animals in Nature and Commerce. By HENRY POLAND, F.Z.S. 8vo, pp. i—lxv; 1—392. London: Gurney and Jackson.

LONDON is the great market for furs and skins of the world, and not St. Petersburg or Nijni-Novgorod, or any of the great cities of Northern or Western Europe or Canada, as many imagine; and to our metropolis come the fur-merchants of every part of Europe, Asia, and America.

Mr. Poland, as a leading London furrier, may be assumed to have the statistics of the trade at his fingers' ends, and, so far as concerns an enumeration of the various species of animals whose skins have a commercial value, the numbers annually imported, and their comparative prices, he may be deemed to write authoritatively; but when, in addition to these statistics, he attempts to give some information on the natural history of these animals, he very soon gets out of his depth, and shows that an author may be a "Fellow of the Zoological Society" and yet know very little about Zoology. It is clear, from his remarks,

that he knows nothing from personal observation of the habits of the animals he writes about, nor has he sufficient acquaintance with the literature of his subject to enable him to quote the most reliable authorities. This is to be regretted; for the subject is a good one, and if properly treated might have resulted in the production of a very useful book. As it is, its utility is confined to that portion of it which deals with what may be termed trade statistics, while the natural history portion of it must be regarded as not only inaccurate in details, but incomplete when compared with the abundant materials which—though unknown to the author—are available for such a compilation.

Not many years ago Dr. Elliott Coues published a volume entitled "Fur-bearing Animals," in which he gave an excellent account of the Wolverine, the Martens or Sables, the Ermine, the Mink and various other kinds of Weasels indigenous to North America, besides several species of Skunks, the Badger, the land and sea Otters, and numerous exotic allies of these animals; yet we do not find this authoritative work anywhere quoted by Mr. Poland. Nor does he appear to be acquainted with Caton's 'Antelope and Deer of America' (a second edition of which appeared in 1881), or with Allen's splendid monograph on the "American Bisons, Living and Extinct," with 12 plates and a Map, published in the 'Memoirs of the Museum of Comparative Zoology at Harvard College.' These, and other volumes we could name, would at all events have furnished Mr. Poland with reliable information on the American species noticed in his book. In regard to the Bison, now on the verge of extinction, it was to be expected that he would have referred to the latest published statistics concerning its present limited distribution; but this unfortunately he has not done.

We shall not attempt to correct all the mistakes we have noted, but reference should be made to a few at least, in order to justify our criticism.

"The Wild Cat," says Mr. Poland (p. 35), "is indigenous to Great Britain; it is by no means rare in Sutherlandshire, Ross-shire, Inverness-shire, parts of Perthshire, and South Caithness." So far so good, though he might have added Argyllshire; but he goes on to state, "It is also found in North Wales, and some of the northern counties of England," adding that "it is very rare in Lincolnshire." The authority for this information is not

given, and, as most readers of 'The Zoologist' will know, it would be very difficult to find.

"The Manx Cat," we are told (p. 42), is tailless, and resembles the Lynx in this respect;" but Mr. Poland surely cannot suppose that Lynxes have no tails, though they are certainly shorter than those of the typical *Felidæ*.

The statement that the Beech Marten, which he calls *Mustela foina*, "is found in Scotland, Ireland, perhaps in North Wales, and is probably extinct in England," shows that, for Mr. Poland, English zoologists for the last ten or a dozen years have written in vain, otherwise he would be aware of the general acceptance of the late Mr. Alston's view (Proc. Zool. Soc. 1879, p. 468), that this species of Marten has nowhere been met with in the British Islands.*

The statement (p. 273) that "the Hare chews the cud, and like other Rodents is able to raise itself on its hind legs," betokens some confusion of ideas about Rodents and Ruminants; and the remark (p. 274) that "the Brown Hare has been known to cross with the Blue, or Varying, Hare of Scotland," would have been valuable had it been followed by some evidence in support of the statement. We wonder what sportsmen will think of the remark that "its habit of crouching at times on the ground is the reason of its being coursed with two Greyhounds." The account given of sport with the Rabbit (p. 280) is equally amusing and misleading.

The old story of the dark-coloured variety of the Fallow-deer having been introduced by James I. from Norway, is once more repeated, in spite of its having been shown years ago to be altogether fallacious.† So difficult is it to eradicate a popular fallacy when once it has taken firm hold of the public mind.

But setting aside these and other blemishes, which catch the eye as one turns over the pages, there is a good deal of information of a kind that is curious, and to most readers will be probably novel.

It will doubtless surprise many to note the number and variety of the animals whose skins have a marketable value, although it should be observed that the length of the list as given in the

* See 'The Zoologist,' 1879, p. 441; 1891, p. 401.

† 'Transactions of the Essex Naturalists' Field Club,' 1880; and 'Essays on Sport and Natural History,' 1883.

“Contents” is misleading, inasmuch as the same species appears under several different names, according to the country from which it comes. Thus we find the Tiger, the Bengal Tiger, the Mongolian or Chinese Tiger, and the Turkestan Tiger treated as so many distinct forms of *Felis tigris*. Similarly there are Chinese, East Indian, Persian, and African Leopards, exclusive of the Cheetah and of the Snow Leopard, or Ounce, which, according to Mr. Poland, is “not so rare an animal as many suppose; a certain number (average not stated) are imported into Russia, through Siberia, annually. The price of a good skin is from 40s. to 130s.; and 140s. is the highest price paid.” Wolves also, Foxes, Bears, and Otters appear from the “Contents” to be more numerous in point of species than they really are, in consequence of being classified topographically. In this way the Fur-seals with a dozen different names are reducible to four species.

The immense number of fur-skins imported, says Mr. Poland, will perhaps astonish many readers, the more so as the importation of some of them is increasing instead of decreasing. Certain species, especially those of large size, are steadily decreasing, but others—as the Raccoon, American and Australian Opossums—increase with the settlement of the country, feeding on the cultivated fields, and thus procuring food more readily than when the land was unreclaimed. Another cause for the increase in the quantity of skins imported is the improved facilities for transport by rail and steamer. It is instructive to compare the returns of some of the American furs imported in 1891 with those of 1881.

Furs imported from the United States and Canada.

	1881.	1891.
Beaver	58,241	11,693
Bear... ..	8,364	12,795
Otter	9,019	7,334
Fisher	4,738	2,955
Marten	36,172	38,412
Wolf... ..	2,248	10,000
Wolverine	597	738
Lynx	7,374	6,496
Fox	99,363	106,755
Mink	170,620	173,389
Raccoon	632,270	549,180

It is probable, although Mr. Poland does not mention it, that another reason for the increased number of skins, of such predatory animals as the Wolf, Wolverine, Lynx, and Fox, is the Government reward offered for their destruction. As regards the skins of Fur-seals received from America in 1881 (according to Mr. Poland's tables), the number was 210,745, and in 1891 (the last year for which the returns are tabulated) 725,731, a very considerable reduction.

Fashion, it would seem, exercises a great influence upon the prices of furs :—

“Skins that for some years have been neglected and almost unsaleable, owing to the vagaries of fashion, suddenly assume a high value, an advance of 50 or 100 per cent. in these days of quick communication and transit not being thought much of, although a rise of 30 or 40 per cent. was considered sufficient a few years ago. Any fashion, if constantly kept up, would probably lead to the extinction of many species, but its frequent changes give the animals time to increase. The Hudson's Bay Company have a good plan of passing over for a time any district that is exhausted.

“The furs of a country are, as a rule, only used to a minor extent there, a great number being exported, and, on the other hand, many foreign ones are imported, the want of one country being supplied by the abundance of another, thus stimulating and promoting commerce.”

In addition to the English names of the fur-bearing animals, which in most cases are followed by their scientific appellations, although some are not specifically identified (see pp. 145, 155, 171, 199, 304, 367—369), Mr. Poland gives the French and German names, where known, and text cuts are furnished of sixteen species. Considering the large number of species to select from, it would have been better to have dispensed with such very familiar illustrations as those of the Polar Bear, American Bison, and Kangaroo, and to have substituted figures of some less known animals. Wearers of furs, probably, would have preferred to gain some idea of the general appearance of a Chinchilla, a Mink, and a Musquash, or view the portraits of a Nandine, a Paguma, and a Pernitsky.

THE ZOOLOGIST.

THIRD SERIES.

VOL. XVII.]

OCTOBER, 1893.

[No. 202.]

DIFFERENTIATION, MIGRATION, AND MIMICRY.

BY THE REV. H. B. TRISTRAM, M.A., LL.D., F.R.S.*

IT is difficult for the mind to grasp the advance in biological science—I use the term biology in its wide etymological, not its recently restricted sense—which has taken place since I first attended the meetings of the British Association, some forty years ago. In those days, the now familiar expressions of “natural selection,” “isolation,” “the struggle for existence,” “the survival of the fittest,” were unheard of and unknown, though many an observer was busied in culling the facts which were being poured into the lap of the philosopher who should mould the first great epoch in natural science since the days of Linnæus.

It is to the importance and value of field-observation that I would venture in the first place to direct your attention.

My predecessors in this chair have been, of recent years, distinguished men who have searched deeply into the abstrusest mysteries of physiology. Thither I do not presume to follow them. I rather come before you as a survivor of the old-world naturalist, as one whose researches have been, not in the laboratory or with the microscope, but on the wide desert, the mountain side, and the isles of the sea.

This year is the centenary of the death of Gilbert White, whom we may look upon as the father of field-naturalists. It is

* Presidential Address to the Biological Section of the British Association, at Nottingham, September, 1893.

true that Sir T. Browne, Willughby, and Ray had each, in the middle of the seventeenth century, committed various observations to print; but though Willughby, at least, recognised the importance of the soft parts in affording a key to classification, as well as the osteology, as may be seen from his observation of the peculiar formation in the Divers [*Colymbidæ*] of the tibia, with its prolonged procnemial process, of which he has given a figure, or his description of the elongation of the posterior branches of the Woodpecker's tongue, as well as by his description of the intestines of all specimens which came under his notice in the flesh, none of these writers systematically noted the habits of birds, apart from an occasional mention of their nidification, and very rarely do they even describe the eggs. But White was the first observer to recognise how much may be learnt from the life habits of birds. He is generally content with recording his observations, leaving it to others to speculate. Fond of Virgilian quotations (he was a Fellow of Oriel of the last century), his quotations are often made with a view to prove the scrupulous accuracy of the Roman poet, as tested by his (White's) own observations.

In an age incredulous as to that which appears to break the uniformity of nature, but quick to recognise all the phenomena of life, a contrast arises before the mind's eye between the abiding strength of the objective method, which brings Gilbert White in touch with the great writers whose works are for all time, and the transient feebleness of the modern introspective philosophies, vexed with the problems of psychology. The modern psychologist propounds his theory of man and the universe, and we read him, and go on our way, and straightway forget. Herodotus and Thucydides tell a plain tale in plain language, or the Curate of Selborne shows us the hawk on the wing, or the snake in the grass, as he saw them day by day, and, somehow, the simple story lives, and moves him who reads it long after the subtleties of this or that philosophical theory have had their day and passed into the limbo of oblivion. But, invaluable as has been the example of Gilbert White in teaching us how to observe, his field was a very narrow one, circumscribed for the most part by the boundaries of a single parish, and on the subject of geographical distribution (as we know it now) he could contribute nothing—a subject on which even the best explorers of that day were strangely

unobservant and inexact. A century and a half ago, it had not come to be recognised that distribution is, along, of course, with morphology and physiology, a most important factor in determining the facts of biology. It is difficult to estimate what might have been gained in the case of many species, now irreparably lost, had Forster and the other companions of Captain Cook—to say nothing of many previous voyagers—had the slightest conception of the importance of noting the exact locality of each specimen they collected. They seem scarcely to have recognised the specific distinctions of the characteristic genera of the Pacific Islands at all, or, if they did, to have dismissed them with the remark, “On this island was found a Flycatcher, a Pigeon, or a Parrot similar to those found in New Holland, but with white tail-feathers instead of black, an orange instead of a scarlet breast, or red shoulders instead of yellow.” As we turn over the pages of Latham, or Shaw, how often do we find for locality one of the islands of the South Sea, and even, where the locality is given, subsequent research has proved it erroneous, as though the specimens had been subsequently ticketed; Le Vaillant described many of his South African birds from memory. Thus Latham, after describing very accurately *Rhipidura flabellifera*, from the south island of New Zealand, remarks, apparently on Forster’s authority, that it is subject to variation; that in the island of Tanna another was met with, with a different tail, &c., and that there was another variety in the collection of Sir Joseph Banks. Endless perplexity has been caused by the *Psittacus pygmæus* of Gmelin (of which Latham’s type is at Vienna) being stated in the inventory as from Botany Bay, by Latham from Otaheite, and in his book as inhabiting several of the islands of the South Seas, and now it proves to be the female *Psittacus palmarum* from the New Hebrides. These are but samples of the confusion caused by the inaccuracies of the old voyagers. Had there been in the first crew who landed on the island of Bourbon, I will not say a naturalist, but even a simple-hearted Leguat, to tell the artless tale of what he saw, or had there been among the Portuguese discoverers of Mauritius one who could note and describe the habits of its birds with the accuracy with which a Poulton could record the ways and doings of our Lepidoptera, how vastly would our knowledge of a perished fauna have been enriched! It is only since we learned from Darwin and Wallace the power of

isolation in the differentiation of species, that special attention has been paid to the peculiarities of insular forms. Here the field-naturalist comes in as the helpful servant of the philosopher and the systematist, by illustrating *the operation of isolation in the differentiation of species*. I may take the typical examples of two groups of oceanic islands, differing as widely as possible in their position on the globe, the Sandwich Islands in the centre of the Pacific, thousands of miles from the nearest Continent, and the Canaries, within sight of the African coast; but agreeing in this, that both are truly oceanic groups, of purely volcanic origin, the ocean depths close to the Canaries, and between the different islands, varying from 1500 to 2000 fathoms. In the one we may study the expiring relics of an avifauna completely differentiated by isolation; in the other we have the opportunity of tracing the incipient stages of the same process.

The Sandwich Islands have long been known as possessing an avifauna not surpassed in interesting peculiarity by that of New Zealand or Madagascar; in fact, it seems as though their vast distance from the continent had intensified the influences of isolation. There is scarcely a passerine bird in its indigenous fauna which can be referred to any genus known elsewhere. But, until the very recent researches of Mr. Scott Wilson, and the explorations of the Hon. W. Rothschild's collectors, it was not known that almost every island of the group possessed one or more representatives of each of these peculiar genera. Thus, every island which has been thoroughly explored, and in which any extent of the primeval forest remains, possesses, or has possessed, its own peculiar species of *Hemignathus*, *Himatione*, *Phæornis*, *Acrulocercus*, *Loxops*, *Drepanis*, as well as the massive-beaked finches, which emulate the *Geospiza* of the Galapagos. Prof. Newton has shown that while the greater number of these are, probably, of American origin, yet the South Pacific has contributed its quota to this museum of ornithological rarities, which Mr. C. B. Clarke (Phil. Trans. 1892, pp. 371—387) very justly proposes to make a distinct biological sub-region.

That each of the islands of this group, however small, should possess a flora specifically distinct, suggests thoughts of the vast periods occupied in their differentiation.

In the Canary Islands, either because they are geologically more recent, or because of their proximity to the African coast,

which has facilitated frequent immigrations from the continent, the process of Differentiation is only partially accomplished. Yet there is scarcely a resident species which is not more or less modified, and this modification is yet further advanced in the westernmost islands than in those nearest to Africa. In Fuertaventura and Lanzarote, waterless and treeless, there is little change, and the fauna is almost identical with that of the neighbouring Sahara. There is a Whinchat, *Pratincola dacotiæ*, discovered by my companion, Mr. Meade-Waldo, peculiar to Fuertaventura, which may possibly be found on the opposite coast, though it has not yet been met with by any collectors there. Now, our Whinchat is a common winter visitant all down the West African coast, and it seems probable that isolation has produced the very marked characters of the Canarian form, while the continental individuals have been restrained from variation by their frequent association with their migratory relations. A similar cause may explain why the Blackbird, an extremely common resident in all the Canary Islands, has not been modified in the least, since many migratory individuals of the same species sojourn every winter in these islands. Or take the Blue Titmouse, Our familiar resident is replaced along the coast of North Africa by a representative species, *Parus ultramarinus*, differentiated chiefly by a black instead of a blue cap, and a slate-coloured instead of a green back. The Titmouse of Lanzarote and Fuertaventura is barely separable from that of Algeria, but is much smaller and paler, probably owing to scarcity of food and a dry desert climate. Passing, 100 miles further to sea, to Grand Canary, we find in the woods and forests a bird in all respects similar to the Algerian in colour and dimensions, with one exception—the greater wing-coverts of the Algerian are tipped with white, forming a broad bar when the wing is closed. This, present in the Fuertaventura form, is represented in the Canarian by the faintest white tips, and in the birds from the next islands, Tenerife and Gomera, this is altogether absent. This form has been recognised as *P. tenerifæ*. Proceeding to the north-west outermost island, Palma, we find a very distinct species, with different proportions, a longer tail, and white abdomen instead of yellow. In the Ultima Thule, Hierro, we find a second very distinct species, resembling that of Tenerife in the absence of the wing bar and in all other respects, except that the back is green

like the European, instead of slate as in all the other species. Thus we find in this group a uniform graduation of variation as we proceed further from the cradle of the race.

A similar series of modifications may be traced in the Chaffinch (*Fringilla*), which has been in like manner derived from the North African *F. spodiogena*, and in which the extreme variation is to be found in the westernmost islands of Palma and Hierro. The Willow Wren, *Phylloscopus trochilus*, extremely numerous and *resident*, has entirely changed its habits, though not its plumage, and I have felt justified in distinguishing it as *P. fortunatus*. In note and habits it is entirely different from our bird, and though it builds a domed nest it is always near the top of lofty trees, most frequently in palm-trees. The only external difference from our bird consists in its paler tarsi and more rounded wing, so that its power of flight is weaker, but, were it not for the marked difference in its habits and voice, I should have hesitated to differentiate it. In the Kestrel and Great Spotted Woodpecker there are differences which suggest incipient species, while the forests of the wooded western islands yield two very peculiar Pigeons, differing entirely from each other in their habits, both probably derived from our Wood Pigeon, but even further removed from it than the *Columba trocaz* of Madeira, and by their dark chestnut coloration, suggesting that peculiar food, in this case the berries of the tree laurel, has its full share in the differentiation of isolated forms. If we remember the variability of the pigments in the food of birds, and the amount absorbed and transferred to the skin and plumage, the variability in the tints and patterns of many animals can be more readily understood.

One other bird deserves notice, the *Caccabis*, or Red-legged Partridge, for here, and here alone, we have chronological data. The Spaniards introduced *Caccabis rufa* into Canary, and *C. petrosa* into Tenerife and Gomera, and they have never spread from their respective localities. Now, both species, after a residence of only 400 years, have become distinctly modified. *C. rufa* was introduced into the Azores also, and changed exactly in the same manner, so much so that Mr. Godman, some years ago, in his 'Natural History of the Azores,' would have described it as distinct, but that the only specimen he procured was in moult and mutilated, and it now proves identical with the

Canarian bird. Besides minor differences, the beak is one-fourth stouter and longer than in the European bird, the tarsus very much stouter and longer, and the back is grey rather than russet. The grey back harmonises with the volcanic dark soil of the rocks of the Canaries, as the russet does with the clay of the plains of England and France. In the Canaries the bird lives under different conditions from those of Europe. It is on the mountain sides and among rocks that the stouter beak and stronger legs are indispensable to its vigorous existence. It is needless to go into the details of many other species. We have here the effect of changed conditions of life in 400 years. What may they not have been in 400 centuries? We have the result of peculiar food in the Pigeons, and of isolation in all the cases I have mentioned. Such facts can only be supplied to the generaliser and the systematist through the accurate and minute observations of the field-naturalist.

The character of the avifauna of the Comoro Islands, to take another insular group, seems to stand midway in the differentiating process between the Canaries and the Sandwich Islands. From the researches of M. Humblot, worked out by MM. Milne-Edwards and Oustalet, we find that there are twenty-nine species acknowledged as peculiar; two species from South Africa and twenty-two from Madagascar in process of specification, called by M. Milne-Edwards secondary or derived species.

The little Christmas Island, an isolated rock 200 miles south of Java, only twelve miles in length, has been shown by Mr. Lister to produce distinct and peculiar forms of every class of life, vegetable and animal. Though the species are few in number, yet every mammal and land bird is endemic; but, as Darwin remarks, to ascertain whether a small isolated area, or a large open area like a continent, has been more favourable for the production of new organic forms, we ought to make the comparison between equal times, and this we are incapable of doing. My own attention was first directed to this subject when, in the year 1857-58, I spent many months in the Algerian Sahara, and noticed the remarkable variations in different groups, according to elevation from the sea, and the difference of soil and vegetation. The 'Origin of Species' had not then appeared; but on my return my attention was called to the communication of Darwin and Wallace to the Linnean Society* on the tendencies of species to

* Journ. Linn. Soc. vol. iii. (1859), pp. 45-62.

form varieties, and on the perpetuation of varieties and species by means of natural selection. I then wrote ('Ibis,' 1859, pp. 429—433):—"It is hardly possible, I should think, to illustrate this theory better than by the Larks and Chats of North Africa. In all these, in the congeners of the Wheatear, of the Rock Chat, of the Crested Lark, we trace gradual modifications of coloration and of anatomical structure, deflecting by very gentle gradations from the ordinary type, but, when we take the extremes, presenting the most marked differences. . . . In the desert, where neither trees, brushwood, nor even undulations of surface, afford the slightest protection to an animal from its foes, a modification of colour, which shall be assimilated to that of the surrounding country, is absolutely necessary. Hence, without exception, the upper plumage of every bird—whether Lark, Chat, Sylvia, or Sand Grouse—and also the fur of all the smaller mammals, and the skin of all the Snakes and Lizards, is of the uniform isabelline or sand-colour. It is very possible that some further purpose may be served by the prevailing colours, but this appears of itself a sufficient explanation. There are individual varieties of depth of hue among all creatures. In the struggle for life which we know to be going on among all species, a very slight change for the better, such as improved means of escape from its natural enemies (which would be the effect of an alteration from a conspicuous colour to one resembling the hue of the surrounding objects), would give the variety that possessed it a decided advantage over the typical or other forms of the species. . . . To apply the theory to the case of the Sahara. If the Algerian Desert were colonised by a few pairs of Crested Larks—putting aside the ascertained fact of the tendency of an arid, hot climate to bleach all dark colours—we know that the probability is that one or two pairs would be likely to be of a darker complexion than the others. These, and such of their offspring as most resembled them, would become more liable to capture by their natural enemies, hawks and carnivorous beasts. The lighter-coloured ones would enjoy more or less immunity from such attacks. Let this state of things continue for a few hundred years and the dark-coloured individuals would be exterminated, the light-coloured remain and inherit the land. This process, aided by the above-mentioned tendency of the climate to bleach the coloration still more, would in a few centuries produce the *Galerita abyssinica* as the typical form;

and it must be noted that between it and the European *G. cristata* there is no distinction but that of colour.

“But when we turn to *Galerita isabellina*, *G. arenicola*, and *G. macrorhyncha*, we have differences not only of colour, but of structure. These differences are most marked in the form of the bill. Now, to take the two former first, *G. arenicola* has a very long bill, *G. isabellina* a very short one; the former resorts exclusively to the deep, loose, sandy tracts, the latter haunts the hard and rocky districts. It is manifest that a bird whose food has to be sought for in deep sand derives a great advantage from any elongation, however slight, of its bill. The other, which feeds among stones and rocks, requires strength rather than length. We know that even in the type species the size of the bill varies in individuals—in the Lark as well as in the Snipe. Now, in the desert, the shorter-billed varieties would undergo comparative difficulty in finding food where it was not abundant, and consequently would not be in such vigorous condition as their longer-billed relations. In the breeding season, therefore, they would have fewer eggs and a weaker progeny. Often, as we know, a weakly bird will abstain from matrimony altogether. The natural result of these causes would be that in course of time the longest-billed variety would steadily predominate over the shorter, and, in a few centuries, they would be the sole existing race; their shorter-billed fellows dying out until that race was extinct. The converse will still hold good of the stout-billed and weaker-billed varieties in a rocky district.

“Here are only two causes enumerated which might serve to create as it were, a new species from an old one. Yet they are perfectly natural causes, and such as I think must have occurred, and are possibly occurring still. We know so very little of the causes which, in the majority of cases, make species rare or common, that there may be hundreds of others at work, some even more powerful than these, which go to perpetuate and eliminate certain forms ‘according to natural means of selection.’”

It would appear that those species in continental areas are equally liable to variation with those which are isolated in limited areas, yet that there are many counteracting influences which operate to check this tendency. It is often assumed, where we find closely allied species apparently inter-breeding at the centre

of their area, that the blending of forms is caused by the two races commingling. Judging from insular experience I should be inclined to believe that the theory of inter-breeding is beginning at the wrong end, but rather that while the generalised forms remain in the centre of distribution, we find the more decidedly distinct species at the extremes of the range, caused not by inter-breeding, but by differentiation. To illustrate this by the group of the Blue Titmouse. We find in Central Russia, in the centre of distribution of the family, the most generalised form, *Parus pleskii*, partaking of the characters of the various species east, west, and south. In the north-east and north it becomes differentiated as *P. cyaneus*; to the south-west and west into *P. cæruleus* and its various sub-species, while a branch extending due east has assumed the form of *P. flavipectus*, bearing traces of affinity to its neighbour *P. cyaneus* in the north, which seems evidently to have been derived from it.

But the scope of field observation does not cease with geographical distribution and modification of form. The closet systematist is very apt to overlook or to take no count of habits, voice, modification, and other features of life which have an important bearing on the modification of species. To take one instance, the Short-toed Lark (*Calandrella brachydactyla*) is spread over the countries bordering on the Mediterranean; but, along with it, in Andalusia alone is found another species, *C. bætica*, of a rather darker colour, and with the secondaries generally somewhat shorter. Without further knowledge than that obtained from a comparison of skins, it might be put down as an accidental variety. But the field naturalist soon recognises it as a most distinct species. It has a different voice, a differently shaped nest; and, while the common species breeds in the plains, this one always resorts to the hills. The Spanish shepherds on the spot recognise their distinctness, and have a name for each species. Take, again, the eastern form of the common Song Thrush. The bird of North China, *Turdus auritus*, closely resembles our familiar species, but is slightly larger, and there is a minute difference in the wing formula. But the field naturalist has ascertained that it lays eggs like those of the Missel Thrush, and it is the only species closely allied to our bird which does not lay eggs of a blue ground colour. The Hedge Accentor of Japan (*Accentor rubidus*) is distinguished from our most familiar friend,

A. modularis, by delicate difference of hue. But, though in gait and manner it closely resembles it, I was surprised to find the Japanese bird strikingly distinct in habits and life, being found only in forest and brushwood several thousand feet above the sea. I met with it first at Chiussenze—6000 feet—before the snow had left the ground, and in summer it goes higher still, but never descends to the cultivated land. If both species are derived, as seems probable, from *A. immaculatus* of the Himalayas, then the contrast in habits is easily explained. The lofty mountain ranges of Japan have enabled the settlers there to retain their original habits, for which our humbler elevations have afforded no scope.

On the solution of the problem of *the Migration of birds*, the most remarkable of all the phenomena of animal life, much less aid has been contributed by the observations of field naturalists than might reasonably have been expected. The facts of migration have, of course, been recognised from the earliest times, and have afforded a theme for Hebrew and Greek poets 3000 years ago. Theories which would explain it are rife enough, but it is only of late years that any systematic effort has been made to classify and summarise the thousands of data and notes which are needed in order to draw any satisfactory conclusion. The observable facts may be classified as to their bearing on the whither, when, and how of migration, and after this we may possibly arrive at a true answer to the Why? Observation has sufficiently answered the first question, Whither?

There are scarcely any feathered denizens of earth or sea to the summer and winter ranges of which we cannot now point. Of almost all the birds of the holarctic fauna, we have ascertained the breeding-places and the winter resorts. Now that the Knot and the Sanderling have been successfully pursued even to Grinnell Land, there remains but the Curlew Sandpiper (*Tringa subarquata*), of all the known European birds, whose breeding-ground is a virgin soil, to be trodden, let us hope, in a successful exploration by Nansen, on one side or other of the North Pole. Equally clearly ascertained are the winter quarters of all the migrants. The most casual observer cannot fail to notice in any part of Africa, north or south, west coast or interior, the myriads of familiar species which winter there. As to the time of migration, the earliest notes of field-naturalists have been the records of the dates of arrival of the feathered visitors. We possess

them for some localities, as for Norfolk by the Marsham family, so far back as 1736. In recent years these observations have been carried out on a larger and more systematic scale, by Middendorff, who, forty years ago, devoted himself to the study of the lines of migration in the Russian Empire, tracing what he called the *isopipteses*, the lines of simultaneous arrival of particular species, and by Professor Palmén, of Finland, who, twenty years later, pursued a similar course of investigation; and by Professor Baird on the migration of North American birds; and subsequently by Severtzoff as regards Central Asia, and Menzbier as regards Eastern Europe. As regards our own coasts, a vast mass of statistics has been collected by the labours of the Migration Committee appointed by the British Association in 1880, for which our thanks are chiefly due to the indefatigable zeal of Mr. J. Cordeaux, and his colleague Mr. J. A. Harvie Brown, the originators of the scheme by which the lighthouses were for nine years used as posts of observation on migration. The reports of that Committee are familiar to us, but the inferences are not yet worked out. I cannot but regret that the Committee has been allowed to retire. Professor W. W. Cooke has been carrying on similar observations in the Mississippi Valley, and others, too numerous to mention, have done the same elsewhere. But, as Professor Newton has truly said, all these efforts may be said to pale before the stupendous amount of information amassed during more than fifty years by the venerable Herr Gätke of Heligoland, whose work we earnestly desire may soon appear in an English version.

We have, through the labours of the writers I have named, and many others, arrived at a fair knowledge of the When? of migration. Of the How? we have ascertained a little, but very little. The lines of migration vary widely in different species, and in different longitudes. The theory of migration being directed towards the magnetic pole, first started by Middendorff, seems to be refuted by Baird, who has shown that in North America the theory will not hold. Yet, in some instances, there is evidently a converging tendency in northward migrations. The line, according to Middendorff, in Middle Siberia is due north, in Eastern Siberia S.E. to N.W., and in Western Siberia from S.W. to N.E. In European Russia Menzbier traces four northward routes: (1) A coast line coming up from Norway round the North

Cape to Nova Zembla. (2) The Baltic line with bifurcation, one proceeding by the Gulf of Bothnia, and the other by the Gulf of Finland, which is afterwards again subdivided. (3) A Black Sea line, reaching nearly as far north as the valley of the Petchora. (4) The Caspian line, passing up the Volga, and reaching as far east as the valley of the Obi by other anastomosing streams.

Palmén has endeavoured to trace the lines of migration on the return autumnal journey in the eastern hemisphere, and has arranged them in nine routes: (1) From Nova Zembla, round the West of Norway, to the British Isles. (2) From Spitzbergen, by Norway, to Britain, France, Portugal, and West Africa. (3) From North Russia, by the Gulf of Finland, Holstein, and Holland, and then bifurcating to the west coast of France on the one side, and on the other up the Rhine to Italy and North Africa. (4 *a*) Down the Volga by the Sea of Azof, Asia Minor, and Egypt, while the other portion (4 *b*), trending east, passes by the Caspian and Tigris to the Persian Gulf. (5) By the Yenesei to Lake Baikal and Mongolia. (6) By the Lena on to the Amoor and Japan. (7) From East Siberia to the Corea and Japan. (8) Kamschatka to Japan and the Chinese coast. (9) From Greenland, Iceland, and the Faroes, to Britain, where it joins line 2.

All courses of rivers of importance form minor routes, and consideration of these lines of migration might serve to explain the fact of North American stragglers, the waifs and strays which have fallen in with great flights of the regular migrants, having been more frequently shot on the east coast of England than on the west coast, or in Ireland. They have not crossed the Atlantic, but have come from the far north, where a very slight deflection east or west might alter their whole course, and in that case they would naturally strike either Iceland or the west coast of Norway, and in either case would reach the east coast of Britain. But, if by storms, and the prevailing winds of the North Atlantic coming from the west, they had been driven out of their usual course, they would strike the coast of Norway, and so find their way hither in the company of their congeners.

As to the elevation at which migratory flights are carried on, Herr Gätke, as well as many American observers, holds that it is generally far above our ken, at least in normal conditions of the atmosphere, and that the opportunities of observation, apart from

seasons and unusual atmospheric disturbance, are confined chiefly to unsuccessful and abortive attempts. It is maintained that the height of flight is some 1500 to 15,000 feet; and if this be so, as there seems every reason to admit, the aid of land bridges and river valleys becomes of very slight importance. A trivial instance will illustrate this. There are two species of Blue-throat, *Cyanecula suecica* and *C. leucocyana*: the former with its red breast patch is abundant in Sweden in summer, but is never found in Germany, except most accidentally, as the other is the common form of Central Europe. Yet both are abundant in Egypt and Syria, where they winter, and I have, on several occasions, obtained both species out of the same flock. Hence we infer that the Swedish bird makes its journey from its winter quarters with scarcely a halt, while the other proceeds leisurely to its nearer summer quarters. On the other hand, I have more than once seen myriads of Swallows, Martins, Sand Martins, and, later in the season, Swifts, passing up the Jordan Valley and along the Bukaa of Central Syria, at so slight an elevation that I was able to distinguish at once whether the flight consisted of Swallows or House Martins. This was in perfectly calm clear weather. One stream of Swallows, certainly not less than a quarter of a mile wide, occupied more than half an hour in passing over one spot; and flights of House Martins, and then of Sand Martins, the next day, were scarcely less numerous. These flights must have been straight up from the Red Sea, and may have been the general assembly of all those which had wintered in East Africa. I cannot think that these flights were more than 1000 feet high. On the other hand, when standing on the highest peak in the Island of Palma, 6500 feet, with a dense mass of clouds beneath us, leaving nothing of land or sea visible, save the distant peak of Tenerife, 13,000 feet, I have watched a flock of Cornish Choughs soaring above us, till at length they were absolutely undistinguishable by us except with field-glasses.

As to the speed with which the migration flights are accomplished, they require much further observation. Herr Gätke maintains that Godwits and Plovers can fly at the rate of 240 miles an hour (!), and the late Dr. Jerdon stated that the Spine-tailed Swift (*Acanthyllis caudacutus*), roosting in Ceylon, would reach the Himalayas (1200 miles) before sunset. Certainly in their ordinary flight the Swift is the only bird I have

ever noticed to outstrip an express train on the Great Northern Railway.

Observation has shown us that, while there is a regular and uniform migration in the case of some species, yet that, beyond these, there comes a partial migration of some species, immigrants and emigrants simultaneously, and this, besides the familiar vertical emigration from higher to lower altitudes and *vice versa*, as in the familiar instance of the Lapwing and Golden Plover. There is still much scope for the field-naturalist in observation of these partial migrations. There are also species in which some individuals migrate and some are sedentary; *e. g.* in the few primeval forests which still remain in the Canary Islands, and which are enshrouded in almost perpetual mist, the Woodcock is sedentary, and not uncommon. I have often put up the bird and seen the eggs; but in winter the number is vastly increased, and the visitors are easily to be distinguished from the residents by their lighter colour and larger size. The resident never leaves the cover of the dense forest, where the growth of ferns and shrubs is perpetual, and fosters a moist, rich, semi-peaty soil, in which the Woodcock finds abundant food all the year, and has thus lost its migratory instincts.

But why do birds migrate? Observation has brought to light many facts which seem to increase the difficulties of a satisfactory answer to the question. The autumnal retreat from the breeding quarters might be explained by a want of sufficient sustenance as winter approaches in the higher latitudes; but this will not account for the return migration in spring, since there is no perceptible diminution of supplies in the winter quarters. A friend of mine, who was for some time stationed as missionary at Kikombo, on the high plateau south-east of Victoria Nyanza Lake, almost under the equator, where there is no variation in the seasons, wrote to me that from November to March the country swarmed with Swallows and Martins, which seemed to the casual observer to consist almost wholly of our three species, though occasionally a few birds of different type might be noticed in the larger flocks. Towards the end of March, without any observable change in climatic or atmospheric conditions, nine-tenths of the birds suddenly disappeared, and only a sprinkling remained. These, which had previously been lost amid the myriad of winter visitants, seemed to consist of four species, of

which I received specimens of two, *Hirundo puella* and *H. senegalensis*. One, described as white underneath, is probably *H. aethiopica*; and the fourth, very small and quite black, must be a *Psalidoprocne*. All these remained through spring and summer. The northward movement of all the others must be through some impulse not yet ascertained. In many other instances observation has shown that the impulse of movement is not dependent on the weather at the moment. This is especially the case with sea birds. Professor Newton observes they can be trusted as the almanack itself. Foul weather or fair, heat or cold, the Puffins, *Fratercula arctica*, repair to some of their stations punctually on a given day, as if their movements were regulated by clockwork. In like manner, whether the summer be cold or hot, the Swifts leave their summer home in England about the first week in August, only occasional stragglers ever being seen after that date. So in three different years in Syria I noticed the appearance of the Common Swift (*Cypselus apus*) in myriads on one day in the first week in April. In the case of almost all the land birds, it has been ascertained by repeated observations that the male birds arrive some days before the hens. I do not think it is proved that they start earlier; but, being generally stronger than the females, it is very natural that they should outstrip their weaker mates. I think, too, that there is evidence that those species which have the most extended southerly, have also the most extended northerly range. The same may hold good of individuals of the same species, and may be accounted for by, or account for, the fact that, *e. g.*, the individuals of the Wheatear or of the Willow Wren which penetrate furthest north have longer and stronger wings than those individuals which terminate their journey in more southern latitudes. The length of wing of two specimens of *Saxicola œnanthe* in my collection, from Greenland and Labrador, exceeds by 0·6 the length of British and Syrian specimens, and the next longest, exceeding them by 0·5 inch, is from the Gambia. So the sedentary *Phylloscopus trochilus* of the Canaries has a perceptibly shorter wing than European specimens.

To say that migration is performed by instinct is no explanation of the marvellous faculty,—it is an evasion of the difficulty. Professor Möbius holds that birds crossing the ocean may be guided by observing the rolling of the waves; but this will not

hold good in the varying storms of the Atlantic, still less in the vast stretch of stormy and landless ocean crossed by the Bronze Cuckoo (*Chrysococcyx lucidus*) in its passage from New Guinea to New Zealand. Professor Palmén ascribes the due performance of the flight to experience, but this is not confirmed by field observers. He assumes that the flights are led by the oldest and strongest; but observation by Herr Gätke has shown that among migrants, as the young and old journey apart and by different routes, the former can have had no experience. All ornithologists are aware that the parent Cuckoos leave this country long before their young ones are hatched by their foster-parents. The sense of sight cannot guide birds which travel by night, or span oceans or continents in a single flight. In noticing all the phenomena of migration, there yet remains a vast untilled region for the field-naturalist.

What Professor Newton terms "the sense of direction, unconsciously exercised," is the nearest approach yet made to a solution of the problem. He remarks how vastly the sense of direction varies in human beings, contrasting its absence in the dwellers in towns compared with the power of the shepherd and the countryman, and, infinitely more, with the power of the savage or the Arab. He adduces the experience of Middendorff among the Samojeds, who know how to reach their goal by the shortest way through places wholly strange to them. He had known it among dogs and horses (as we may constantly perceive), but was surprised to find the same incomprehensible animal-faculty unweakened among uncivilised men. Nor could the Samojeds understand his enquiry, how they did it? They disarmed him by the question, How now does the Arctic Fox find its way aright on the Tundra, and never go astray? and Middendorff adds, "I was thrown back on the unconscious performance of an inherited animal-faculty"; and so are we!

There is one more kind of migration, on which we know nothing, and where the field-naturalist has still abundant scope for the exercise of observation. I mean what is called exceptional migration, not the mere wanderings of waifs and strays, nor yet the uncertain travels of some species, as the Crossbill in search of food, but the colonising parties of many gregarious species, which generally, so far as we know in our own hemisphere, travel from east to west, or from south-east to north-west. Such are

the Waxwing, *Ampelis garrula*, the Pastor Starling, *Pastor roseus*, and Pallas's Sand Grouse, after an interval sometimes of many years, or sometimes for two or three years in succession. The Waxwing will overspread Western Europe in winter for a short time. It appears to be equally inconstant in its choice of summer quarters, as was shown by Mr. J. Wolley in Lapland. The Rose Pastor regularly winters in India, but never remains to breed. For this purpose the whole race seems to collect and travel north-west, but rarely, or after intervals of many years, returns to the same quarters. Verona, Broussa, Smyrna, Odessa, the Dobrudscha have all during the last half-century been visited for one summer by tens of thousands, who are attracted by the visitations of locusts, on which they feed, rear their young, and go. These irruptions, however, cannot be classed under the laws of ordinary migration. Not less inexplicable are such migrations as those of the African Darter, which, though never yet observed to the north of the African lakes, contrives to pass, every spring, unobserved to the lake of Antioch in North Syria, where I found a large colony rearing their young, and which, so soon as their progeny was able to fly, disappeared to the south-east as suddenly as they had arrived.

There is one possible explanation of "the sense of direction unconsciously exercised," which I submit as a working hypothesis. We are all aware of the instinct, strong both in mammals and birds without exception, which attracts them to the place of their nativity. When the increasing cold of the northern regions, in which they all had their origin, drove the mammals southward, they could not retrace their steps, because the increasing polar sea, as the arctic continent sank, barred the way. The birds reluctantly left their homes as winter came on, and followed the supply of food. But as the season in their new residence became hotter in summer, they instinctively returned to their birth-places, and there reared their young, retiring with them when the recurring winter impelled them to seek a warmer climate. Those species which, unfitted for a greater amount of heat by their more protracted sojourn in the northern regions, persisted in revisiting their ancestral homes, or getting as near to them as they could, retained a capacity for enjoying a temperate climate, which, very gradually, was lost by the species which settled down more permanently in their new quarters, and thus a law of migration

became established on the one side, and sedentary habits on the other.

If there be one question on which the field-naturalist may contribute, as lion's provider to the philosopher, more than another, it is on the now much disputed topic of "mimicry," whether protective or aggressive. As Mr. Beddard has remarked on this subject, "The field of hypothesis has no limits, and what we need is more study"—and, may we not add, more accurate observation of facts. The theory of protective mimicry was first propounded by Mr. H. W. Bates, from his observations on the Amazon. He found that the group of butterflies, *Heliconiidae*, conspicuously banded with yellow and black, were provided with certain glands which secrete a nauseating fluid, supposed to render them unpalatable to birds. In the same districts he found also similarly coloured butterflies, belonging to the family *Pieridae*, which so closely resembled the others in shape and markings as to be easily mistaken for them, but which, unprovided with such secreting glands, were unprotected from the attacks of birds. This resemblance, he thought, was brought about by natural selection for the protection of the edible butterflies, through the birds mistaking them for the inedible kinds. Other cases of mimicry among a great variety of insects have since been pointed out, and the theory of protective mimicry has gained many adherents. Among birds, many instances have been adduced. Mr. Wallace has described the extraordinary similarity between birds of very different families, *Oriolus bouruensis* and *Philemon moluccensis*, both peculiar to the island of Bouru. Mr. H. O. Forbes has discovered a similar brown Oriole, *Oriolus decipiens*, as closely imitating the appearance of the *Philemon timorlauenensis* of Timorlaut. A similar instance occurs in Ceram. But Mr. Wallace observes that, while usually the mimicking species is less numerous than the mimicked, the contrary appears to be the case in Bouru, and it is difficult to see what advantage has been gained by the mimicry. Now, all the species of *Philemon* are remarkably sombre-coloured birds, and the mimicry cannot be on their side. But there are other brown Orioles, very closely resembling those named, in other Moluccan islands, and yet having no resemblance to the *Philemon* of the same island, as may be seen in the case of the *Oriolus phæochromus* and *Philemon gilolensis* from Gilolo. Yet the Oriole has adopted the same livery which elsewhere is a

perfect mimicry. May it not therefore be that we have, in this group of brown Orioles, the original type of the family, undifferentiated? As they spread east and south we may trace the gradation, through the brown striation of the New Guinea bird, to the brighter, green-tinged form of the West Australian and the green plumage of the Southern Australian, while westward the brilliant yellows of the numerous Indian and African species were developed, and another group, preferring higher elevations, passing through the mountain ranges of Java, Sumatra, and Borneo, intensified the aboriginal brown into black, and hence were evolved the deep reds of the various species which culminate in the crimson of Formosa, *Oriolus ardens*, and the still deeper crimsons of *O. trailli* of the Himalayas.

It is possible that there may be similarity without mimicry, and, by the five laws of mimicry as laid down by Wallace, very many suggested cases must be eliminated. We all know that it is quite possible to find between species of very different genera extraordinary similarity which is not mimetic. Take, for instance, the remarkable identity of coloration in the case of some of the African species *Macronyx* and the American *Sturnella*, or, again, of some of the African *Campephagæ* and the American *Agelæus*. The outward resemblance occurs in both cases in the red as well as in the yellow-coloured species of all four groups. But we find that the *Macronyx* of America and the *Campephagæ* of Africa, in acquiring this coloration, have departed widely from the plain colour found in their immediate relatives. If we applied Mr. Scudder's theory on insects, we must imagine that the prototype form has become extinct, while the mimicker has established its position. This is an hypothesis which it is easier to suggest than either to prove or disprove. Similar cases may frequently be found in Botany. The strawberry is not indigenous in Japan, but in the mountains there I found a *Potentilla* in fruit which actually mimicked the Alpine strawberry in the minutest particulars, in its runners, its blossoms, and fruit; but the fruit was simply dry pith, supporting the seeds and retaining its colour without shrinking, or falling from the stalk for weeks—a remarkable case, we cannot say of unconscious mimicry, but of unconscious resemblance. Mimicry in birds is comparatively rare, and still rarer in mammals, which is not surprising when we consider how small is the total number of the Mammalia, and

even of birds, compared with the countless species of invertebrates. Out of the vast assemblage of insects, with their varied colours and patterns, it would be strange if there were not many cases of accidental resemblance. A strict application of Wallace's five laws would, perhaps, if all the circumstances were known, eliminate many accepted instances.

As to cases of edible insects mimicking inedible ones, Mr. Poulton admits that even unpalatable animals have their special enemies, and that the enemies of palatable animals are not indefinitely numerous.

Mr. Beddard gives tables of the results obtained by Weismann, Poulton, and others, which show that it is impossible to lay down any definite law upon the subject, and that the likes and dislikes of insect-eating animals are purely relative.

One of the most interesting cases of mimicry is that of the *Volucella*, a genus of Diptera, whose larvæ live on the larvæ of Hymenoptera, and of which the perfect insect closely resembles some species of humble-bee. Though this fact is unquestioned, yet it has recently given rise to a controversy, which, so far as one who has no claim to be an entomologist can judge, proves that, while there is much that can be explained by mimicry, there is, nevertheless, a danger of its advocates pressing it too far. *Volucella bombylans* occurs in two varieties, which prey upon the humble-bees, *Bombus muscorum* and *B. lapidarius*, which they respectively resemble. Mr. Bateson does not question the behaviour of the *Volucella*, but states that neither variety specially represents *B. muscorum*, and yet that they deposit their eggs more frequently in their nests than in the nests of other species which they resemble more closely. He also states that in a show-case in the Royal College of Surgeons, to illustrate mimicry, two specimens of another species, *B. sylvarum*, were placed alongside of the *Volucella*, which they do resemble, but were labelled *B. muscorum*.

But Mr. Hart explains the parasitism in another way. He states that a nest of *B. muscorum* is made on the surface, without much attempt at concealment, and that the bee is a peculiarly gentle species, with a very feeble sting; but that the species which the *Volucella* most resemble are irascible, and therefore more dangerous to intruders. If this be so, it is difficult to see why the *Volucella* should mimic the bee, which it does not affect, more closely than the one which is generally its victim. I do not

presume to express any opinion further than this, that the instances I have cited show that there is much reason for further careful observation by the field naturalist, and much yet to be discovered by the physiologist and the chemist, as to the composition and nature of animal pigments.

I had proposed to occupy a considerable portion of my address with a statement of the present position of the controversy on heredity, by far the most difficult and important of all those subjects which at present attract the attention of the biologist; but an attack of illness has compelled me to abandon my purpose. Not that I proposed to venture to express any opinions of my own, for, with such protagonists in the field as Weismann, Wallace, Romanes, and Poulton on the one side, and Herbert Spencer and Hartog on the other, "*Non nostrum inter vos tantas componere lites.*"

So far as I can understand Weismann's theory, he assumes the separation of germ cells and somatic cells, and that each germ cell contains in its nucleus a number of "ids," each "id" representing the personality of an ancestral member of the species, or of an antecedent species. "The first multicellular organism was probably a cluster of similar cells, but these units soon lost their original homogeneity. As the result of mere relative position, some of the cells were especially fitted to provide for the nutrition of the colony, while others undertook the work of reproduction." The latter, or germ-plasm, he assumes to possess an unlimited power of continuance, and that life is endowed with a fixed duration, not because it is contrary to its nature to be unlimited, but because the unlimited existence of individuals would be a luxury without any corresponding advantage.

Herbert Spencer remarks upon this:—"The changes of every aggregate, no matter of what kind, inevitably end in a state of equilibrium. Suns and planets die, as well as organisms." But has the theory been proved, either by the histologist, the microscopist, or the chemist? Spencer presses the point that the immortality of the protozoa has not been proved. And, after all, when Weismann makes the continuity of the germ-plasm the foundation of a theory of heredity, he is building upon a pure hypothesis.

From the continuity of the germ-plasm, and its relative segregation from the body at large, save with respect to nutrition,

he deduces, *à priori*, the impossibility of characters acquired by the body being transmitted through the germ-plasm to the offspring. From this he implies that where we find no intelligible mechanism to convey an imprint from the body to the germ, there no imprint can be conveyed. Romanes has brought forward many instances which seem to contradict this theory, and Herbert Spencer remarks that "a recognised principle of reasoning—'the law of parsimony'—forbids the assumption of more causes than are needful for the explanation of phenomena. We have evident causes which arrest the cell multiplication, therefore it is illegitimate to ascribe this arrest to some property inherent in the cells."

With regard to the reduction or disappearance of an organ, he states "that when natural selection, either direct or reverse, is set aside, why the mere cessation of selection should cause decrease of an organ, irrespective of the direct effects of disease, I am unable to see. Beyond the production of changes in the size of parts, by the selection of fortuitously arising variation, I can see but one other cause for the production of them—the competition among the parts for nutriment. . . . The active parts are well supplied, while the inactive parts are ill supplied and dwindle, as does the arm of the Hindu fakir. This competition is the cause of economy of growth—this is the cause of decrease from disease."

I may illustrate Mr. Herbert Spencer's remarks by the familiar instance of the pinions of the Kakapo (*Stringops*)—still remaining, but powerless for flight.

As for acquired habits, such as the modification of bird architecture by the same species under changed circumstances, how they can be better accounted for than by hereditary transmitted instinct, I do not see. I mean such cases as the ground-nesting *Didunculus* in Samoa having saved itself from extinction since the introduction of cats, by roosting and nesting in trees; or the extraordinary acquired habit of the Blackcap in the Canaries, observed by Dr. Lowe, of piercing the calyx of *Hibiscus rosa-sinensis*—an introduced plant—to attract insects, for which he quietly sits waiting. So the lying low of a covey of Partridges under an artificial Kite would seem to be a transmitted instinct from a far-off ancestry not yet lost; for many generations of Partridges, I fear, must have passed since the last Kite hovered

over the forefathers of an English Partridge, save in very few parts of the island.

I cannot conclude without recalling that the past year has witnessed the severance of the last link with the pre-Darwinian naturalists in the death of Sir Richard Owen. Though never himself a field-worker, or the discoverer of a single animal living or extinct, his career extends over the whole history of palæontology. I say palæontology, for he was not a geologist in the sense of studying the order, succession, area, structure, and disturbance of strata. But he accumulated facts on the fossil remains that came to his hands, till he won the fame of being the greatest comparative anatomist of the age. To him we owe the building up of the skeletons of the giant *Dinornithidæ*, and many other of the perished forms of the gigantic Sloths, Armadilloes, and Mastodons of South America, Australia, and Europe. He was himself a colossal worker, and he never worked for popularity. He had lived and worked too long before the Victorian age to accept readily the doctrines which have revolutionised that science, though none has had a larger share in accumulating the facts, the combination of which of necessity produced that transformation. But, though he clung fondly to his old idea of the archetype, no man did more than Owen to explode the rival theories of both Wernerians and Huttonians, till the controversies of Plutonians and Neptunians come to us from the far past with as little to move our interest as the blue and green controversies of Constantinople.

Nor can we forget that it is to Sir Richard's indomitable perseverance that we owe the magnificent palace which contains the national collections in Cromwell Road. For many years he fought the battle almost alone. His demand for a building of two stories, covering five acres, was denounced as audacious. The scheme was pronounced foolish, crazy, and extravagant; but, after twenty years' struggle, he was victorious, and in 1872 the Act was passed which gave not five, but more than seven acres for the purpose. Owen retired from its direction in 1883, having achieved the crowning victory of his life. Looking back in his old age on the scientific achievements of the past, he fully recognised the prospects of still further advances, and observed, "The known is very small compared with the knowable, and we may trust in the Author of all truth, who, I think, will not let that truth remain for ever hidden."

I have endeavoured to show that there is still room for all workers, that the naturalist has his place, though the morphologist and the physiologist have rightly come into far greater prominence, and we need not yet abandon the field-glass and the lens for the microscope and the scalpel. The studies of the laboratory still leave room for the observations of the field. The investigation of muscles, the analysis of brain tissue, the research into the chemical properties of pigment, have not rendered worthless the study and observation of life and habits. As you cannot diagnose the Red Indian and the Anglo-Saxon by a comparison of their respective skeletons or researches into their muscular structure, but require to know the habits, the language, the modes of thought of each; so the mammal, the bird, and even the invertebrate, has his character, his voice, his impulses, aye, I will add, his ideas, to be taken into account in order to discriminate him. There is something beyond matter in life, even in its lowest forms. I may quote on this the caution uttered by a predecessor of mine in this chair (Professor Milnes Marshall): "One thing above all is apparent, that embryologists must not work single-handed; must not be satisfied with an acquaintance, however exact, with animals from the side of development only; for embryos have this in common with maps, that too close and too exclusive a study of them is apt to disturb a man's reasoning power."

The ancient Greek philosopher gives us a threefold division of the intellectual faculties,—*φρόνησις, ἐπιστήμη, σύνεσις*—and I think we may apply it to the subdivision of labour in natural science: *φρόνησις, ἢ τὰ καθ' ἕκαστα γνωρίζουσα*, is the power that divides, discerns, distinguishes—i. e., the naturalist; *σύνεσις*, the operation of the closet zoologist, who investigates and experiments; and *ἐπιστήμη*, the faculty of the philosopher, who draws his conclusions from facts and observations.

The older naturalists lost much from lack of the records of previous observations; their difficulties were not ours, but they went to Nature for their teachings rather than to books. Now we find it hard to avoid being smothered with the literature on the subject, and being choked with the dust of libraries. The danger against which Professor Marshall warns the embryologist is not confined to him alone; the observer of facts is equally exposed to it, and he must beware of the danger, else he may

become a mere materialist. The poetic, the imaginative, the emotional, the spiritual, all go to make up the man; and if one of these is missing, he is incomplete.

I cannot but feel that the danger of this concentration upon one side only of nature is painfully illustrated in the life of our great master, Darwin. In his early days he was a lover of literature, he delighted in Shakespeare and other poets; but after years of scientific activity and interest, he found, on taking them up again, that he had not only grown indifferent to them, but that they were even distasteful to him. He had suffered a sort of atrophy on that side of his nature, as the disused pinions of the Kakapo have become powerless—the spiritual, the imaginative, the emotional, we may call it.

The case of Darwin illustrates a law,—a principle we may call it,—namely, that the spiritual faculty lives or dies by exercise of the want of it, even as does the bodily. Yet the atrophy was unconscious. Far was it from Darwin to ignore or depreciate studies not his own. He has shown us this when he prefixed to the title-page of his great work the following extract from Lord Chancellor Bacon: “To conclude, therefore, let no man, out of a weak conceit of sobriety, or an ill-applied moderation, think or maintain that a man can search too far, or be too well studied in the book of God’s word, or in the book of God’s works, divinity or philosophy, but rather let men endeavour an endless progress or proficiencie in both.” In true harmony this with the spirit of the father of natural history, concluding with the words, “O Lord, how manifold are Thy works, in wisdom hast Thou made them all, the earth is full of Thy riches.”

BRITISH ASSOCIATION REPORTS.

FOLLOWING the Presidential Address in the Biological Section—which owing to the regrettable illness of the President, the Rev. Canon Tristram, was read in his absence—several reports of much interest to zoologists were presented.

Marine biological investigations.—Investigations made at the laboratory of the Marine Biological Association at Plymouth

formed the subject of a report presented by the committee on this subject, including contributions from Mr. F. W. Gamble, B.Sc., on "The Turbellaria of Plymouth Sound," by Mr. Edgar J. Allen, B.Sc., on "The Larvæ of Decapod Crustacea," and by Mr. Gregg Wilson, M.A., B.Sc., on "How Fish find Food."

The luminous organs in Cephalopoda.—An interesting paper was read by Mr. W. E. Hoyle, illustrated by means of a number of limelight pictures, describing the luminous organs of certain cephalopods.

The Marine Zoology of the Irish Sea.—Professor W. A. Herdman presented a valuable report, illustrated with maps and diagrams, from a committee appointed to explore the region of the Irish Sea which lies around the Isle of Man. The committee consisted of the late Mr. George Brook, Professor A. C. Haddon, Mr. W. E. Hoyle, Mr. J. C. Thompson, Mr. A. O. Walker, and Professor W. A. Herdman. The greater part of the area has never previously been thoroughly explored, and some parts are still unexamined. It is a very interesting region from the great diversity of shore, depth, and bottom which it presents. The Isle of Man is connected with Lancashire by a broad plateau under 20 fathoms in depth. A considerable portion of the work has been done in the broad southern extension which lies between Liverpool and the Calf of Man, and gives depths of from 20 to 40 fathoms. In the shallower water around the coasts there is great difference in the physical conditions, and in the fauna of different regions: for example, the sandbanks and flat expanses of mud off the Lancashire coast are very different in every way from the more varied ground off the rocky southern shore of the Isle of Man. But even the seemingly uninteresting sandy wastes of Lancashire present many curious facts and problems to the marine biologist. It is found that on the estuarine flats round Hilbre Island, as Lindstrom suspected to be the case on the coast of Gothland some years ago, the very abundant *Hydrobia ulvæ* lays its eggs upon its neighbours' shells, probably as being the largest and most stable objects among the shifting sand-grains around it. This supposed barren region, too, is of great economic importance as a nursery for young food-fishes. Eight expeditions were made between September and June last, and as a result about 1000 species of marine animals were collected and identified. Of these 38 are new to the British

fauna, 223 are new to the particular district, and 17 are new to science.

Seals and Whales.—Mr. W. S. Bruce contributed some notes on Seals and Whales seen during a voyage to the Antarctic regions in the steam-whaler 'Balæna' from Dundee in 1892-93. "After a boisterous passage of over 100 days, the ship encountered the first iceberg on December 16th, 1892, in 59 deg. 40 min. S., 51 deg. 17 min. W. We continued in a more or less southerly course, passing to the east of Clarence Island. Danger Islets were sighted and passed on December 23rd, and on Christmas Eve we were in the position Ross occupied on New Year's Day, 1843. Until the middle of February we remained roughly between 62 deg. S. and 64 deg. 40 min. S. and 52 deg. and 57 deg. W., the western limit being Terre Louis Philippe and Joinville's Land. All the land seen was entirely snow-clad except on the steepest slopes, which were of black, apparently igneous, rocks. At least three kinds of Seals were observed. These were all true Seals; no Fur Seals were seen. They were the Sea-leopard (*Stenorhynchus leptonyx*), Weddell's false Sea-leopard (*Leptonyx Weddellii*), and a creamy-white Seal, probably the Crab-eating Seal (*Lobodon carcinophaga*). There were two others, which were possibly younger forms of Sea-leopard and Crab-eating Seals respectively. The latter, instead of being white, was mottled grey, but similar in form and size to, and often found among, the white Seals. In December all the Seals were in very bad condition, thinly blubbered and grievously scarred; the females as well as the males. There was no marked preponderance in the number of the females. During January their condition improved, and by February they were heavily blubbered, and free from scars. Loving the sun, they lie on the pack-ice all day, digesting their meal of the previous night, which consists of fish or small Crustacea, or both; Penguins also are occasionally their victims, and stones were found in their stomachs. By February the embryo is well developed, gestation probably beginning in December. It is extremely regrettable that it was during this period the indiscriminate slaughter took place, almost all the females towards the end of January and February being with young. All the Seals were found on the pack-ice; the Sea-leopard was on the outer-most streams, and was most frequently to be found singly, though two or three might be on one piece of

ice, but seldom more. Weddell's false Sea-leopard was very rare, only four of them having been seen. The creamy-white Seal and pale mottled grey ones were in greatest abundance: these were found in fours, fives, or even tens—the greatest number seen on one piece was forty-seven. On one occasion some Seals were found on a tilted berg; so high was the ledge above the water-level that a man with difficulty clambered up and secured the prey. This illustrates their great power of jumping from the water on to the ice. They were seen rising about nine feet above water, and cover distances of fully twenty feet in length. No trace was seen of any Whale resembling the Bow-head or Greenland Black Whale (*Balæna mysticetus*), which Ross reported to have seen in very great numbers. There were, however, Humpbacks, Finners, Bottle-noses, and Grampuses.

Protection of Wild Birds' Eggs.—Under the presidency of Prof. Newton, in the absence of Canon Tristram through illness, Dr. C. Vachell presented the report of a Committee on the "Legislative Protection of Wild Birds," which ran as follows:—

Your committee beg leave to report that early in the present session, a Bill to amend the Wild Birds Protection Act, 1880, was brought into the House of Commons by Sir Herbert Maxwell, M.P., and others, and that on April 13th it was ordered by the House to be printed. Thereupon your committee gave this Bill their careful attention, and found that its main clause contained a provision for the protection of wild birds' eggs. In the opinion of your committee, however, this provision was framed on a principle that appears to them to be mistaken, in that it sought to effect the desired object by empowering local authorities to name the species the eggs of which were to be protected, thus requiring in every case of prosecution proof of identity, which in the majority of cases would be difficult, if not impossible, to supply. Nevertheless, the Bill met with favourable acceptance in the House of Commons, and with some very trifling alterations only, and without any discussion of its principle, passed the third reading, and was sent up to the House of Lords on May 2nd. In the House of Lords the chief objection to the Bill, which had already been observed by your committee, was, among others, prominently brought forward by several speeches in a debate on the second reading, June 14th, and accordingly a series of amendments were introduced and carried when the Bill was in Committee, on June 16th. In almost every point these amendments, and especially one that provided that protection should be given to birds which most required it, by empowering local authorities to name areas in which for

a given time the taking of eggs should be wholly prohibited, accorded with the opinion at which your committee had previously arrived. Subsequently the Bill was further amended by the Standing Committee of the House of Lords, and, having been read a third time, was sent back to the House of Commons for its approval of their Lordships' amendments.

These your committee, after duly considering them, had hoped would be at once accepted by the House of Commons; but, on August 21st, on the motion of Sir Herbert Maxwell, it was agreed that consideration of them should be adjourned for three months, and therefore the fate of the Bill remains doubtful.

In view of the uncertainty thus existing your committee would recommend their reappointment on the same terms as before.

Dr. Vachell observed that unfortunately serious differences of opinion existed as to the way in which birds' eggs should be protected. Everybody was agreed it was necessary to extend the protection. It was thought by some that the County Council should be moved to prevent the taking of particular eggs in particular places at particular times of the year. But some ornithologists told them that that was impossible, as many of the eggs were so similar that in a court of law it would be impossible to swear to a particular egg being the egg of a particular species. It had, therefore, been suggested that if a particular species were declining, and were known to frequent a particular place, the County Council should have the matter represented to them, and be called upon to protect that restricted area. The principle was that they should protect areas, and not species.

Professor Newton, who wound up the discussion which followed, alluded to the practical impossibility of ever getting a conviction, owing to the difficulty of distinguishing between the eggs of one species and another.

THE "RUSSET-PATED CHOUGH" OF SHAKESPEARE.

By PROFESSOR NEWTON, M.A., F.R.S.

THE Editor having courteously sent me an early copy of his latest remarks on this subject (*anteà*, p. 332), I think it only fitting to offer a few observations upon them, in support of the adherence I have hitherto given to Mr. E. T. Bennett's explana-

tion of the Shakespearian passage. I quite agree with the Editor as to the need, from his point of view, of establishing the first three positions he takes up. As to the fourth, I think it immaterial and arises from a misconception; but there is a fifth, which is very material and is overlooked by him.

(1). That "Chough," without qualification, was a name used by many writers indiscriminately for "Cornish" Chough and for Daw, no proof is required; but in this particular passage the word is qualified by an epithet. Our business is to know what that epithet means.

(2). I admit that no other instance of "pated" being used by Shakespear can be found, or can be adduced from any other author, so far as I can learn. The word is thus ἀπαξ λεγόμενον, and every scholar knows the difficulties that such words present. In the corrupt condition of all the old editions of the poet's works no one can vouch for the spelling being that of the author; or, if it were, whether it would be any the better for that. People are apt to forget that he lived when there were no settled rules for spelling English, and that he himself, according to the few autographs which have come down to us, had several ways of spelling his own name. We are quite at liberty to read "patted" or "pated" as we think fit, and the fact that the early printers used the latter form is no proof of its being the right one. Indeed, seeing that, as Mr. Harting says, Shakespear brings in the word "pate" fourteen times (and of course about *pate* in the sense of head there is no doubt), that might at once account for the printer using "pated" in this case, for even a printer (with all respect to him) is not wholly free from bias. But there is something more to be said of this *pate*. I write with deference, but I think it was not the custom in Shakespear's time, as it has since become, to coin an adjective in form of a participle from a purely English noun, such as I take *pate* to be, though as Prof. Skeat tells us, it is of French origin. Where is the French *paté* = "headed"? When that is found, and Littré is silent respecting such a word,* it will be conceivable that Shakespear used *pated* = headed. But in the French *patté*, well known in heraldry,† if not in other ways, he had the word at hand.

* Littré says that in old French *patte* was sometimes spelt *pate*.

† It is rather beside the question, but I take leave to remark that a cross *paté* or *pattée* is not quite the same as a Maltese cross.

(3). That "russet" originally meant red or reddish, no one can dispute. That in later times it may mean some other colour is very likely equally beyond contention. The point which, it seems to me, if I may so say, that Mr. Harting has missed is, what did it mean in Shakespear's time. No later writer is here any authority. Mr. Harting shows that Skinner in 1671, more than fifty years after the poet's death, had only one meaning for it—red, or at least reddish. If it can be shown that "russet" meant grey in Shakespear's time, the case will be half established. Failing that, none of the other authors cited help it; indeed, many of them tell against it. The quotation from Mant evidently refers to the rusty tint put on by dead-ripe grass; Gisborne's "russet" fern is the plant turning reddish-brown; Somerville's "russet" is the colour of the Hare's head, which in England is certainly not grey, whatever the Daw's be, and so on of the rest. Milton indeed has his "russet lawns" in contradistinction to "fallows grey."

But now comes the consideration of "russet," not as a colour but as a woven stuff, whether of woollen, cotton, or what, matters not; though no doubt the fabric was originally named from its colour, and when, as certainly happened, the original meaning of the word was changed, and some other dye was used for the cloth, another adjective would naturally be applied to indicate its colour. Thus we have the expressions "grey russet" and "russet grey," meaning grey stuff; but evidence is, as I have said, wanting* to show that this use existed in Shakespear's day. †

(4). Here I would submit that Mr. Harting's interpretation of the passage is at fault. "Many in sort" means many in company—the use of *sort* in this sense is common enough, and instances

* There is the doubtful exception quoted from Turberville, in which there is nothing to show whether "russet pyle" refers to the surface resembling the fabric "russet" and not to the colour. Certainly such Stags' horns as I have seen "in the velvet" cannot strictly be called *grey* in the modern sense.

† We have exactly the converse in *scarlet*, which comes from a Persian word signifying cloth, and because that cloth was of a particular colour, the word came to mean the colour. So with "plaid." Originally a piece of stuff used to wrap round the body, which stuff was woven in a checked pattern (tartan), *plaid* has come to mean anything that shows a pattern with crossing stripes.

are too numerous to cite—"a sort of Mallards" is proverbial and will be sufficient.

(5). But I said I would add a fifth position to Mr. Harting's four, and this seems to me the only one which concerns the ornithologist. I must quote the whole passage:—

". When they him spy,
As wild geese that the creeping fowler eye,
Or russet-pated Choughs, many in sort,
Rising and cawing at the gun's report,
Sever themselves and madly sweep the sky,
So, at his sight, away his fellows fly."

Here we have the fowler creeping on the ground and shooting at a numerous flock of *Corvidæ* as they rise before him, and fly dispersedly in alarm over his head. Which part of each bird is then most visible to him? its nape or its legs? Let any one ask himself whether in these conditions the grey collar of the Daw, seen from beneath and against the sky, would be perceptible, and whether the red feet of the Cornish Chough would not be characteristic if not conspicuous.

SUPPLEMENTARY NOTE.

BY THE EDITOR.

IN my article on this subject in the last number, reference was made (p. 336) to Dr. Johnson's statement that Sir Isaac Newton had employed the term *russet* in the sense of gray, but at the time of writing I was unable to find the particular passage referred to. Thanks to the courtesy of a correspondent, Mr. G. R. Murdoch, of Kendal, I am now enabled to quote it. It occurs in the 'Opticks' (4to, London, 1704; Book II. p. 89), and is as follows:—"This white spot was immediately encompassed with a dark grey or *russet*, and that darkness with the colours of the first iris."

From Sir Isaac Newton's point of view, therefore, a russet-pated Chough might be a grey-headed Jackdaw.

NOTES AND QUERIES.

Death of the Rev. Leonard Blomefield, M.A., F.L.S.—A venerable link with the past generation of naturalists has been severed by the death of the Rev. Leonard Blomefield (formerly Jenyns), which took place at Belmont, Bath, on Sept. 1st, in the ninety-third year of his age. Having led a life of retirement for many years past, it will probably surprise most of our readers to learn that the author of the 'Manual of British Vertebrate Animals,' published so long ago as 1835 (before many of us were born), has only just passed away. In our next number we hope to give some account of his life and labours in the cause of Zoology.

MAMMALIA.

Destruction of Wild Beasts in India.—A resolution by the Chief Commissioner of the Central Provinces in India on various reports relating to the damage caused by wild animals and the extermination of the latter, contains some observations of more than usual interest. Amongst the animals killed in 1892 for which rewards were paid were 274 Tigers, 442 Panthers, 131 Bears, and 85 Wolves. In the past four years over 1000 Tigers, 2000 Panthers, 500 Bears, and 300 Wolves have been destroyed. Last year 317 persons were killed by wild beasts in the provinces, while the number of deaths from snake-bite was 999. The destruction of cattle is astounding, showing an increase of about 1200 over the previous year. Sir Anthony Macdonnell accounts for this by saying that during his recent tour he noticed a great scarcity of deer in the jungle tracts. They are being cleared out by the native huntsman, and the decrease in the natural prey of the Tigers and Panthers is marked by an increased loss of cattle. On the subject of rewards for the destruction of wild animals, the experience of the Central Provinces seems to show that the system of offering special rewards for the destruction of particular animals or classes of animals is a sound and effective one. The resolution mentions instances of this. In July last it was decided to increase the reward from 10 rupees to 50 when it was proved the animal was a man-eater; again, a special reward of 50 rupees was offered for the destruction of a Bear which had been doing much damage in the Balaghat jungles, while 300 rupees was offered for a man-eating Tiger in the Chanda forests. It is said that special rewards offered in March last year for the destruction of Wolves in the Saugor district had the result of reducing the number of deaths attributed to Wolves in that district from eleven to one. The Chief Commissioner also notices the localisation in a few districts of most of the deaths caused by Tigers and Wolves. For instance, out of 98 deaths caused by Tigers in the Central Provinces in 1892, 68 occurred in the adjacent districts of Chanda, Hoshangabad, and Raipur.

BIRDS.

Black Guillemot on the Solway Firth.—My son shot a specimen of the Black Guillemot on the Solway Firth on August 1st. It was in immature plumage, and has been carefully preserved. This is only the second example of this species which I have seen on the Firth during the last seven years. It is a rare bird with us.—J. J. ARMISTEAD (Solway Fishery, Dumfries).

Reported occurrence of the Black Woodpecker in the New Forest.—In answer to your questions, I feel perfectly certain that I saw a pair of Great Black Woodpeckers, *Picus martius*, on a beech at Stony Cross on the afternoon of May 14th, 1889. In my mind's eye I can see them now. Oh, the insult of suggesting that we might have mistaken a pair of Jackdaws for them! You must know that we were brought up in the country, where Woodpeckers abounded, at any rate the Green and the Greater Spotted, and to the Lesser Spotted I was introduced twenty years ago—to a dead specimen, at least, on a keeper's gibbet. But, to return to our friends of Stony Cross, I am bad at calculating distances, but I should say they were not more than twenty yards off. We watched them for some time, and I made a little sketch of them in my book. If only we had a glass, I might have sworn to every feather. I remember how tame they seemed, or at least how oblivious of our presence. . . . I found the date immediately in John's 'British Birds in their Haunts,' but I have also the entry in my journal, "Saw a pair of Black Woodpeckers close to," &c.—MRS. ANDERSON (Lea Hall, Gainsborough).—[Communicated by Rev. J. E. Kelsall.]

Lesser Whitethroat breeding in Carnarvonshire.—On the 27th May last we found a nest of the Lesser Whitethroat, *Sylvia curruca*, containing a single egg, near Abersoch, on Cardigan Bay. It was placed in a gorse-bush, about a foot above a small stream. The nest was neatly built of grass, lined with finer bents and a little horsehair, and was unusually deep for this species. The bird slipped away on our approach, and sneaked through the undergrowth, so that we were not able to see it clearly. Is this not rather far west for the Lesser Whitethroat to breed?—T. A. COWARD (Bowdon).

[Its occurrence in Breconshire in 1886 was noted by Mr. Cambridge Phillips. See 'Zoologist,' 1886, p. 418.—ED.]

Black Tern in Warwickshire.—On August 12th an immature Black Tern had taken up its abode on Powell's Pool, the largest of six pools in Sutton Coldfield Park. It spent most of its time resting upon a stump that projected about a foot out of the water. When upon the wing it frequented that part of the pool nearest the large reed-bed and marsh, and

had little fear of the fishermen immediately below, occasionally being mobbed by a few Swallows, to whom it paid but little heed. On August 20th Mr. Oldham and I spent nearly two hours watching its movements until it took up its usual position for the night on the above-named stump, which stood some hundred yards from the side of the pool. On August 22nd Mr. Oldham paid the pool another visit, and, taking advantage of a pleasure steamer, passed within a few feet of the post on which the bird was resting. Altogether it made a stay of at least eleven days with us.—J. S. ELLIOTT (Dixon's Green, Dudley).

Black Stork in Middlesex.—An adult male Black Stork, *Ciconia nigra*, was shot at Northolt, near Harrow-on-the-Hill, on the 25th July last. It had been seen about for six weeks—so it was said by the man who shot it—and was said to have been killing and eating young chickens. It was very shy, and when approached would fly to the top of a haystack, where it generally roosted, and where it was eventually shot. It showed no traces of captivity, but that, of course, does not prove that it had not escaped from confinement. I enquired of Messrs. Bailey, in Mount Street, but learnt that no such bird had been lost from their aviaries. On examination, it appeared that it was moulting the third and sixth primaries. It measured in length 3 ft. 4½ in.; expanse of wing, 5 ft. 11 in.; wing, 1 ft. 9 in., and is now in the hands of Mr. J. R. Goshawk, of Harrow, for preservation. It is to be regretted that such rare feathered visitors should not be allowed to remain unmolested and receive that encouragement and protection which is afforded to the White Stork in Holland and Germany.—R. MEINERTZHAGEN (Harrow-on-the-Hill).

Lesser Redpoll nesting in Dorsetshire.—It may interest readers to know that a pair of Lesser Redpolls, *Linota rufescens*, have nested in a prune tree in the garden here this year. The young birds are fledged. I have one egg which was left in the nest, and consider it a valuable addition to my collection. Surely its nest in Dorsetshire must be a rare occurrence.—A. J. BENGOUGH (Upton, Poole).

[Mr. Mansel Pleydell, in his 'Birds of Dorsetshire,' states that this bird occasionally breeds in Dorset, and mentions a nest with eggs found at Thorncombe, Blandford.—ED.]

Baillon's Crake in Dorsetshire.—On June 1st a specimen of this rare bird was captured in the stable of Mr. Hardy's builders' yard at Swanage, within a hundred yards of the sea, and was given to me to have preserved. I have received a letter from Mr. Hart, of Christchurch, who has seen the bird, and he authorises me to say that it is undoubtedly Baillon's Crake. The characters which distinguish it from the Little Crake are its smaller size (scarcely seven inches in length), its olive legs and feet, and the white outer web of the first primary. It is somewhat

singular that another rare bird, the Little Bittern (a specimen of which I recorded in 'The Field' as having been taken near here seven years ago), was also captured in a stable or cowshed. This bird (an adult male) is still on view in the town.—JAS. ANDREWS (Swanage).

[The above information is just what was required to settle the question of identification, and we take this opportunity of remarking that it would be well if correspondents, who do not claim to be experts, when reporting the occurrence of a rare species, would state either their authority for the name, or give very briefly the distinguishing characters upon which they rely in their determination of the species.—ED.]

REPTILIA.

Dimensions of the Adder.—On July 14th I killed an Adder, *Pelias berus*, near Ascot, of the following dimensions (are they not exceptionally large?):—Length, $21\frac{3}{4}$ in.; circumference in three places, $2\frac{1}{4}$ in., $2\frac{5}{8}$ in., $2\frac{1}{2}$ in.; head, $\frac{11}{16}$ in. across; sixty-three black diamond marks on back, 148 scales on stomach. It was in the middle of casting its skin, and had got it back from its head. I took all the old skin off, and, as it was not damaged in the slightest by the blow I gave it on the head, it presents a grand appearance in spirits.—G. V. CHARLTON (Somerset House, Ascot).

[The dimensions are above the average, but we have seen one killed in West Sussex that was 2 in. longer.—ED.]

I have one which I killed some years ago in Surrey, and which measured, before being put into spirits, 26 in.; and in the same year, and the same locality, I saw two others killed, both of which were 24 in. in length. These are no doubt exceptionally long, but I fancy are by no means the "longest on record." It would be interesting to know the dimensions of the largest which has hitherto been recorded. I may add that my 26 in. specimen was measured by myself before it was quite dead.—GEO. E. LODGE (5, Verulam Buildings, Gray's Inn).

I have a preserved specimen of the Adder in my collection which measures 28 in. in length and $3\frac{1}{2}$ in. in girth. It is a female, and was killed by my brother near Grantley Hall, the residence of Lord Grantley. A male was killed at the same time, but it was not quite so large, and was so much injured that it was not worth preserving.—JAMES CARTER (Burton House, Masham).

American Fur-Seals: Correction.—On page 360, line 7, the number of skins of Fur-Seals received from America in 1891, according to Mr. Poland, should be 125,731, not 725,731 as printed.

NOTICES OF NEW BOOKS.

The Amphioxus and its Development. By DR. B. HATSCHKEK. Translated and edited by JAMES TUCKEY, M.A. 8vo, pp. 181, plates i—ix. London: Swan Sonnenschein & Co. New York: Macmillan & Co. 1893. (*Introductory Science Text-books*).

THIS work is translated from the German 'Studien ueber Entwicklung des Amphioxus' of Hatschek, published in 1882 in the somewhat inaccessible 'Arbeiten' of the Vienna and Trieste Zoological Institute. Though it professes to be edited as well by the translator, we find no reference in his Preface to the nature of his labours; and in this respect an occasional footnote, giving a scientific term introduced since the appearance of the original edition, seems to be the only editorial work accomplished. The translator writes clear English wherever he has succeeded in fully grasping the meaning of the German; many obscure sentences are generally to be understood by retranslation into the original language: thus "Some control should be had over such observation [of living objects] through investigation of preserved material to be undertaken by day" becomes intelligible when we see that "should" represents *sollte* (= was necessary). But it requires a reference to the original to make sense of the bull in the italicised words of the following passage:—"In this way no ciliated cells are to be seen in the Amphioxus, *nor in the grown animal even during development, but only flagellate cells.*" Mr. Tuckey seems unfamiliar with scientific terminology in English as well as German, and to have been badly helped in this respect by those friends whom he thanks in the Preface. *Fibrillum*, plural *fibrilla*, is neither English nor Latin. *Carmin* is as unknown to the English chemist, as *Beal* is to our literature. Judging from the readiness with which competent scientific men will read a work of this character for review, it would seem an easy matter to retain their services for reading the proof-sheets; and it is not creditable to English publishers that they so frequently allow translations of scientific works to go forth to the world with so many avoidable blemishes. In a

widely circulated book on Fermentation, translated from the French, we are told that French and Germans are satisfied to drink beer made with "inferior yeast";* there is nothing so bad in the present work; and so far Mr. Tuckey is to be congratulated.

The title of this English translation is somewhat misleading; it only contains an account of the breeding habits of *Amphioxus* at Faro, near Messina, and of the development of the fertilised egg as far as the formation of the mouth and first gill-slit. The account given is admirably systematic and clear, and the figures are good and numerous, though in some cases too small to be readily interpreted, for they are reduced to half the diameter of the originals. But to place on the right-hand cover the word "*Amphioxus*" is seriously to mislead the unwary. A good text-book under such a title would give, in a continuous form, the anatomical structure and full development of *Amphioxus*, as completed by Prof. Ray Lankester's researches, and those of his pupils; and this is so great a desideratum that our satisfaction in obtaining this book in English is marred by the fear that it may preclude the appearance of the other.

M. H.

The Great Sea Serpent: an historical and critical treatise. By A. C. OUDEMANS. Royal 8vo, pp. i—xv, 1—592; with 82 Illustrations. Leiden: E. J. Brill. London: Luzac & Co.

THIS voluminous treatise is in many respects disappointing. The subject is a good one, and, with the materials so industriously collected by the author, ought to have furnished something more satisfactory in the way of result. Mr. Oudemans seems to have collected every printed report and story of a Sea Serpent that he could lay his hands upon, good, bad, and indifferent, and arranged them chronologically, from the 'History' of Olaus Magnus, A.D. 1555, down to a Dutch weekly newspaper ('*De Amsterdammer*') of July, 1890. While he was about it, seeking for observations by ancient authors, he might as well have quoted Pliny (Hist. Nat. lib. viii. cap. 14), but he would have done better had he omitted more than half the stories he has reprinted, as being quite

* "Bottom yeast" is the correct expression for "*levûre inférieure*."

unworthy of credence or consideration. To have taken only the most authentic accounts of the appearance of strange marine forms supposed to have been Sea Serpents, to have examined them critically from the zoologist's point of view, and to have compared them one with another, to show their consistencies and inconsistencies, would have been an interesting and useful piece of work, but the remarkable conclusions at which Mr. Oudemans has arrived show that he cannot be regarded as a safe guide, and the reader so far from accepting his conclusions, must be left to form his own opinion of the value of the various accounts presented to him.

Although Mr. Oudemans has never seen a "Sea Serpent" himself, nor examined or dissected any portion of one procured by anybody else, he has no hesitation in evolving an animal from the descriptions which he has collected, and bestowing upon it a scientific name! In Nov., 1881, in the first number of the 'Album der Natur,' treating of the probability of the existence of a Great Sea Serpent, he examined the characters ascribed to it by various writers, and came to the conclusion that it "must be a mammal with four flappers, a long neck, and a long and pointed tail, and that the position of this marine mammal is between Dolphins and Pinnipeds." Accordingly he proposed to name it *Zeuglodon plesiosauroides* (p. 445). After ten years' consideration he is apparently unwilling to abandon his position, and after studying the law of priority, while considering the rules for zoological nomenclature, he has come to the conclusion (p. 546) that the oldest name for the genus is *Megophias*, of Rafinesque, and that the only name to be given to the Sea Serpent is that of *Megophias megophias* (Raf.) Oudemans!

Although we are unable to accept his conclusions, we fully recognise the amount of labour bestowed upon this compilation, which, it must be allowed, is extremely entertaining. A little more care in the revision of the proof-sheets, especially in regard to the spelling of English proper names, would have been well bestowed.

THE ZOOLOGIST.

THIRD SERIES.

VOL. XVII.]

NOVEMBER, 1893.

[No. 203.

A SCHEME FOR MAPPING THE GEOGRAPHICAL DISTRIBUTION OF VERTEBRATE ANIMALS.

By MILLER CHRISTY, F.L.S.

1. *Introductory Remarks.*—The following outline of a scheme for the compilation of a comprehensive work on the Geographical Distribution of Vertebrates, to consist of a coloured map to show the distribution of each species, accompanied by descriptive letter-press, was drawn up by me several years ago, at which time I contemplated commencing a work on the distribution of the vertebrate animals inhabiting the Palæarctic region upon the lines herein suggested. Various causes combined to hinder the actual commencement of the work, and now I regret to find that my leisure promises to prove insufficient to allow of my carrying it out for some time to come. Under these circumstances, as this mere outline of my scheme involved a good deal of thinking out, and as it may contain ideas useful to others (especially to those undertaking monographs of genera or families), I have, with the approval of the Editor, thought well to print it in 'The Zoologist,' though I do not claim for my ideas any great originality.

In brief, my scheme aimed at supplying a map for each species, showing, by means of different colours, in considerable detail, and with the nearest possible approach to accuracy, the following points for each species:—

- (a). Its present (indigenous) area of permanent residence throughout the world;

- (b). Its summer and winter ranges throughout the world (if migratory) ;
- (c). Its relative abundance in different parts of its area ;
- (d). Its lines of migration (if any) ;
- (e). The additional area (if any) over which any species, now partly or wholly extinct, can be traced within historic times ;
- (f). The additional area (if any) over which it has been naturalized by human agency ; and
- (g). Many other points of interest, such as isolated occurrences,* erratic movements,† areas of hybridization,‡ &c., &c.

The interest and value attaching to such a work, if properly carried out, must be at once apparent to any one acquainted with the subject. Geographical Distribution is a key to many very interesting problems in natural science, and a scheme such as this, if perfected, should throw much light on many vexed questions as to the origin of species, and on the value of the distinctions which naturalists have drawn between what we are accustomed to regard as "good" or "bad" species. It should show, to some extent at least, the causes which have separated, or are separating, species, whether those causes of separation are deep seas, mountain ranges, variations of temperature, or other physical facts ; while similar remarks apply to sub-species (those incipient and partially-differentiated species to which "trinomial" names are now applied). The careful mapping-out of the distribution of these latter forms should throw some light on the physical causes which are separating

* I refer here more especially to such isolated and exceptional occurrences as those discussed by Mr. J. J. Dalgleish in his "List of Occurrences of North American Birds in Europe" (Bull. Nutt. Orn. Club, vol. v. 1880, pp. 65—74, 141—150, and 210—221).

† By this term, I mean such movements as those occasionally performed by *Syrnhaptes paradoxus* and *Lemmus norvegicus*, which are not regular or seasonal, and are therefore quite distinct from migration proper.

‡ For instance, of *Corvus cornix* and *C. corone* and of *Lanius excubitor* and *L. major* in Western Siberia ; also of *Colaptes auratus* and *C. mexicanus*, and many other species, in North America. In most cases, areas of hybridization will be found at the dividing line between the breeding grounds of a species and one of its own sub-species ; but this is by no means always the case, as may be seen on reference to Monsieur Suchetet's 'Les Oiseaux hybrides rencontrés a l'état sauvage.'

them from the parent species, and which will in time so differentiate them, by developing their peculiarities, that they may fairly be regarded as distinct species, though opinions will always differ as to the point at which this separation may be considered to have taken place. These and many other interesting points which might be elucidated by the successful carrying out of the following scheme, will readily occur to the reader.

The present is, I think, a very opportune time for undertaking the work, which may be said to have long been "in the air"; yet it may be doubted whether, until the last few years, the information available has been sufficient to admit of its accomplishment with anything like completeness.

It will be obvious that the value of any such scheme as that herein sketched out will depend almost entirely upon its accuracy, and that, as the work progresses towards absolute completeness (though this is, of course, practically unattainable), the value will increase in a still more rapidly increasing ratio; for, in any such scheme, there would be comparatively little value in the details, or in full information from a restricted area, or in the complete mapping of the distribution of a few species only throughout the world; but considerable value would attach to such broad generalizations as might be drawn from the carrying out of a comprehensive scheme of the kind. Thus a series of maps, showing the distribution of all species inhabiting any country having political boundaries (let us take France for example), within that country only, would be so incomplete as to have but little value, except as a small contribution to a vastly larger scheme. Any such work, if undertaken with the idea that it was an end in itself, would merely show the absurdly parochial view which is still so often taken of the study of natural science. If the work were extended so as to show the distribution of French species, not only in France, but throughout the world, it would at once be placed on a more natural and rational basis; but we seem scarcely to reach a stage of even approximate completeness, from a natural point of view, until we have fully mapped out the distribution throughout the world of all the species inhabiting any one of the great natural regions (the Palæarctic, for example) into which naturalists have divided the world. It seems to me that these broad generalizations, on which

(as already stated) almost the whole value of any such scheme would depend, could hardly be drawn from any more restricted plan than this. Hence it was that my original intention was to treat only those species inhabiting the Palæarctic region. The mapping of the distribution of all known species throughout the world is, of course, the ideal scheme to aim at, and the only one which could be regarded as absolutely complete; but this would be such a gigantic task that no one person could be expected to undertake it.

2. *Bibliography*.—The first step necessary is the compilation of a topographical catalogue, or bibliography, of all published sources of information which treat of the geographical distribution of any species in any part of the world. It would be a great convenience, and would save a large amount of space in the body of the work, if the entries in this catalogue (which should ultimately form an Appendix) were numbered consecutively, and if reference were made to the authorities quoted, by giving first the name of the authority, followed by the number appended to his particular work, or article, in the Bibliography, with the number of the volume (if the work consists of more than one) and the page, as is done in my 'Birds of Essex' and many other modern scientific works. Thus:—"It abounds throughout northern Africa during winter (Gurney, 294, ii. 381)."

The compilation of this Bibliography, though nominally the first part of the work to be undertaken, would in reality be largely completed (if not mainly gathered) during the progress of the main portion of the work.

3. *Maps*.—The second step should be the preparation of a suitable uncoloured map of the world on which to indicate the distribution of each species. This should, of course, be on Mercator's projection. A convenient size (at least for working purposes) would be "royal broadside" (20 × 25 inches). This would show the British Islands about 3½ inches in length, which would, I think, be sufficiently large for all practical purposes. The maps used in the completed work, when published, might be much smaller. The map should show the main political divisions, the chief towns and cities, general ocean depths, all the principal rivers and mountain ranges, with perhaps a few other physical details. The political divisions would be found useful when entering the information on the map, as most existing mono-

graphs and local lists of species take note chiefly of political (rather than natural) areas.

Certain special maps, which may be called "Key Maps," would be also necessary, and these are noticed hereafter.

4. *Mapping out the Distribution of Species.*—The exact distribution of any species having been more or less precisely ascertained from published or other sources, and copies of the map of the world being ready, the next matter obviously is to portray the area inhabited by the species in question on one of the maps, in order that its distribution, the world over, and the more important facts connected with, or influencing, its distribution, may be shown cartographically at a glance, as already explained.

Birds, in consequence of their power of migration, will obviously require a much more detailed scheme of mapping, in order adequately to represent the geographical distribution of the various species, than any other division of vertebrate animals will require, except perhaps the Fishes. In no other class of the vertebrate animals do we meet with anything corresponding with migration among birds, in the same sense and to the same extent. In the case of Birds, it is necessary to portray both their summer and winter distribution, as well as the lines of migration in both spring and autumn (often different), and the spots outside the ordinary range of the species at which individuals have occurred as accidental stragglers—a point which (though comparatively trivial when a single or a few species only are under consideration) becomes of some importance in a comprehensive scheme like the present, as indicating former or at present unsuspected lines of migration.

The Geographical Distribution of birds being, therefore, more complicated and more difficult to represent pictorially upon a map than the distribution of any other class of vertebrate animals, the following scheme has been drawn up specially with reference to the class Aves; but it will be found, I believe, that there is no fact in connection with the geographical distribution of either the Mammals or Reptiles (and probably none connected with that of the Fishes) which is not capable of being readily indicated by a partial or simplified use of this scheme.

RULES FOR MAPPING (BIRDS ESPECIALLY).

(a). *Red* indicates the area throughout which the species is a *summer visitor* (i. e. that over which it breeds).

(b). *Blue* indicates the area over which it is a *winter visitor*.

(c). *Purple* (i. e. blue printed over red*) indicates the area over which it is a *permanent resident* (i. e. over which it both breeds and winters). Partial inter-migration of the species within this area might be indicated by lighter shades of colour, though this would be somewhat difficult.

(d). These *colours*, indicating the period of residence over certain areas, should be also used in conjunction with the various other indications of distribution mentioned hereafter (region over which the species has become extinct, or has been naturalized, its line of migration, present evident changing of distribution, probable (but unrecorded) extensions of its area, &c., &c.), as more fully pointed out hereafter.

(e). *The lines of Migration* along which the species passes to or from its summer or winter resorts, as the case may be, should be represented, so far as they are known, by means of arrows indicating the general route and direction of migration. As, in the case of some species, a route is followed in the spring migration which is different from that followed in the autumn migration, *red* arrows would indicate the route by which a species *proceeds* to its summer haunts, while *blue* arrows would indicate that by which it *returns* to its winter resorts. †

(f). *Relative abundance* of the species, or the reverse, may be indicated as follows:—An unbroken patch of colouring would show the area over which a species is fairly or very abundant; the area over which a species is of occasional, though more or less regular, occurrence can be shown by a number of asterisks placed in regular pattern thus:—

```

* * * * *
* * * * *
* * * * *
* * * * *

```

while isolated and altogether exceptional occurrences can be indicated by isolated asterisks (thus *), the date of each occurrence being affixed, if thought desirable. In each case, of course, the colour of the asterisks or other marks used would indicate whether the relative abundance over

* Thus all the facts connected with the distribution of any species as specified herein may be represented by the use of only two colours (of course, excepting black), which will effect a great saving of expense in the ultimate printing of the intended work for publication.

† The "erratic movements" referred to on p. 362, though distinct from true migration, might also, for convenience, be represented by arrows.

certain areas were during the winter or the summer; if during both, asterisks of both colours would, of course, be used. In the case of isolated occurrences of a species beyond its known range, it would sometimes be difficult to decide whether it should be entered as in summer or in winter. The time of year would often be an inefficient guide, so that in each individual case probabilities alone could be relied upon.

(g). *Uncertainty as to the boundaries* of the area occupied by any species, in cases where, although there are no actual records, it probably occurs over a wider district than is proved to be the case, may be indicated by marks of interrogation placed close together, in regular pattern covering the region in question as in the case of the asterisks above mentioned; the colour, of course, indicating whether the species may be expected to inhabit the conjectural area during the summer or the winter. For instance, in the case of two or more adjacent, but disconnected, areas being shown for one species, without there being any apparent cause for, or actual information respecting, its absence in the intervening space or spaces, it is a reasonable conjecture that the species in question really inhabits, but has not been actually recorded for, the intervening region or regions; and the marking above described may well be used to indicate this probability, until actual information is obtained.

(h). The area over which it is known that any species has become extinct through natural causes within historic times, or has been exterminated by human agency, may be readily shown by covering the region with parallel *perpendicular* lines, their colour of course indicating whether the species in question is believed to have been a summer visitor, a winter visitor, or a permanent resident in this region. On the other hand:—

(j). The area over which it is known that any species has been naturalized by human agency, more or less, within historic times may be readily shown by covering the region with parallel *horizontal* lines, their colour, again, of course indicating whether the species in question inhabits the particular region as a summer visitor, a winter visitor, or a permanent resident. In some cases it might be desirable to show the rate at which this naturalization of a species has been extended.* This could easily be done by means of fine lines, like isotherms of temperature, which might each be dated, if desired.

5. *Generic Maps.*—In addition to the maps indicating the geographical distribution of *species*, it is desirable also to have a series of maps showing the geographical distribution of

* Such, for instance, as the spread of *Passer domesticus* over North America, of *Lepus cuniculus* over Australia, and (to select an example from among the plants) of *Elodea canadensis* over Britain.

genera. These generic maps could be easily compiled from the specific maps, when completed. They would probably throw some light on the value of the generic distinctions which have been based mainly on anatomical structure. In the case of these maps, it would be sufficient to indicate by means of one colour the entire area covered by a genus as represented by any of its species, either in summer or winter. The distinction between the haunts of the different species belonging to the genus in question at different times of the year is, for this purpose, of no importance whatever. Similar maps, showing the distribution of families and orders, might also be prepared, and would certainly prove interesting.

6. *Key Maps*.—In addition to the foregoing maps it is desirable (as already stated) to have certain other maps which may be called “Key Maps,” representing the various chief natural forces and physical facts which have any effect on the distribution of animals, or which govern their migrations. They should, in the first instance, be plain uncoloured maps, exactly similar to those used in marking out distribution, but they should be printed on some *transparent* paper, such as tracing-paper. They should ultimately, for use, be coloured by hand, in such a manner that each one shows the existence and influence over the surface of the world of some one physical or natural force. Thus, one key map would indicate the elevation of the surface; another, the prevailing ocean currents; another, ocean depths and ancient coast lines; others, the prevailing wind currents at different times of the year; others, the chief mountain ranges and river systems of the world, rainfall, slope exposure, distribution of forest, hygrometry, geological formations, &c., &c. When so coloured, these maps might be taken in turn and laid over each completed map showing the distribution of any particular species. By this means, a more or less clear idea might be obtained of the effect which the various physical facts and causes shown on the different key maps have had on the distribution of the species in question; for the distribution of the species would be seen through the transparent maps showing the various physical forces, and a careful comparative examination would probably to some extent show the correlation of the two, or, in other words, what effect the latter had upon the former.

THE "RUSSET-PATED CHOUGH" OF SHAKESPEARE.

BY H. A. EVANS.

EVER since I learnt from the late F. A. Marshall's note on this passage, in the 'Henry Irving Shakespeare' (vol. ii. p. 377), that there was authority for interpreting the word *russet* as = *gray*, I had ceased to feel any misgivings about the "russet-pated Chough," believing that the question was thus settled in favour of the Jackdaw. Every other consideration, as I shall attempt to show, is strongly in favour of this identification, and though I do not think that Professor Newton has proved his point in the last number of 'The Zoologist' (p. 368), I admit that he touches the weakest point in his opponent's case when he challenges proof that in Shakespeare's time *gray* was one of the accepted meanings of this word *russet*.

(1). There can be no doubt that the commonest meaning of the word in Elizabethan literature is its etymological one, i. e. *reddish*, or *reddish-brown*; see, for instance, Gerard's use of it—a writer whose special business it was to be exact in his descriptions of colour. But, from the frequent mention of *gray russet*, we may infer that the colour of the coarse woollen cloth, which at least as early as 'Piers the Plowman' ("Thus robed in russett ich romede a-boute," *Passus*, xi. 1) formed the ordinary dress of the peasantry, though possibly sometimes brownish, as the name implies, was as a matter of fact most commonly gray; and I think the Editor has found the key to the difficulty when he suggests (September number, p. 334) "that many probably derived ther sense of the colour termed 'russet' from the material." The word would thus come to be used alone to denote a gray colour, just as we now-a-days may talk of "chocolate cloth," "olive morocco," "orange velvet," instead of "chocolate-brown," "olive-green." If this be so, Shakespeare, in using the term "russet," may habitually have associated it with the *gray* material, rather than that of any another colour. Unfortunately our evidence on this point is of the scantiest: he uses the word only thrice; once of the stuff figuratively—a passage which does not help us, once in the passage under discussion, and once in 'Hamlet' (Act i. sc. 1):—

"But, look, the morn in *russet* mantle clad,
Walks o'er the dew of yon high eastward hill."

This is usually interpreted "rosy," but it is obvious that "gray" is equally appropriate, and indeed Mr. Marshall (v. s. vol. viii. p. 96) says:—"Every one who has kept watch out of doors all through the night knows that grey light which is the first precursor of morning, after which comes, if it comes at all, the red and golden colour"; and he proceeds to quote the lines in 'Much Ado about Nothing' (Act v. sc. 3):—

". The gentle day,
Before the wheels of Phœbus round about
Dapples the drowsy east with spots of gray,"

and the line in 'Romeo and Juliet' (Act iii. sc. 5):—

"I'll say yon gray is not the morning's eye."

Such is the evidence; the reader must draw his own conclusion.

I take the following from Fairholt's 'Costume in England' (ed. 1885, vol. ii. p. 354):—

"*Russet*. Reddish-brown or grey . . . Florio, in voce 'Romagnuolo,' describes [the material] as a kind of coarse homespun 'sheepe's *russet* cloth, called frier's cloth, or shepherd's clothing.' Peacham, speaking of countrymen in 1658, says, 'Most of them wear *russet*, and have their shoes well nailed.' *Gray russet* is mentioned in Delony's 'Pleasant Historie of Thomas of Reading' [1612], as the ordinary garb of country-folks; and when Simon's wife, in this tale, complains that 'the London oyster-wives, and the very kitchcn-stuffe cryers, doe exceed us in their attire,' her husband tells her, 'We are country-folks, and must keepe ourselves in good compasse; *gray russet* and good hempe-spun cloth doth best become us.' In the ballad of a 'Courtier and County Clown,' in Durfey's collection, the latter says:—

'Your clothes are made of silk and sattin,
And ours are made of good sheep's grey.'

'In *homely gray*, instead of bisse [bice] and purest palle,
Now all thy clothing must be.'

Patient Grissel, 1619."

In connexion with his contention that *russet* is equivalent to *gray*, Mr. Marshall, in the note on the present passage above referred to, directs attention to two long notes of his on the subject in 'Notes and Queries' (6th series, vol. ix. pp. 345, 470), to a note by Professor Newton in the same volume (p. 396), and to another by Mr. W. Aldis Wright, withdrawing his adoption of Prof. Newton's view (vol. x. p. 499), and continues, "Of the passages

proving that *russet* = *gray*, it will be sufficient to quote Cotgrave [1611], who gives under '*Gris: gray, light-russet, grizle, ash-coloured, &c.*'

In Mr. Marshall's first communication to 'Notes and Queries' (vol. ix. p. 345), he says:—"That Shakespeare in this passage meant the Jackdaw I think there can be very little doubt. In fact, I doubt very much if the word 'Chough' is ever used by Shakespeare for anything but Jackdaw. Certainly, in the well-known passage in 'Lear,' 'the crows and choughs that wing the midway air' (iv. 6), there is some reason for thinking that Shakespeare meant red-legged crows; for that this bird was found on Dover Cliff at a period later than Shakespeare's time we know on the evidence of Pennant, quoted by Yarrell, who gives Beachy Head and the Isle of Wight as localities. But there is no reason why 'Chough' should not mean 'Jackdaw' even in that passage; for there must have been plenty of Jackdaws on Dover Cliff in the time of Shakespeare, and there might not have been any red-legged crows there at all. Had he applied the epithet 'red-legged' to Choughs in any of the passages in which the word occurs we should have known that he meant the Cornish Chough." After specifying the passages referred to, he concludes:—"I think there can be no reasonable doubt that, in all these passages, by 'Chough' Shakespeare means the Jackdaw, and not the red-legged Crow."

In Mr. Marshall's second communication to 'Notes and Queries' (vol. ix. p. 470), after acknowledging the perusal of Prof. Newton's view (*tom. cit.* p. 396), he remarks:—"With all due respect, I must entirely repudiate such a reading as *russet-patted*. In the first place, there is no such word as *patted*, and I do not believe that Shakespeare would have invented it for this occasion, as it was utterly unnecessary to do so. In the next place, under no possible circumstances could *russet-patted* fairly be held to be a synonym for *red-legged*." He proceeds to give some instances of the use of the word *russet* in the sense of *gray*, amongst others the following:—

"And also glad of a goune of *grey russet*."

Piers Plowman, p. 280 [C. Passus, xvii. 298].

And

"Also aboute thys tyme the gray Fryers were compelled to take their old habit *russet* as the shepe doth dye it."

Fabyan's Chronicle, p. 687.

And he concludes:—"I think these quotations perfectly justify my suggestion that *russet* might apply to the gray colour of the Jackdaw's head; but that it ever could apply to the bright red of the Cornish Chough's legs and feet, they seem to me—if language has any meaning—absolutely to forbid. Finally, let me say that a reconsideration of all the passages in Shakespeare in which *Chough* occurs confirms me in the belief that it never meant anything else but *Jackdaw*. In all the other passages Jackdaw suits the sense much better than the Cornish Chough would."

(2). Both the Editor and Professor Newton write under the impression that the word "pated" occurs in Shakespeare but once, and the latter rests upon this as an argument in favour of the conjecture "patted." I say nothing of the fact that all the six "old editions" agree in reading "pated," but the case is considerably strengthened when we take into account the fact that Shakespeare uses "pated" *five* times in addition to the passage under discussion. These are:—*bald-pated*, 'Measure for Measure,' v. 1; *crooked-pated*, 'As You Like It,' iii. 2; *knotty-pated* and *not-pated*, 'Henry IV.,' Pt. 1, ii. 4; and *periwig-pated*, 'Hamlet,' iii. 2. With regard to another point raised by Professor Newton, I confess that, in the face of such Shakespearian expressions as "hoary-headed," "long-legged," "loose-bodied," "big-bellied," "fat-brained," "lily-livered," &c., I do not understand him when he writes ("with deference," it is true), "it was not the custom in Shakespeare's time, as it has since become, to coin an adjective in form of a participle from a purely English noun."

(3). Even assuming that Shakespeare could have been guilty of such a gallicism as "patted" for "legged" or "footed," there is no proof—is there even any probability?—that, inland-bred as he was, he was familiar enough with the Cornish Chough and its habits to include whole flocks of them ("many in sort") among the quarry pursued by "the creeping fowler." Of the six other passages in the plays in which the word *Chough* occurs, there is only one—the famous description of Dover cliff in 'King Lear'—which raises the slightest presumption that the Cornish Chough is intended, and here we are equally at liberty to adopt Mr. Marshall's view, and understand the birds in question to be Daws, as are most undoubtedly the "Choughs" which may be seen any day "winging the midway air" along the cliffs of Bideford Bay.

"Flocks of wild-geese" were doubtless frequently to be met

with in those days in the undrained marshy tracts throughout the country, and the editor of the fourth edition of Yarrell informs us (vol. ii. p. 252)—though on what grounds is not evident—that the Cornish Chough “apparently frequented a good many inland localities in former times.” It would be interesting to know what evidence there is as to the inland distribution of this species in England.

In reply to Professor Newton’s fifth position (p. 393), no more need be said until his view is established on other grounds; meanwhile we must be content to regard the epithet “russet-pated” as one of those descriptive touches which we find again in the “long-legged spinner,” the “red-hipped humble bee,” and the “shard-borne beetle.”

MEMOIR OF THE REV. LEONARD BLOMEFIELD, M.A., F.L.S.

A VENERABLE link with a past generation of naturalists is severed by the death of the Rev. Leonard Blomefield, better known as Leonard Jenyns, who died at Bath on the 1st September last, at the advanced age of ninety-three. A contemporary and friend of Yarrell, Selby, Dean Buckland, Dr. Gray, Bell, Darwin, Westwood, and other well-known zoologists, a friend also of the Professors of Botany, Daubeny and Henslow (for he was also a botanist of some ability), he lived to see all these pass away, and to become acquainted one by one with the new generation of zoologists springing up around him, many of whom were not born when he wrote and published his ‘Manual of British Vertebrate Animals’ in 1836. He used to say that the earliest occurrence in his life which he could recollect was the funeral of Lord Nelson, which took place in January, 1806, when he was between five and six years old. He remembered coloured pictures of the funeral procession being sold in the streets, and some of them being brought up to the nursery for the edification of the children of whom he was one.

His father was the Rev. George Jenyns, who on the decease of a second cousin, Soame Jenyns, came into possession of some property in Cambridgeshire known as Bottisham Hall. It was here that his early life was spent; although he was born in London, in Pall Mall, at the house of his maternal grandfather,

Dr. Heberden, a well-known physician of the day. His father's London house, however, was in Connaught Place, from whence, in April, 1809, he went to school at Putney, and Connaught Place at this date was the last street in London west of Oxford Street and the Edgware Road—all beyond being open country and green fields!

After the usual preliminary schooling in Latin and Greek at Putney, he proceeded to Eton in 1813, where, having no inclination for games or sports, he spent his play hours in wandering by himself in the green lanes that skirted the "playing fields" looking after stag-beetles, and watching birds. In after life he expressed the conviction that he had derived his taste for Natural History from his uncle, Mr. Chappelow, who was also his godfather, and a good naturalist.

Neither at Eton, nor subsequently at Cambridge, did he manifest much inclination for either classics or mathematics, but being nevertheless of a studious disposition, he took more delight in reading books of travel and natural history, and was naturally much impressed with White's 'Selborne,' which he borrowed from a schoolfellow at Eton, and, fearing that he might never see the book again, actually copied out nearly the whole of it, omitting only a few chapters which were of less interest in a natural-history point of view. This MS. he kept for years, having little idea at that time of becoming the owner of numerous editions of the work, still less of becoming one day the editor of one of them.

Having determined at an early age that his profession was to be the Church, he never altered his mind, and on the very day of his attaining the age of twenty-three, he was ordained to the curacy of Swaffham Bulbeck, in Cambridgeshire, a parish close to his father's property. He began parish work by taking two full services on the Sunday following, and the manner of his induction was somewhat remarkable. The Vicar of the parish, whose curate he was to be, kept a school in the neighbourhood of Wisbeach, and had never been in the parish of Swaffham Bulbeck since the day he read himself in. More oddly still, he gave Mr. Jenyns the appointment without any interview, and the latter never saw him, his own Vicar, till shortly before his death—twenty years afterwards!

The Vicar, however, resigned in five years, and the Bishop of

Ely gave the living to the Curate. Considering himself then a fixture, Mr. Jenyns enlarged the Vicarage house, made a garden, and planted trees and shrubs. From the front windows there was a pretty view of the Bottisham woods and plantations not far off; while the fens out of view, but within a walk, as also Newmarket Heath and the Devil's Ditch afforded rich ground for Natural History pursuits. Here Mr. Jenyns resided for thirty years, and only resigned his living in consequence of his wife's health, which obliged him, acting under the advice of Sir Benjamin Brodie, to move her to the south of England. After eight months spent at Ventnor, in the Isle of Wight, he removed to Bath, where he continued to reside until his death. His first wife, whom he married in 1844, was a niece of Dr. Charles Daubeny, the well-known Oxford Professor of Botany. His second wife, in 1862, was the eldest daughter of the Rev. Robert Hawthorne, for some years curate of Swaffham Prior, the adjoining parish to his own.

While yet quite a young man, reflecting on his father's occupations and pursuits, and having made up his mind to enter the church, there were four things which he determined to have nothing to do with—not so much from their incompatibility with church ministerial work, as from his personal distaste to some of them, and the fear that they might distract his attention too much from parish duties—these were sporting, farming, politics, and magisterial business. Although his father and two brothers were keen sportsmen, having frequent shooting parties during the season at Bottisham, where the game was purposely preserved, he never fired off a gun in his life, not even when desiring to secure some bird for his collection or for identification. These, if wanted, were shot for him by his brother or by the keeper. He was always fond of studying the habits of birds in their proper haunts, and Cambridgeshire being for the most part open country, such species as like shelter naturally flocked to the plantations round his house, where he had ample opportunities of becoming acquainted with their notes, nature of their food, nidification, and so forth. The smaller summer birds of passage came there in numbers, and he thus became familiar with the nests and eggs of all the species that remained to breed.

He formed a collection, also, of insects of all orders which he could find in Cambridgeshire, paying special attention to the *Diptera*, which in those days were much neglected by entomolo-

gists. This collection he subsequently presented to the Museum of the Cambridge Philosophical Society, of which Society, which he joined in 1822, he was one of the most active members. His collection of British Birds' eggs, together with a series of crania of the smaller mammalia, he gave to the Museum at Ipswich. His British Land and Freshwater Shells, of which he had a tolerably complete collection, and his Herbarium he took with him to Bath.

There was one group of shells, the small fresh-water bivalves *Cyclas* and *Pisidium*, to which he paid particular attention. On this group, after long study of their characters and habits, as observed in specimens kept alive in water for many months, thriving and breeding freely, he wrote an excellent monograph, with plates by Sowerby, which was published in the fourth volume of the 'Transactions of the Cambridge Philosophical Society.'

But his two most important works were his 'Manual of British Vertebrate Animals' and his 'Account of the Fishes collected during the Voyage of the 'Beagle.' The former, containing accurate descriptions and measurements of the species included, together with condensed remarks on their habits, forms a good text-book even at the present day, making due allowance for the progress of Zoology during the fifty odd years which have elapsed since its publication. The latter work he was specially invited to undertake by Darwin, who could find no one else willing to attempt it. Regard for his old friend, and the interest he took in all the valuable results of his celebrated voyage, induced him to comply. But the work cost him a good deal of labour, inasmuch as he had no previous acquaintance with exotic species, and had thoroughly to master the first volume (on the structure of Fishes) of Cuvier and Valenciennes' great work, the 'Histoire des Poissons,' before he felt qualified to determine the species collected by Darwin, and describe such as were new.

In 1846 he published an octavo volume entitled 'Observations in Natural History, with an Introduction on Habits of Observing, and a Calendar of Periodic Phenomena in Natural History'; and in 1858 appeared his 'Observations in Meteorology.' In addition to these separately published works, he contributed a number of scientific papers to the 'Transactions' of various Societies, a list of which will be found appended to a pamphlet entitled 'Chapters in my Life' which he printed a few years ago "for private

circulation" amongst his friends. From this *brochure* we have derived much of our information respecting the earlier years of his life. For the last twenty-five years it has been our privilege to know and to correspond with him, having made his acquaintance in 1868, while on a visit to Bath. Our first meeting was in the Library of the Bath Literary Institution, and we well remember being struck with his personal appearance. He was a tall, spare man, clean-shaved, and, even at that date, with white hair, which he wore rather long. His features were pleasing, and his affable manner that of a refined gentleman of the old school. One had not to converse long with him before discovering that, in matters zoological at all events, he was not only communicative but well-informed; and it afterwards became a subject for mutual regret that the distance which separated us precluded our meeting oftener.

As he advanced in years his journeys to London naturally became less frequent, until at length his great age altogether precluded his leaving home. But he was still actively interested in the Bath Natural History and Antiquarian Field Club, which he founded in Feb. 1855, and to whose 'Proceedings' he continued to contribute almost to the last. In Nov. 1891, when in his ninety-second year, he read before this Society a paper entitled "Remarks on the Distribution and Movements of British Animals and Plants in past and present times, as instanced in the Nightingale and some other cases."*

He presented the whole of the scientific portion of his library (1200 vols.) to the Bath Literary Institution, as well as his entire Herbarium of British Plants in forty folio volumes. A special room was designed for their reception, and the so-called "Jenyns Library" is now an important feature of the building.

He assumed the name of Blomefield in 1871, on succeeding to the property of Francis Blomefield, the historian of Norfolk, whose sister had married a great-uncle of his.

He was an *original* member of three Societies, the Zoological (1826), the Entomological (1834), and the Ray Society (1844), and at the date of his death was the oldest Fellow of the Linnean Society, having been elected in 1822, the same year in which he became a member of the Cambridge Philosophical Society. He

* Proc. Bath Nat. Hist. and Antiq. Field Club, vol. vii. pp. 185—199.

joined the British Association in the second year of its existence in 1832, and at its Edinburgh meeting in 1834 read a valuable Report upon the progress of Zoology.

In November, 1892, the Council of the Linnean Society, recognizing the fact that Mr. Blomefield had been a Fellow of the Society for seventy years, caused an Address to be drawn up and illuminated on vellum, which was numerously signed, and forwarded by the Librarian for Mr. Blomefield's acceptance. It was worded as follows:—

“*To the Rev. LEONARD BLOMEFIELD, of Belmont, Bath, M.A., F.L.S.*

We the undersigned Fellows of the Linnean Society of London, on the 17th day of November, 1892, in General Meeting assembled, desire to congratulate you, as “The Father of the Society,” on the occasion of your attaining the seventieth anniversary of your election, an event unprecedented in the annals of this or perhaps of any other Society. We desire to record our gratification on learning that, at the advanced age of ninety-two years, you still retain a vivid interest in that branch of science of which during an exceptionally long career, both by precept and example, you have been so able an exponent, and we cordially express the hope that so worthy a life may be long spared.”

Here followed a long list of signatures of those who were present at the meeting, supplemented by the signatures of several others who had been unable to attend.

Mr. Blomefield's reply, addressed to the Librarian, was as follows:—

“Belmont, Bath,

Nov. 22, 1892.

“MY DEAR Mr. HARTING,

Thank you very much for your letter received on Saturday, and yet more for the very valuable congratulatory address from the Members of the Linnean Society generally, which came safe to hand yesterday evening. In respect to this last, I hardly know in what terms to make any adequate reply, or therein to express what I feel in the way of gratitude and thankfulness for so high a mark of esteem on the part of the Society, with which I have had so little intercourse for a long time back.

“True it is that my connexion with the Society, so far as membership goes, has now lasted for the long term of seventy years, longer perhaps than in the case of any other member; but it grieves me to think how little I have done personally for the interests of the Society, how trifling the contributions I have formerly made to its publications. When I open and

inspect the Journals which it puts forth from time to time (still so liberally sent to me as they appear), and see the valuable work being done by others, often most elaborate researches into the minute structure of the lower forms of animal and vegetable life, my own doings in Zoology and Botany, fond as I am of the subject even now in extreme old age, seem as nothing.

“Yet the retrospect is not without other reminiscences of a more pleasurable character. It brings back to my recollection departed friends whose names may be found in the older lists of the Society, with some of whom I joined in the pursuits that gave us so much pleasure, but who have long since been called to their rest. I as yet remain; if I cannot claim acquaintance with many of the Fellows of the present day, I shall always hold in grateful remembrance those who were instrumental in getting up the Congratulatory Address just received, which shall always have a place on the walls of my study, whereon there are several portraits of old Linnean Society members, including that of Mr. Macleay (the father of Alexander Macleay), who was, if I remember right, Secretary to the Society on the evening on which I was admitted, Mr. Lambert, V.P., being in the Chair.

“Once more expressing my gratitude for the great honour that has been done me,

Believe me, dear Mr. Harting,

Sincerely yours,

LEONARD BLOMEFIELD.”

This was the last letter received; and, having regard to its length and to the firm character of the handwriting, it is a remarkable one for a writer then in his ninety-third year. In less than twelve months from the date of it, he was called to his rest; but he has left behind him an imperishable name in the annals of English Zoology.

His life furnishes an excellent example of the good that may be done by a country vicar by encouraging those about him to use their powers of observation, and find a pleasure in contemplating and studying the various forms of animal and plant life by which they may happen to be surrounded. The books and papers which he published, the lectures which he delivered, the Field Club which he founded, all tended in this direction—the encouragement of the study of Natural History—and when we consider the number of years over which his labours extended, it must be admitted that in this particular line he has rendered considerable service to science,

An observation of his own is worth repeating here, as a piece of good advice to young naturalists, and as a fitting conclusion to this imperfect memoir. In 1889 he wrote:—" Darwin once, in a letter to me, expressed his surprise that with all my parish work and church duties to attend to, I was able to do so much in Natural History. The secret of the matter lay simply in a well-considered arrangement of time and occupations. I was always an early riser, seldom, unless indisposed by illness, getting up later than six o'clock till past four score years. I had also contracted a habit of turning all leisure hours and half-hours to good account and (what I consider of much importance in all work requiring time and thought), never attempting two things at once, but for so long as circumstances allowed, throwing my whole mind into whatever I was engaged upon as if there was nothing else to attend to; in accordance with the scriptural maxim—' Whatever thy hand findeth to do, do it with all thy might.' "

ON THE DISTRIBUTION AND HABITS OF THE PIED FLYCATCHER IN WALES.

By E. A. SWAINSON.

HAVING lived for ten years in the midst of one of the chief Welsh haunts of the Pied Flycatcher (*Muscicapa atricapilla*), it has occurred to me that so far as Wales is concerned, this bird has been rather overlooked in works on British ornithology, and that more details on the subject would be of interest. Most of the books describe it as occurring in a few places in North Wales, while Central Wales, where it is probably as common as in any part of the kingdom, is but briefly alluded to. In reply to a request for information, which the editor of 'The Field' was kind enough to publish for me, I received letters from several observers, bringing to light some fresh localities where this bird passes the summer, or has accidentally occurred; and I am now able to add two more counties—Cardigan and Montgomery—to the six from which it had been before recorded. I propose to bring together the notes kindly sent me by correspondents, and to make a summary of the already published matter on the subject, also to add some of my own notes on its habits in Breconshire.

The home of the Pied Flycatcher in Wales appears to be the long mountainous tract reaching from Snowdon to the Brecon Beacons; but even here it is local, and only plentiful in the high-lying valleys at an elevation of from four hundred to a thousand feet above sea-level. It has a liking for the proximity of a fast-running, rocky stream, and the presence of old trees, especially oaks on account of the nesting sites they afford by reason of their holes and fissures, is a desideratum. These conditions are found here and there, but generally in remote, unfrequented districts. In such localities in Breconshire a diligent search will often reveal the presence of this bird, and it is probable that it spends the summer in many places in Central Wales unnoticed. Its migratory instinct is peculiar, and for some hidden reason it presses on to the mountain-side valleys to find a summer home, disregarding during its long flight other apparently suitable spots. A correspondent, in sending me some notes about its habits in the Elan valley, Radnorshire, writes as follows:—"To me it has always been a wonder how these migrants ever reach localities such as I have described. This valley, for instance, is practically surrounded by mountains of extensive moorland; not that this fact would present any difficulty to them in itself, but whence do they gain the knowledge that there are isolated spots suitable to their requirements?"

I propose here to deal with the eight counties from which this bird has been reported, commencing with the north.

DENBIGHSHIRE.—A pair nested at Hendre House in 1843-4 (*Annals and Mag. Nat. History*, 1845). The fact of its nesting in the county was also recorded in 'The Field' in 1871.

MERIONETHSHIRE.—In 1872, and in previous years, it nested at Llandderfel (Harting's 'Our Summer Migrants'). Mr. F. H. Birley, in 1885, found it by no means rare about two miles south of Cader Idris, and discovered six of its nests ('The Zoologist,' 1886, p. 75). Mr. A. B. Priestley, writing from Cae Ddafydd, in the north-west of the county, informs me that "Pied Flycatchers are quite common here now; in saying this I mean that they are of more or less recent introduction to one's notice here. I question if I saw many of them much before 1870; after that date they have become commoner every year I think, and we have now annually considerable numbers of them in the breeding season." Mr. F. C. Rawlings, of Barmouth, has informed me

that it is tolerably plentiful in certain localities in his neighbourhood, and that several nests have been found.

MONTGOMERYSHIRE.—Mr. C. H. L. Ewen writes to say that in 1888 or '89 he found two of its nests, in holes of trees,—one in a birch and the other in an oak—close to the river Cowny, about one mile and a half south of Lake Vyrnwy; and that he saw at least three pairs of these birds, which he generally discovered by hearing their song. A friend of Mr. Ewen's, who was with him when the nests were found, writes to say that each contained six eggs, and that he has often seen this bird in the county. A letter in 'The Field' of Oct. 15th, 1892, from Mr. Alfred George, states that he has twice noted it near Meifod in twenty-six years, and that on one occasion the nest was found.

CARDIGANSHIRE,—Capt. G. Weir Cosens, Bronpadarn, near Aberystwith, writes to me as follows:—"A Pied Flycatcher was shot in my garden at Cwm, about two miles from Aberystwith, by my gardener, in June, 1877, and was brought to me a few minutes after, when I stuffed it, and it is now in my collection; it was a male and in perfect plumage." He adds that he has never heard of any other instance of its occurrence in the county.

RADNORSHIRE.—Mr. C. Bingham Newland, Killetra, Mallow, informs me by letter that:—"The Pied Flycatcher is not uncommon in the woods, and on the banks of the rivers Elan and Claerven, in the neighbourhood of Nantgwyllt, five miles from Rhayader. In these woods there are a great number of very old pollard oak trees, hollow and full of holes, in which I have found the nest of this bird; and I am strongly of opinion that it is these trees that attract it to this locality, for the purpose of nidification. The male appears to arrive very early in the season, before the leaf is on, and the female later." I have also heard from a bird observer, who formerly lived at Nantgwyllt, that it is rather common there, and that several nests have been found. Under the heading, "The Birds of a Welsh County," a writer in 'Temple Bar,' in the year 1887, states that it is a summer visitant to the west side of the range of hills named Radnor Forest.

BRECONSHIRE.—In this county the chief haunt of the Pied Flycatcher is the district included in the basin of the river Usk, where it is fairly common. This river, with most of its tributaries, is in many parts fringed with old trees, which are an

attraction to this bird, on account of the nesting sites they afford. It occurs, at the rate of one or two pairs to the mile, along the Usk, from Lanthetty to Pant-ys-gallog bridge, a distance of about twenty miles. It is still more frequent on several of the streams running into the main river, such as the Honddhu, Yskir, and Bran, which are much wooded and well suited to its habits. It is also not uncommon in the following woods:—In Fenni Vach, a well-timbered, hilly tract of over a hundred acres, it is found to the extent of about nine or ten pairs. It occurs every year in the Priory Grove, adjoining Brecon; also in the west of the county, in a certain hill-side wood, remarkable as being one of the few remaining Welsh nesting-places of the Kite. No doubt the Pied Flycatcher also occurs in other places in the large woods in the wilder districts. A pair or two generally settle down close to Brecon. In 1889 I several times saw a male bird about the fine trees in the "Captain's Walk," a promenade skirting the town; and a pair come most summers, to a grove of old oaks near my house, and have nested there at least twice.

They arrive in this district about the fourth week in April. Certain spots, well known to trout anglers, are then sure "finds" for this bird. Among these are Dinas Corner, Aberyiskir rapids, and the stretch of water above Cwm Ysk. Here, and in other similar spots, the trout-fisher, with an ear for bird music, is pretty sure to recognise the lively song of this little migrant, and perhaps get a glimpse of its striking black-and-white plumage. The song resembles that of the Redstart in duration and frequency of utterance, but it is shriller, and not so loud, and in pitch is nearer to that of the Hedgesparrow. The first three or four notes remind me rather of the spring song of the Coal Tit. I have made several attempts to write it down, and find it varies from time to time. The passages which occur oftenest are:—"Tichee tichee chuck chuck chee," and "Cheety cheety cheety chee."

It nests in holes in trees, generally in oaks, at a height of from ten to twenty feet from the ground. Holes bored by the Great Spotted Woodpecker and Nuthatch are often selected, as well as those formed by decay. Such cavities abound in the well-wooded Usk valley; but other species which nest in holes have also to be provided for, and no doubt the competition for

nesting sites is keen. The nest is easily found by watching the birds, but the eggs are difficult to obtain, owing to the hardness of the wood, and the difficulty in reaching the site. Out of over a dozen nests I have found, I have only been able to obtain eggs from four. Two nests which I took are composed chiefly of honeysuckle bark strips and dead oak leaves. I have examined eggs from five nests, and believe the only ones with which they are likely to be confused are those of the Redstart. On comparing a series of eggs of these two species, I find those of the Redstart are larger, of a deeper blue-green, more glossy and more pear-shaped; those of the Pied Flycatcher being much paler, almost an oval in shape, and with little or no gloss. Eggs from one clutch of seven are very small, and less in size than those of a Wood-warbler. Mr. E. Cambridge Phillips, in his "Birds of Breconshire" ('The Zoologist,' 1881, p. 409), writes:—"This county seems to be a favourite resort of this bird, and I may say with truth that it is fairly plentiful. It has bred in my garden at Vennyvach, and it nests also in several places in and near this town. Ornithologists residing here (and they are very few) agree with me that it is far from rare; and therefore I can only arrive at the pleasant conclusion that, although elsewhere generally considered a scarce bird, this county seems exceptionally favoured." Mr. Alfred Crawshay, writing to me, says that he sees the Pied Flycatcher every spring, about the banks of the Usk near Buckland: that it seems to be fond of alder trees; and one year he noticed a pair of these birds going to feed their young in a nest placed in a hole of a decayed tree.

PEMBROKESHIRE. — Mr. Thomas Dix writes:—"Pied Flycatcher.—Specimens in the collection at Stackpole Court (Mr. Tracey tells me), were killed in the neighbourhood; also that the bird is occasionally seen in the spring and autumn." ('The Zoologist,' 1869. p. 1671).

GLAMORGANSHIRE.—Mr. Digby S. W. Nicholl, writing from The Ham, Cowbridge, says:—"On May 8th, in the grounds adjoining this house, I obtained a male specimen of the Pied Flycatcher. This is, to my knowledge, the only authentic occurrence of this flycatcher in Glamorgan." ('The Zoologist,' 1888, p. 229).

NOTES AND QUERIES.

MAMMALIA.

A Hare with one Ear.—There has just been given to me a very curious Hare, which differs from other Hares in having only one ear. The most careful search failed to discover any traces that there had ever been more than one ear. The place where it ought to have been was perfectly furred over, and although under the skin there was the usual opening in the bone of the skull, no trace of cartilage was to be found there. The animal must have been born with one ear only, or if with both the missing organ must have disappeared at a very early stage in the creature's growth.—ROBERT SERVICE (Maxwelltown, Dumfries).

White Moles.—White Moles are pretty often heard about, but as yet I have not seen one. All the so-called "white" Moles I have met with are really of varying shades of fawn, or pale cream, or buff, sometimes with more or less of a rusty red on snout, and under the breast and throat. I have just seen one of the usual pale yellow, or buff, colour with rusty red spots on nose and along the middle line of the abdomen, which was captured in Rerwick by Mr. John Johnstone, who follows his occupation of mole-catcher there. The specimen is intended for the Observatory Museum collection, and was sent to Mr. Truckell, to whom I am indebted for allowing me to examine it while in the flesh, and also for permitting me to make the following extracts from the letter with which Mr. Johnstone accompanied his present :—"I have never got any pure white Moles—they are all cream, some lighter than others. My father got one on Lochside of Lochrutton about twenty years ago, and he used to remark that it was strange none had been got on that farm since either he or my uncle—I forget which—had got some six of these white Moles about thirty years previously. I got one on Lochside about fifteen years ago, and since then I took two others in that neighbourhood; and I got three, five or six years ago, on Torrs of Auchencairn; and on the farm of Airds on Balcary estate I have taken some ten or twelve in eighteen years, some years two or three, and other years none. I believe there are several farms in Holywood where cream-coloured Moles are got, but I have never wrought there. As regards other varieties than the cream-coloured ones,—I may say that in the cream-coloured Moles the female is always lighter than the male,—I get one or two occasionally on Barcheskie and neighbouring farms with about the size of a sixpence or less of cream-colour on the belly, and a slight tip of the same on the tail. There are some that have the under fur much lighter than the top fur, but my experience is that they are only got in certain

localities like the others—namely, Porterbelly in Kirkgunzeon, and Castlecreavie in Rerwick. The last one of this sort that I got was on Burnside of Mable." Mr. Johnstone's experience appears to indicate that in certain places these curious varieties may be regularly met with. The district round about Thornhill seems to be quite prolific, for the late Dr. Grierson had over a dozen of them.—ROBERT SERVICE (Maxwelltown, Dumfries).

Albino Squirrel.—It may be worth recording that I received, for preservation, on Sept. 19th, an albino male Squirrel with pink eyes. It was shot on Captain Holford's estate, Westonbirt, near Tetbury, on Sept. 11th. It is not for sale.—H. W. MARSDEN (Bath).

[Albino Squirrels are by no means common. One was killed at Holt, Norfolk, in November, 1885, as noticed in 'The Field' of Dec. 12th in that year. Another was caught by a retriever in a plantation at Gumley, near Market Harborough, as recorded by the Rev. A. Matthews (Zool. 1892, p. 20).—ED.]

Decadence of the Vole Plague in Scotland.—As time goes on, the signs that Voles are being at last reduced to their normal number become increasingly evident. The finest grazing ever produced on the sheep farms in the south of Scotland is on the tracts which were devastated by the Voles. This fact is rather remarkable in view of the statements circulated by the alarmed farmers during the height of the plague. What has regularly happened elsewhere on the cessation of these plagues has now come to pass in the sheep-farm districts above referred to. The birds of prey are starving, and in the case of the Short-eared Owls in particular, dead ones are being found lying about in many places. Mr. McKay, our local birdstuffer, received over a dozen in one week. Some that I found were thoroughly examined, and I failed to see anything but starvation and consequent emaciation to account for death.—ROBERT SERVICE (Maxwelltown, Dumfries).

Whiskered Bat in Scotland.—Writing in the 'Annals of Scottish Natural History' for July last (p. 146), Mr. William Evans reports the capture, on the 20th March last, of an example of *Vespertilio mystacinus* in East Lothian, "on the links about a mile east of Dunbar." It is an interesting addition to the list of Mammalia for the Forth district, and is only the second instance in which this species of bat has been ascertained to have occurred in Scotland. The first recorded specimen, which is preserved in Owen's College, Manchester, was captured about five miles from Rannoch, on the Pitlochry road, so long ago as 1874, and is noticed by Mr. Evans in his 'Mammalian Fauna of the Edinburgh District,' p. 23 (1892).—ED.

Hairy-armed Bat in Co. Dublin.—While shooting in the vicinity of Buckley's Hill, near Carrickmines, I observed a few large bats flying

about some trees early in the evening, and procured one specimen. It proved to be the Hairy-armed Bat, *Vesperugo leisleri*, and as it is a rare species in the British Islands, the locality is worth noting.—EDWARD C. BARRINGTON (Dublin).

BIRDS.

The "Russet-pated Chough" of Shakespeare.—May I be allowed to call attention to the word "russet" as applied to one of the oldest varieties of apple. In Miller's 'Gardener's Dictionary' (8vo edit. 1768), occurs the following:—"The Royal Russet, by some called the 'Leather-coat Russet,' on account of the deep *russet* colour of the skin," &c. Now this was a variety in Shakespeare's time, and he well knew it, for in the second part of 'King Henry IV.' Davy says, entering, "There is a dish of 'leather-coats' for you"; and Hazlitt, in his edition of Shakespeare, has the note referring to the word "leather-coat," *russetines*. Now, as everyone knows, the colour of the russet pippin is a rusty red on one side, the inference is plain that this was the colour meant by Shakespeare in the above passage, and cannot possibly mean any other colour. The term grey-russet or russet-grey, as applied to cloth, is the colour of the ordinary Welsh cloth worn by the small Welsh farmers and peasantry at the present day, and has been so worn for centuries. It exactly expresses what it is, *viz.* a rusty-brown colour streaked or rather "shot" with grey, and at a distance looks a reddish brown, the grey being only discernible when quite near. The "russet pyle," as applied to a stag, clearly means its reddish coat, as in a "pile" carpet, which is a thick-coated carpet. I think, therefore, that from Shakespeare knowing the russet pippin or "leather-coat" as well as he did, he alluded to the red feet of the Chough in the above quotation.—E. CAMBRIDGE PHILLIPS (Brecon, S. Wales).

[The expression "russet pyle" evidently does not apply to the deer's coat, for Turberville, who makes use of it, is describing the antlers. We have never seen a russet apple with any red on it.—ED.]

The "Russet-pated Chough."—Beyond reasonable doubt Shakespeare by this term intended the Jackdaw, and I may add—what none of your correspondents have pointed out—that in his day the very old and fine English keeping apples went by the name of *russets* from their colour, and they have no trace of red about them. As for Prof. Newton's suggestion that the red feet of the Cornish Chough, seen from beneath and against the sky, would be perceptible, I would ask who ever saw the legs and feet of a Jackdaw or Chough when flying, or indeed those of any other bird, except Storks or Herons. When a trained hawk is on the wing you may see the "jesses," but not the feet.—C. H. FISHER (The Castle, Stroud, Gloucestershire).

Birds of Prey in the New Forest.—In June last, during one of the many bright days we experienced, I saw a large hawk, at an immense height, wheeling in circles over a wood. I was inclined to believe it was a Honey Buzzard—a species I have seen here years ago—but in this case the bird was too far away to be certain about the species, and considering the scarcity of this bird, it is more likely to have been a Common Buzzard. In June also I saw a male Peregrine Falcon, which had been killed in the act of stooping at a Wood Pigeon; whilst a pair of Hen Harriers—the male in immature plumage, but of full size—and a Hobby were unfortunately killed in the same month. It is, however, gratifying to know that a pair of Hobbies nested—and I trust reared a brood—not many miles from Ringwood; but I am sorry to say one of the old birds was killed in August, after frequenting the same wood with its mate since the beginning of May. I saw a male Montagu's Harrier in the forest, and a keeper told me that a pair had a nest some two miles away—he believed the only pair in that district—but that orders for their protection had been issued, which I was glad to hear. I have since heard that the male was killed outside the forest boundary, but that the female successfully reared a brood. I also heard that no less than three pairs of Marsh Harriers had nested in the forest during the summer, though I know not in what particular locality. At the end of August two small hawks were seen flying about a large field for several consecutive days, apparently preying upon the Sky Larks, which abounded. Unfortunately, the gamekeeper was informed of it, and on the 4th of September he shot one of them, which proved to be a male Merlin, a splendid little bird. The man told me he had seen another, rather larger and not so blue in colour, which I supposed—no doubt correctly—was the female, but fortunately he could neither shoot nor trap it, although he keenly watched and waited for it. It does seem sad that the majority of notes on hawks and owls are the oft-repeated records of their destruction, and it is no wonder, therefore, that many species become rarer every year.—G. B. CORBIN (Ringwood, Hants).

Red-necked Phalarope in Anglesea.—I send you a little bird which was shot here yesterday (Oct. 5th), and which I take to be a Phalarope of some kind. It must be of rare occurrence, or we should see more of them at the period of their migration. Although resident here for some years, I do not remember to have seen another like it.—W. M. WILKINSON (Cymyran, Valley, Anglesea).

[The bird sent is the Red-necked Phalarope, *Phalaropus hyperboreus*, in winter plumage.—ED.]

Purple Gallinule in Suffolk.—While in Bury the other day I was asked to look at a "Blue Coot," which turned out, as I expected, to be one of the large Gallinules, whether *Porphyrio caruleus* or *P. smaragdnotus*

I cannot say, but I think the latter. It was shot in a garden at Horringer, near Bury, on January 10th, 1892, and brought to a publican, who set it up very fairly and put it in a case. The legs had been painted bright sealing-wax red, with a greenish "garter," which he assured me was the right colouring. Whether the Norfolk examples of *Porphyrio smaragdonotus*, obtained in August, September, and October are genuine migrants or not this specimen, shot in mid-winter and in very cold weather, is doubtless an escaped bird, and possibly some one reading this note may remember losing a bird of this kind about the date mentioned, and may be interested to know, its fate.—JULIAN G. TUCK (Tostock Rectory, Bury St. Edmunds).

Sabine's Gull in Cumberland.—Considering that Sabine's Gull has occurred a good many times on the S.W. coast of England, as also on the Welsh coast and on the N.W. coast of Scotland, I have long been puzzled to understand why it has never been hitherto met with in the N.W. of England, notwithstanding the careful description of the bird that I have placed in the hands of persons living on our coast. We have waited long for this little Arctic Gull to arrive, but not in vain. On the 30th of September last an immature female of this species was brought to me for identification by a lad who had shot it on Rockliffe Marsh, Cumberland. Whether the bird had wandered up the Solway Firth from the Irish Sea, or whether it had travelled to this estuary by the great fly-line from the coast of Northumberland, is of course difficult to decide. I lost no time in sending notices of its capture all round the N.W. coast; so that if any other specimens are secured, or even seen, we are sure to hear of them in due course. The bird in question was alone when shot; indeed it might have escaped notice altogether, had it not flown directly over the head of the gunner, who thought that it must be some kind of Tern. It will be placed (in a few months' time) in the new collection which is being cased by the Carlisle Corporation, and which will consist mainly of the collections of the late Mr. J. W. Harris and the present writer.—H. A. MACPHERSON (Carlisle).

Fulmar breeding in Shetland.—Hitherto the only nesting haunt of this bird in Shetland has been supposed to be Foula, but Mr. Trail, of Edinburgh, has ascertained that last year (1892) thirty pairs had nests on the south-westerly face of the Horn of Papa Stour. This interesting fact is announced in a recent number of the 'Annals of Scottish Natural History' (p. 184).

Tufted Duck breeding in Warwickshire.—I have never seen any recorded instance of the Tufted Duck, *Fuligula cristata*, breeding in Warwickshire; but I feel satisfied that such is occasionally the case, at any rate in North Warwickshire. On June 29th last, while watching a family party of Great Crested Grebes on a pool not very far from Coventry, my

attention was called to a very dark coloured waterfowl with a white bar on the wings, accompanied by a brood of young ones. It was obvious at first sight that the old bird was neither a Coot nor a Waterhen, and for some time I was rather puzzled as to what it could be. However, after waiting patiently for a short time, I saw the bird rise up on the water several times and flap its wings in true duck-fashion. Then the white bar became much more apparent, and the white under parts were more plainly seen. From enquiries I have made, I find that "small black ducks" have frequently been seen on the pool in question, and this supports my case. Seeing that this duck is, I believe, a permanent resident in Nottinghamshire, there is nothing very surprising to find it breeding in Warwickshire, but the circumstance may be thought sufficiently interesting to be worth noticing in 'The Zoologist.' I have been informed that Tufted Ducks have for several years past bred at Ellerton, near Newport, Salop.—A. H. ETCHES (Birmingham).

The Coot on the Hampshire Avon.—For some years past the Coot has become gradually scarcer at Ringwood and further up the river, and this not only upon waters where "pot-hunting" sportsmen are allowed to shoot, but also upon that portion of the stream which for miles is strictly preserved. I am informed, on good authority, that numbers of these birds still frequent the river lower down towards the sea, and I well recollect the time when they might almost have been reckoned "by the acre." But during the past summer scarcely a bird was seen or heard,—they generally make themselves known at the time of their clamorous courtship,—and I may safely say not a nest was built where a few years ago they were abundant. I believe the same thing has occurred at Fordingbridge and farther up the river, but I cannot conjecture why all the birds have deserted their old haunts, for although the numbers may have been augmented in the winter by arrivals from the north, yet the Coot was as truly a "resident" as its companion the Moorhen. Their disappearance has been attributed by some to illegal shooting during the "close time"; but I cannot think this illegality is carried on to such an extent as to drive away any particular species, and even if the law-breaking gunner is held responsible for its annihilation on public waters, what can be said with regard to the miles of stream that are strictly preserved, and where a shot is not fired from March until August? for the birds have disappeared from the latter as much as from the former, and if the Coots have gone from that cause alone, why not the Moorhens, Wild Ducks, and other resident species with them? In a former note I have referred to the comparative scarcity of the Pochard upon the same waters in the winter, for at the present time not one is met with where previously dozens were killed. I am well aware that some proprietors on the river are exceedingly well pleased that the Coot has thus disappeared from the upper portions of the river, for it has the

reputation of doing much harm by destroying ova and fry of all kinds of fish. My experience, however, points to the fact that fish in any stage is *not* an exclusive diet or staple article of food, and if more attention was paid to, and accurate observation made of, our feathered friends, we should find a much less number of enemies amongst their ranks than is generally supposed. Aquatic insects and plants are much oftener found in the stomach of this species than any fish remains, and even if an occasional fish is indulged in, surely it need not be grudged from the abundance at hand. I very much hope these birds will return again to their old haunts, and with their summer note of "krew—krew," build their nests and rear their broods. If not, the bird-lover as he wanders along the banks of the old Avon, will have lost one source of pleasure in the absence of the comparatively shy and retiring, but nevertheless active and vigilant Coot.—G. B. CORBIN (Ringwood, Hants).

Goldfinches breeding in Captivity.—The opinions generally expressed on this subject are so conflicting, and in the main adverse to a satisfactory result, that my experience may have some interest to those who study such matters. Mr. A. H. Greene says, "The males might pair with Canaries and produce mules, but the females are not at all likely to breed in captivity." Dr. Karl Russ, in his list of birds which will breed in captivity, omits the Goldfinch, as though it were quite out of the question. In spite of these difficulties, I determined to make the experiment. In 1891 I attempted to get my birds to pair, but they did not even build a nest. I tried again this year, and this is how I managed:—I put a Russian male and a German female Goldfinch, which I had had about two years, about the end of May, in a London breeding-cage, and placed them in a quiet room. The hen laid her first egg on the 1st of June, and laid one every day afterwards until the full number (five) was deposited. She sat on them for fifteen days, but without result. At the end of about a week she again commenced laying, missed a day, and then continued until five were in the nest. She had sat ten days, when I looked in the nest and saw that two young birds were hatched. She did not seem to notice them, but began to sit on the remaining three eggs. I put near the nest some egg chopped fine and bread-crumbs. I then moved her off the nest, and, after waiting some time, closed the door. She then appeared to understand what was expected of her, and commenced feeding them, and then went on sitting on the eggs. Next day two more young birds were hatched, the remaining egg proving addled. In a fortnight the young had a good many feathers, and in time they all got out of the nest. I think they are hardy birds, for when I went for my holidays I took them with me to Somersetshire, stopping first at Oakhill, near Bath, and then at Locking, near Weston-super-Mare, and from there returned to my home in London, but they were not affected by the journey. Whilst the old Gold-

finches were breeding I fed them on canary-seed, soaked rape-seed, and Hartz-Mountain bread, as well as on egg and soaked bread.—E. BENNETT (Romanhurst, Highgate, N.).

Ornithological Notes from the Lake of Lucerne.—A few remarks on the result of my experiences at Brunnen, on the Lake of Lucerne, during the month of July last, may perhaps be acceptable to readers of 'The Zoologist.' This beautiful neighbourhood possesses two great advantages for the lovers of birds—the avifauna is decidedly rich, and the locality easy of access. I observed sixty-three species during the month of July, although the weather was somewhat unfavourable, for we had some days of excessive heat, followed by thunder-storms, and then more than a week of heavy rain. The four most noteworthy birds were the Wall Creeper, *Tichodroma muraria*, the Crag Martin, *Cotyle rupestris*, the Marsh Warbler, *Acrocephalus palustris*, and Bonelli's Warbler, *Sylvia bonellii*; but besides these there were many other interesting species, such as the Black Kite, *Milvus ater*, and the Crested Tit, *Parus cristatus*, which was plentiful everywhere. The great rock called the Axenstein, which rises to a height of about 2400 ft., forms with its slopes and terraces a splendid observatory, and earlier in the season would have been a still richer field for the ornithologist. Mr. Warde Fowler and Mr. Playne accompanied me there on July 10th, and they were greatly pleased with the evidence of bird-life around us. From the Axenstrasse, that magnificent road which leads from Brunnen to Pluelen, I was fortunate enough to observe the Wall Creeper ("Mauerspecht," as it is there called) on the rocks above. Mr. Algernon Harris, of Dublin, who accompanied me, had first noticed it on the rocks below, where he saw it creeping upwards from the margin of the lake, peering into all the cracks and crevices as it went, and pausing from time to time to devour with much satisfaction what insect-food it found therein, and then flying down again to the water's edge. When I saw it first it had mounted the rocks above the road, and gradually pursued its erratic course until out of sight. The exact spot where we observed it was on the Axenstrasse, just beyond the celebrated Tunnels, about a quarter-of-an-hour's walk from Tell's Chapel. I had intended to go far afield to look for this most interesting bird, and was charmed to find it so near at hand. Herr Shaeck, of Brunnen, told me that it came closer up to the village, and that in winter it had even entered his house. Around these well-known tunnels great numbers of Crag Martins pursued their almost ceaseless flight, and their resting-places were readily discernible in the rocks above. A few House Martins were mingled with them, but the Crag Martins were greatly in the majority. We did not anywhere see a Sand Martin, but on two occasions we noticed the Alpine Swift, *Cypselus melba*. Amongst his dusky congeners the Marsh Warbler, *Acrocephalus palustris*, was observed hard by in all the ponds and streams in the neighbourhood, and especially along

the banks of the Muotta. It has a sweet song of its own, and almost unrivalled powers as a mocking-bird. I heard it imitate the Nuthatch, Wagtail, and other birds with wonderful accuracy. Bonelli's Warbler was quite common in all the woods; it is indeed the Warbler *par excellence* of Brunnen. In appearance it resembles the Wood Warbler a good deal, and its note, which is repeatedly uttered, also reminds one of that bird; it is certainly one of the poorest songsters amongst all the Warblers. There were several birds common in England which we failed to find near Brunnen, notably the Sky Lark, Greenfinch, Jackdaw, Rook, Sand Martin, and a few others; on the other hand, we had the Cuckoo, Corn Crake, and Quail, infrequently met with elsewhere. On the whole, I think it would be very difficult to find a district more likely to reward the observant ornithologist than this, especially if he were to arrive in May or June; and in this opinion Mr. Fowler, from his brief survey of the locality, quite agreed. I was sorry that he and his enthusiastic young friend Mr. Playne were only able to spend two days in the neighbourhood. At Brunnen we noticed some large vipers, one of which seemed to be fully two and a half feet long, and it bit savagely at my companion's stick. On one occasion a Weasel ran out from the grass on the side of the road, and running over to my friend George P. Farran, who stood perfectly still, it planted its two fore paws on his trousers, and then, turning round, ran on before us, frisking hither and thither like a kitten, with its tail in the air.—CHARLES W. BENSON (Rathmines School, Dublin).

Partridges Migrating.—Have any of your readers observed Partridges migrating? In 1889 there was an unusual number of coveys here. I left a full stock, hoping for an increase the following year. Late in 1889, about November 31st, I saw on a road near here a very large number of Partridges. They went off towards the hills to the south-west. About two miles further on the same road I saw another large pack, which flew off in the same direction as the others. Since then I have had very few. In 1889 several coveys appeared in my fields which were certainly not there at the beginning of the season, and which I believe must have come from a distance.—MATT. WELD O'CANNON, Baltrasna, Oldcastle).

[Something of the same sort has been observed in the case of Grouse. See Clarke and Roebuck, 'Handbook of the Vertebrate Fauna of Yorkshire,' p. 62.—ED.]

American Red-breasted Snipe in Ireland.—On the 29th September last I obtained a bird of this species, which had been forwarded to the Dublin market, together with a lot of Common Snipe, from Maryborough, Queen's County. The specimen proved to be a female in the immature plumage of autumn, and is the first time this species has been known to occur in Ireland.—E. WILLIAMS (2, Dame Street, Dublin).

Solitary Snipe in Co. Mayo.—A specimen of this rare visitor to Ireland was shot on October 13th by Mr. T. L. Mason, at Ballycroy, Co. Mayo. On dissection, the bird proved to be a female in good condition, weighing seven ounces. This is only the fifth occurrence, so far as ascertained, of this species on the west coast within the last few years.—E. WILLIAMS (2, Dame Street, Dublin).

The Cormorants in St. James's Park.—Though late in the day to make the request, I venture to ask you, if you can, to spare a corner in your columns to place on record the fact—unnoticed hitherto, so far as I am aware, in any public print—that the captive Cormorants bred this year for the first time in St. James's Park. The birds were brought from the Megstone Rock, the most northerly of the group of the outer Farne Islands, in 1888, a few weeks after the visit of a fine, apparently wild, Cormorant, in full adult plumage, to London waters had been noted in 'The Times.' Neither their appetites nor their digestions suffered by the change from the bracing air of Northumberland, and a day or two after their arrival one of the party, at the time barely two-thirds grown, after swallowing a couple of haddocks, bolted a full-sized rat, just killed and dropped accidentally near it, and at once opened its beak to ask for more. They showed no signs of breeding until 1892, when a pair, then in their fifth year, took possession of a nest which had been prepared for them, and one egg was laid. Under natural conditions a Cormorant's egg is strong-shelled, and so thickly coated with lime as to look often less like a real egg than a carelessly-cut model in chalk. The last year's egg was thin-shelled, and so brittle that it broke under the weight of the bird. The keeper, gathering from this that more tonic food was needed, has this year, when feeding the birds, powdered the fish with pounded shells. The experiment has proved successful, and late in the season two satisfactory eggs were laid, one of which was hatched about the end of the first week of September, some two or three months behind the usual hatching time of the species. The nestling has been devotedly tended by both parents, who have until very lately fed it regularly from their own crops with half-digested fish, and so closely brooded it that it has seldom been possible to see it without disturbing them. To the usual perils of infancy has been added in this case an invasion of the corner of the lake railed off for the use of the Cormorants by a couple of White Swans, who, "like eagles in a dove-cote," fluttered the old birds and drove their charge from the nest. But all have been safely passed; and, in spite of its unseasonable arrival, the young bird, as I saw it yesterday, is well grown and healthy, and promises, before winter sets in in earnest, to be strong enough to struggle effectively for existence on its own account.—T. DIGBY PIGOTT (5, Ovington Gardens, S.W.).—'*The Times*,' Oct. 25th.

[Some years ago a pair of trained Cormorants which had been tem-

porarily deposited by their owner, Capt. F. H. Salvin, at the Gull-pond in the Zoological Gardens, Regent's Park, nested there, and a young one was hatched and reared.—ED.]

Short-eared Owl in Hampshire in Summer.—Some eight years ago (Zool. 1885, p. 434), I called attention to the occurrence of this species upon an extensive heath-land in south-western Hants in the month of May. During the past very hot and dry summer I was informed that two birds of the same kind frequented the same heathy moorland. I gave little credence to the report at the time, but at the end of July one was killed, and on the 24th of August another was caught in a pole-trap. The former was very pale in colour, possibly a female, beside being much mutilated and decomposed; but the latter was a dark-plumaged male in good condition and perfect feather. I am not prepared to say that either of these were the birds reported in the earlier part of the season, but their occurrence upon the dates named is very early for this locality if they were migrants. I have been unable to obtain any evidence of the species nesting in the neighbourhood. Although this bird usually rests on or near the ground, and seldom settles on the branch of a tree, yet the situation in which the male was secured (namely, in a pole-trap) is a proof that it avails itself—at least occasionally—of an elevated perch, and in this case, were it not for the trap, it might have proved an advantageous “look-out” from which to watch for prey. On dissection, I found no mammalian remains in the stomach, but an almost entire carcase of a hedgessparrow and the head and legs of a “titlark,” together with a few small larvæ, and fragments of Coleoptera, the latter possibly from the stomachs of the small birds. The robust and well-conditioned body indicated that the bird in question had provided itself with a sufficient supply of food, wherever it might have fared, and in this respect it differed from the general appearance of migrants on their first arrival, especially if the journey was a long one. Whilst on the subject of Owls, it may be of interest to note that during the past summer I knew of two localities, some miles apart, where Long-eared Owls successfully reared a brood, and in one instance I had the pleasure of seeing an old bird feeding two fluffy youngsters as they sat upon the branch of a tree, looking almost like two balls of grey down. They were being regaled upon fragments of Yellow Bunting.—G. B. CORBIN (Ringwood, Hants).

FISHES.

The Tunny in the Solway Firth.—When engaged in preparing a report on the fishes of the Solway Firth for embodiment in the ‘Fauna of Lakeland,’ I was unable to decide whether the Tunny, *Oreynus thinnus*, should or should not be included. William Borrowdale, of Glasson, one

of the oldest fishermen on the firth, assured me, about ten years ago, that he had met with one or two Tunnies during the previous fifty years; but I could obtain no conclusive evidence on the subject. I have now the pleasure of stating that the Tunny does, at least occasionally, visit the N.W. coast of England, having received a fresh specimen, captured near Silloth in August last.—H. A. MACPHERSON (11, Victoria Place, Carlisle).

Lesser Fork-beard in Plymouth Sound.—On September 12th I caught in a trammel-net, in Plymouth Sound, a specimen of the Lesser Fork-beard, *Raniceps raninus* (Day); also, on Sept. 20th, a Red Mullet, *Mullus surmuletus* (Day), off the Cornish coast, measuring 17 in. long from tip of nose to tail, $10\frac{1}{4}$ in. in girth, and weighing 2 lbs. 6 oz.—H. L. POPHAM (Royal Western Yacht Club, Plymouth).

[The Fork-beard, which frequents the coasts of Northern Europe, extending to the south coasts of England and Ireland, is not very frequently met with, but several instances of its capture have been recorded from time to time in 'The Zoologist.' For example, on the Norfolk coast (Zool. 1844, p. 532, and 1846, p. 1264); in Mount's Bay, Cornwall (Zool. 1863, p. 8642), where in 1864 three more were captured, and in 1866 two; at Penzance in 1872 (p. 2947), 1876 (p. 5128), and 1878 (p. 109). As regards Devonshire, a specimen in Mr. Rowe's collection was taken some years ago at Plymouth. Mr. Ogilby observed (Zool. 1876, p. 4903) that the curious fact of this fish being generally washed ashore dead tended to prove that it lives in very deep water, where neither nets nor lines can be used, and where perhaps it is not so rare as is supposed.—ED.]

Bonito in the River Dee.—Mr. McKie, hon. curator of the Kirkcudbright Museum, has kindly furnished me with particulars of the recent capture of this rare fish in a salmon-net at the mouth of the Dee. It is being mounted for the Museum, which already contains a more than ordinary collection of well-mounted fish. This is only the third record of the Bonito in local waters, so far as I am aware. One was caught at the Bowes Scaur on July 25th, 1831. Another was captured on July 22nd, 1842, near to Caerlaverock Castle, and was sold in Dumfries. Since then I am not aware of any other instances of the capture of this species in or near the Solway.—R. SERVICE (Maxwelltown, Dumfries).

CEPHALOPODA.

Rossia Oweni on the Anglesea Coast.—When staying at Rhostreigr in May, 1892, I obtained an example of this Cephalopod, which had been picked up on the beach in Cymmeran Bay in the preceding winter. Mr. W. E. Hoyle has kindly identified the specimen (a female), which is now in the Owen's College Museum, Manchester.—CHAS. OLDHAM (Ashton-on-Mersey).

SCIENTIFIC SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.

October 4, 1893.—HENRY JOHN ELWES, Esq., F.L.S., F.Z.S., President, in the chair.

Mr. Arthur Ernest Gibbs, F.L.S., of The Hollies, St. Albans, was elected a Fellow of the Society.

Mr. F. Merrifield exhibited specimens showing the effects of temperature in the pupal stage on several species of Lepidoptera. *Vanessa polychloros* was much darkened, especially towards the hinder margin, by a low temperature. *Vanessa c-album* showed effects on both sides, especially in the female; they were striking on the under side. Several examples of the striking effect produced by temperature on the summer emergence (*prorsa*) of *Araschnia levana* were exhibited. Some *Vanessa io* showed the gradual disintegration, by exposure to a low temperature, of the ocellus on the fore wing, which in the extreme specimens ceased to be an ocellus, and was a remarkable confirmation of Dr. Dixey's views of the origin of that ocellus, as exemplified in the plate attached to his paper in the Entomological Society's Transactions for 1890. Mr. Goss stated that in his experience of *V. c-album* in Northamptonshire, Gloucestershire, Herefordshire, and Monmouthshire, the form with the pale under side was the first brood, occurring in June and July; and that the second brood, occurring from the end of July to October, was invariably dark on the under side. Mr. Jacoby, Mr. Merrifield, and the President continued the discussion.

Mr. A. H. Jones exhibited Lepidoptera collected in Corsica in June last, including dark forms of *Polyommatus phlœas* (Vizzavona); *Lycæna astrarche*, in which the orange marginal band is very brilliant on upper and under sides of both wings (Vizzavona); *Lycæna argus*, the females of which are much suffused with blue, probably var. *calliopsis*; a series of *Vanessa urticæ* var. *ichnusa*, bred from larvæ found at Vizzavona (4000 feet); *Argynnis elisa*, *Satyris semele* var. *aristæus*, *Satyris neomiris*, *Cænonympha corinna*, both spring and summer brood (Vizzavona); *Syrichthus sao* var. *therapne*, and many others.

Mr. G. C. Champion exhibited, for Mr. G. A. J. Rothney, a number of *Methoca ichneumonoides*, Latr. (female), taken at Bexhill, Sussex, showing great variation from the usual large black and red form to a small and nearly black one.

Dr. D. Sharp exhibited a pupa of *Galleria melonella*, on which the eggs of a parasitic Hymenopteron, as he believed, had been deposited while the insect was in the cocoon. He also exhibited, from the collection of Alexander Fry, Esq., the hitherto unique *Aprostoma planifrons*, Westw. The genus was correctly assigned by Westwood to the *Colydiidæ*, though described as a Brenthid.

Mr. J. J. Walker exhibited the following species of *Halobates*, viz.:—*H. sericeus*, Esch., from the Pacific; *H. sobrinus*, B. White, from Marquesas Islands; *H. wüllerstorffi*, Esch., from Marquesas Islands; *H. princeps*, White, from the China Sea; and a female of *H. wüllerstorffi*, with ova attached.

Mr. W. H. B. Fletcher showed a variable series of seventy-five *Cymatophora or*, bred in 1893 from larvæ from Sutherland, a series of about forty *C. ocularis* bred-in from stock from Oundle. Also a series of thirty-three moths, all females, supposed to be hybrids between *C. ocularis* male and *C. or* female, from the above stock in each case, bred as a second brood in August and September, 1893. He stated that he placed the reputed parents in a muslin sleeve on a branch of *Populus nigra*, and did not open the sleeve until the resulting larvæ required fresh food. To the best of his belief the female parent had no chance of pairing with a male of her own species. The supposed hybrids resembled the female parent, except that both orbicular and reniform stigmata were very conspicuous, being pure white filled up slightly with black, whereas in *C. or* they are usually inconspicuous and the orbicular are sometimes wanting. None of the *C. or* bred had the stigmata developed so fully as had the hybrids, which were most uniform in this respect.

Mr. F. J. Hanbury exhibited a specimen of *Leucania vitellina*, taken at Brockenhurst on August 24th, 1893, by Mrs. Hanbury, and another taken by himself at Freshwater, Isle of Wight, on September 7th; also an extraordinary *Gonepteryx rhamni*, showing red blotches at the tips of the fore wings, taken by a gardener at Walthamstow, Essex.

Mr. C. G. Barrett exhibited a gynandrous *Argynnis paphia* recently taken in the New Forest by Mr. Cardew.

Mr. J. M. Adye exhibited a specimen of *Deilephila livornica* recently caught at Christchurch, Hants.

Mr. Elwes exhibited and described two species of the genus *Æneis* (*Chionobas*, Bdv.), *Æ. beani* and *Æ. alberta*, from North America, which had not been previously described, and stated that he had prepared, with Mr. Edwards's assistance, a revision of this very difficult genus, which would be read at the November meeting.

Mr. Osbert Salvin communicated a paper entitled "Description of a new genus and species (*Baronia brevicornis*) of *Papilionidæ* from Mexico," and exhibited both sexes.

Dr. Sharp read a paper entitled "On the Cost and Value of Insect Collections." Mr. W. F. H. Blandford, Mr. McLachlan, Mr. Jacoby, Mr. Waterhouse, and the President took part in the discussion which ensued.

Professor Auguste Forel communicated a paper entitled "Formicides de l'Antille St. Vincent, récoltées par Mons. H. H. Smith."

Mr. W. F. H. Blandford read a paper entitled "Description of a New Subfamily of the *Scolytidæ*." The President, Mr. Jacoby, and Mr. Waterhouse took part in the discussion which ensued.

October 18.—HENRY JOHN ELWES, Esq., F.L.S., F.Z.S., President, in the chair.

Professor C. H. Tyler Townsend, of the Institute of Jamaica, Kingston, Jamaica, was elected a Fellow of the Society.

Mr. R. Adkin exhibited two *Leucania vitellina* and one *L. extranea*, taken by Mr. B. W. Adkin in the Scilly Islands, in August, 1893.

Mr. R. South exhibited a specimen of *Polyommatus batiscus*, and a number of varieties of *Chrysophanus phlœas*, captured in Kent, in September last, by Mr. Sabine; also a curious variety of *Argynnis euphrosyne*, taken in Lancashire in May, 1893, by Mr. T. Baynes; a pallid variety of *Vanessa urticae*, taken by Mr. W. E. Cox in Monmouthshire, in July, 1893; and a *Triphana pronuba*, the right wings of which were typical, and the left wings resembled the variety *innuba*, caught at sugar, in Dovedale, Derbyshire, by Mr. Blagg, in July, 1893.

Mr. G. H. Verrall exhibited a specimen of the Tsetse (*Glossina morsitans*), and also one of the common European allied species (*Stomoxys calcitrans*). He also exhibited a specimen of *Hamatobia serrata*, Dsv., which he stated was not uncommon on cattle in England, but believed to be harmless; while in North America the dreaded "horn-fly" is said to be the same species.

Mr. Elwes exhibited a larva which he had found three days previously under stones on a moraine, apparently quite destitute of vegetation, in the Tyrol, at an elevation of about 7000 feet. He remarked on the number of Alpine butterflies, some of them in fresh condition, which he had seen whilst chamois-hunting in the Tyrol during the last week, and he suggested that in such a fine autumn as the present one collectors might find more novelties among the larvæ of Alpine species than in the summer.

Colonel Swinhoe read a paper entitled "A list of the Lepidoptera of the Khasia Hills" (Pt. 2). Mr. Elwes said he thought all entomologists would be grateful to Colonel Swinhoe, Mr. Hampson, Mr. Meyrick, and others, for the work they had recently been doing in describing the moths of India; but as the district of the Khasia Hills was probably richer in species than any other part of India, except Sikkim, and new species were being received almost daily, it was impossible to make any list complete. Mr. Jacoby, Mr. McLachlan, Mr. Jenner Weir, and Colonel Swinhoe continued the discussion.

Mr. E. Meyrick communicated a paper entitled "On a Collection of Lepidoptera from Upper Burma." The author stated that the species enumerated in the paper were collected by Surgeon-Captain Manders whilst on active service in the Shan States and their neighbourhood, shortly after the British annexation of the territory. A discussion followed, in which the President, Surgeon-Captain Manders, and Colonel Swinhoe took part.—H. Goss, *Hon. Secretary*.

NOTICES OF NEW BOOKS.

Zoology of the Invertebrata: a Text-book for Students. By ARTHUR E. SHIPLEY, M.A. 8vo, pp. viii & 458. London: Adam & Charles Black. 1893.

THANKS mainly to the rise of the Cambridge school of biologists, English students are now able to obtain suitable textbooks written with a knowledge of their needs, and doing justice to English workers. Mr. Shipley's new book comes well in this category, and supplies a distinct want of students for honours in elementary zoology, or a pass at degree examinations. He has wisely omitted detailed descriptions of those selected types that are to be found in more elementary text-books, and has chosen other types for full description, thus materially aiding the student. His definitions are good and full, his descriptions clear and useful, his tables well arranged. Few omissions of consequence are noteworthy, remarkable exceptions being the Rotifers, whose morphological importance is immense, and *Phoronis*. Here and there we have noted slight blemishes, the citation of which in a review would give them a disproportionate and undue prominence. Rather more serious is the description of the "nauplius eye" as a "simple eye" when its triple nature is unmistakable, and the omission to note the presence of the "entosternite" in Crustacea, as first shown by Prof. Lankester. The reviewer is pleased to note the acceptance of his views on the importance of anal respiration in this group. Indeed in every respect the work is well up to date.

The get up of the book is very good; binding, type, and illustrations are equally creditable to the publishers. But the paper is far too stout: the 'Century' magazine is a standing proof that paper scarcely half as thick is sufficient to do justice to printing and woodcuts; and bulk and weight are serious disadvantages in a text-book intended and surely destined for frequent use. We regret to see the un-English spelling "development" throughout the book—a spelling which somehow brings to our mind a suggestion of Gretna Green.

M. H.

THE ZOOLOGIST.

THIRD SERIES.

VOL. XVII.]

DECEMBER, 1893.

[No. 204.

GILBERT WHITE AND HIS SUSSEX CONNECTIONS.

BY THE REV. PREBENDARY H. D. GORDON, M.A.

[IN 'The Zoologist' for August last (pp. 295—301) the Vicar of Harting, in which parish Gilbert White's parents for some time resided (*vide antea*, p. 202), gave a most interesting account of the family and its connections with Sussex. Continuing his researches, he has been good enough to communicate to us the following additional remarks, which illustrate the extent of White's out-door observations in Sussex while resident at Selborne, in the adjoining county of Hants.

It is hardly necessary to remind our readers that the diaries quoted by Mr. Gordon were long ago brought to the notice of the public by the late Edward Jesse, who in the second series of his 'Gleanings in Natural History' (pp. 144—210), published copious extracts from them. This, however, is no reason why they should not again be utilised for the present purpose, especially as the extracts selected are followed by the comments of so good an observer as Mr. Gordon, resident in the county to which they relate.]

THE complete diaries of Gilbert White for nearly twenty-five years (1768—1793, perfect to June 15th, 1793, and filled in to June 22nd, four days before his death) constitute a literary treasure. They were purchased by the British Museum in 1881, from the Rev. G. Taylor, who had the volumes from a Mr. G. Soaper. Like all White's productions, they are exquisite in workmanship, faultless in neatness and precision to a day, and even an hour, and most delectable study. Again and again you begin a new year with him feeling that you are in far closer

contact with him than before, as he guides you from the dismal dark days of midwinter to the hopes of spring even in January, and to the many "sweet days" to follow—his favourite quotation from George Herbert—by far the majority of the days of the year have their appropriate natural history observation. The idea of the diary, and so of the 'Selborne,' came from Hon. Daines Barrington, "The Inventor" (*sic*) of the diaries or calendars of observation, one of which was annually presented to G. White, from 1768 onwards. Perhaps it was too much flattery to say that the dross of Bishop Pearson was fine gold; but the residuum of Gilbert White, after the materials utilized in his 'Selborne' were extracted from the venerable old diaries, is still golden to the bottom of the pot. The volumes, now six in number, as a piece of biological archæology, ought to be some day printed *verbatim*. They show how gradually White felt his way to his conclusions, how he repeated his observations (for example, how in his regular harvest excursion in September and October he noted the Ring Ouzels on the Sussex Downs year by year), how he sometimes most patiently corrected mistakes, how he omitted doubtful evidence, and how wide a tract of country fell under his observation. When a man whose head-quarters are East Hants tells you exactly where he was to a day, and even an hour, for twenty-five years, it is likely that, however retired the autobiographer may be in his habits, he will show that he spent his days in many parts of counties so diversified, and yet so interconnected, as are those of Hants and Sussex.

The object of the present sketch is to trace, day by day, Gilbert White's sojourns in the South Downs and other Sussex localities. This has never been done before, and cannot fail to interest the Sussex reader. His 'Selborne' tells us how much he admired the South Downs, "heaving their broad backs into the sky," how "their gentle swellings and smooth fungus-like protuberances, their fluted sides, and regular hollows and slopes, carry at once the air of vegetative dilatation and expansion" (Letter xvii.). The diaries show that he visited Sussex and its downs regularly, save in 1774, every year from 1768 to 1779. One day, Nov. 13th, 1771, he saw no less than sixteen Fork-tailed Kites at once on the downs near Ringmer. He generally visited Chilgrove, both on the way to Ringmer, near Lewes, and again on returning. It will be news to Sussex readers that Gilbert

White has references to Goodwood, Midhurst, Iping, Uppark, Harting, and Funtington.

Three days of eight hours—twenty-four hours in all—were all that were available for the study of twenty-five years' diaries at the British Museum, that is one hour for each year, to study, compare, and transcribe notes which sometimes, as in the time of his deafness (Sept. 13th, 1774), were very voluminous. It will be pardonable, therefore, if there are some omissions in the evidence submitted.

The first volume has the following entry:—"1768, Sept. 30: Stares (Starlings), flock at Chilgrove. Stone Curlew does not flock yet." It will be remembered that the information about Stone Curlews was supplied by Mr. G. Woods, of Chilgrove. Almost to a day a similar entry occurs the following year, 1768, Oct. 1st: "Harvest pretty nearly finished this evening; some wheat out at Harting [as he was returning from Chilgrove to Selborne]; roads much dried." 1769: "Sept. 12: Wheatears (*Ænanthe*) still caught on East Sussex Downs. Sept. 18th: Bustards on the downs, Ringmer. G. W. stayed at Ringmer till 30th September."

Elsewhere in this diary White says that he saw Bustards, Feb. 13th, 1770, on Salisbury Plain, and that when seen on the downs they resemble Fallow Deer at a distance. "1770: Chilgrove, Oct. 2, 3, 4. Oct. 2: Ring Ouzel on Harting Hill." No doubt on the down near Two Beech Gate, and on the road to Chilgrove. "Oct. 3: Ring Ouzels again on the downs eastward." These are part of the observations on the Ring Ouzel which he claimed to have discovered as a summer migrant, and which he says were cantoned all along the downs and coast of Sussex, as specially observed by him in the autumn of 1770 (Letter xxxviii.). Ringmer, at Mrs. Snooke's house a fortnight, Oct. 5th—19th. First observations on Crossbills, amongst Mrs. Snooke's Scotch pines. Chilgrove again, Oct. 19th, 20th: "Vast floods on the Sussex rivers. They call their meads by the river-side 'brooks' in Sussex."

"1771, April 1. Mr. Woods, of Chilgrove, had, on this day, twenty-seven acres of spring corn wheat not then sprouted out of the ground; and yet he had a good crop from those fields, not less than four quarts to the acre." July 22nd—27th, Gilbert White visits Funtington, where he finds "Peas cut; turnips failing and resown." Oct. 30th, 31st, Chilgrove. "Curlews (*i. e.*

Stone Curlews) have cried here within these few days. Haws fail here. An imperfect rainbow in the fog; a more vivid one on the dewy grass. Grey Crows near Southwick. Mr. Woods saw many Redwings about the 31st October. Nov. 2: Mrs. Snooke's Tortoise begins to hide himself for the winter." This is the first mention of "Timothy," the immortal Tortoise, who lived fifty-four years, fourteen of which were spent at Selborne. "Nov. 1: Mrs. Snooke's Tortoise begins to scrape a hole in the ground for laying up. The vale of Bramber and the river enveloped in a vast fog; the downs were clear. Three House Swallows, Nov. 4, at Newhaven, mouth of the Lewes river, flying briskly; and *Phyteuma orbicularis* ('the Pride of Sussex') in bloom on downs south of Lewes. Nov. 8: few petrifications about Ringmer and Lewes. Ringmer soil not clay at top, but brick-loam; bears good apples, pears and grapes, the clay under which holds water like a dish. The trees are mostly elms. Nov. 11: Tortoise comes out in the sun about noon, but soon returns to his work of digging a hole to retire to. Nov. 13: saw sixteen Fork-tailed Kites at once on the downs. An epidemic disease amongst the dogs in Sussex, which proves fatal to many; they pine away and die moping. Chilgrove, Nov. 15: Tortoise at Ringmer had not finished his hybernaculum, being interrupted by the sunny weather, which tempted him out."

1772. This was the year in which the explosion of the powder mills at Hounslow "shook the windows at Selborne, Jan. 6." "May 21: at Midhurst and Findon, *en route* for Brighton and Ringmer next day. Tortoise eats. Flycatcher appears." From this visit Gilbert White returned *viâ* Arundel and Chilgrove to Selborne, where he arrived on June 6th.

1773. December 1st, Chilgrove: "Birds on the downs are Rooks, Larks, Stonechats, Kites, Gulls, some Fieldfares, some Hawks. Not one Wheatear to be seen on the downs yet." They were, of course, absent on winter migration. "Grubs of *Scarabæus solstitialis* abound on the downs; the Rooks dig them out. On what do they feed when they come forth? for there are no trees on the South Downs. The county of Sussex abounds in turnips. The Tortoise in Mrs. Snooke's garden went underground Nov. 21st; came out on 30th for one day, and retired to the same hole; lies in a wet border in mud and mire! with its back bare. In the late floods the water at Houghton went over the clappers, and at Bramber into men's ovens. Dec. 11: flocks of Chaffinches

and multitudes of Buntings at the foot of Mt. Caborn. Rooks visit their nest-trees every morning just at the dawn of day, being preceded a few minutes by a flight of Daws; and again about sunset. At the close of the day they retire into deep woods to roost (Ringmer). Dec. 15, Findon: large Gulls on the downs. Some Bustards are bred in the parish of Findon. Fieldfares. The shepherds do not take any Wheatears west of Houghton Bridge. Dec. 16, Chilgrove: Chaffinches; many cocks among them. Black Rabbits are pretty common on Chilgrove Warren.

“The parish well in Findon village is 200 feet deep. At Moutham on the down the well is full 350 feet. Mr. Wood’s well at Chilgrove is 156 feet deep, and yet in some very wet seasons is brimfull; his cellars are sometimes full.” He reaches Selborne Dec. 18th. It should be added that in 1773, June 22nd—24th, “The King (George III.) came down to Portsmouth to see the fleet. The firings at Spithead were so great that they shook this house (The Wakes, Selborne). They were heard on those days at Ringmer, two miles east of Lewes, in Sussex, and at Epsom, in Surrey.”

In 1774 there is apparently no mention of the South Downs and Sussex.

1775. March 31st. Gilbert White is again at Midhurst. June 24: Here we have an anecdote apparently picked up at Midhurst: “A person assures me that Mr. Meymott, an old clergyman at Northchapel [near Petworth], in Sussex, kept a Cuckow in a cage three or four years, and that he had seen it several times, both winter and summer. It made a little jarring noise, but never cried ‘cuckow.’ It might perhaps be a hen. He did not remember how it subsisted.” This anecdote, which has been paralleled in Sussex again by the Cuckoo kept at Westbourne Workhouse for three years, half tame,—and silent, as reported to the ‘West Sussex Gazette,’ 1886, by Dr. F. H. Arnold,—is not mentioned in the Nat. Hist of Selborne. As an instance of the great care with which the compilation was made, it may be noted that the mentor, probably T. White, writes in red pencil: “Is Mr. Meymott or any of his family alive, who might confirm the above account?” No reply is entered, and the story is accordingly suppressed. The diary continues: “1775. Chilgrove, Aug. 2: Wheat harvest is general all along the downs. When I came just beyond Findon I found Wheatear traps which had

been opened about a week. The shepherds usually begin catching in the last week in July. Ringmer, female Viper taken full of young, 15 in number; gaped and menaced as soon as they were out. Aug. 7: Timothy, Mrs. Snookes' old Tortoise, which has been kept full 30 years in her court before the house, weighs six pounds three quarters and one ounce. It was never weighed before, but seems to be much grown since it came. (Mentor's note, 'Pray let it be weighed every year'). Aug. 12: Full moon. High tides frequently discompose the weather in places so near the coast, even in the driest and most settled seasons, for a day or two. Aug. 14: Two great Bats [*V. noctula*] appear. They feed high, and are very rare in Hants and Sussex. Low fog. G. W. observed *Cimex linearis*. Also at Chilgrove, Rabbits. Rabbits make incomparably the best turf; for they not only bite closer than larger quadrupeds, but they allow no bents to rise; hence warrens produce much the most delicate turf for gardens. Sheep never touch the stalks of grasses." This passage is given in the "Observations on Quadrupeds," which now is bound with the 'Selborne,' but it is quoted to prove that it was strictly, as the diary shows, an observation made in Sussex. When White returned to Selborne, Aug. 19th, he found the wheat harvest finished, and noted, "Harvest weather much finer at Ringmer than at Selborne." He had evidently greatly enjoyed his Sussex trip in 1775.

"1776. August 15. Chilgrove: Showery." In one of his late expeditions he got thoroughly wet through on the Downs, and seems to have remembered the lesson. Aug. 16th, Ringmer; Aug. 26th, Isfield; Aug. 27th, Ringmer; Aug. 29th, Findon. Aug. 31st, Chilgrove: Arriving at Selborne that Saturday apparently between 4 p.m. and 8 p.m., as marked in the diary, 8 p.m., sun; 12 noon, sun and cloud; 4 p.m., fine harvest day; 8 p.m., Selborne. The last letter is looped to about an hour before 8, so exact was he in chronicling time. No doubt he preached an old sermon at Selborne Church on Sunday, Sept. 1st, 1776. It was in the low damp water-meads of the Ouse, at Ringmer and Isfield, that the observation of the friendship between the Wag-tails and Cows, which is given in "Observations on Birds" ('Selborne'), was originally made. "While the cows are feeding in moist low pastures, broods of Wagtails, white and grey, run picking run round them close up to their noses, and under their very bellies, availing themselves of the insect flies that settle on

their legs, and probably finding worms and larvæ that are roused by the tramping of their feet. Nature is such an economist that the most incongruous animals can avail themselves of each other! Interest makes strange friendships." Ringmer, Aug. 28th: "The Tortoise eats voraciously; is particularly fond of kidney beans. Chilgrove, Aug. 30: Mr. Woods, of Chilgrove, thinks he improves his flock by turning the east country poll-rams amongst his horned ewes. The east country sheep have shorter legs and finer wool, and black faces and spotted forelegs, and a tuft of wool in their foreheads. Much corn of all sorts still abroad. Was wetted through on the naked downs, near Parham Ash [query, where is this?]. Some Cuckows remain. Nov. 30: Mrs. Snookes' old Tortoise, at Ringmer, went underground." With regard to the entry of Mr. Woods and the South Down sheep, I have ventured in the 'History of Harting,' p. 208 (1877), to state that Gilbert White's facts concerning the South Downs were mainly collected in the neighbourhood of Harting. The reviewers, who were in the main very kindly, suggested that all the facts about the South Down sheep were collected by G. White at Ringmer, Lewes, judging from the dates of the "letters"; but the diary proves that Mr. Woods was the informant, and therefore my text was strictly true, and the inference of the reviewers wrong.

1777. This year an entry is made which shows that Gilbert White's observations ranged over a wide district of our neighbourhood. "On July 29th such vast rains fell about Iping, Bramshott, Haslemere, &c., that they tore vast holes in the turnpike roads, covered several meadows, carried away part of the county bridge at Iping, and the garden walls of the paper mill, and endangered mill and house. A paper mill was ruined at Haslemere; a post-boy drowned, and another as he was passing from Alton to Farnham. The gent. in the chaise saved himself by swimming. These torrents were local, and were not felt at Lewes." Under date Sept. 15th White notes the migration of Crossbills at Ringmer. He stays Sept. 15th at Shopwick, near Chichester, and Sept. 19th at Chilgrove.

There is a kind of cadence in the lovely passage on Farnham bells, heard at Moreland, March 10th, 1793, and reminding one of Moore's "Sweet evening bells," "And so 'twill be when I am gone." It will probably be a *locus classicus* to the admirers of Gilbert White. "The sweet peal of bells" at Farnham heard up

the vale of a still evening is a pleasing circumstance concerning this situation, not only as occasioning agreeable associations in the mind, and remembrances of the days of my youth when I once resided in that town, but also by bringing to one's recollection many beautiful passages from the poets respecting the tuneable and manly amusement of bell-ringing for which England is so remarkable. Of these none are more distinguished and masterly than the following:—

Let the village bells, as often wont,
Come swelling to the breeze and to the sun
Half set, ring merrily their evening round.
It is enough for me to hear the sound
Of the remote exhilarating peal,
Now dying all away, now faintly heard,
And now with loud and musical relapse
The mellow changes pouring on the ear."

—*The Village Curate.*

On March 15th, 1793, we have the last glimpse of his South Downs—a day of great vigour:—"My brother and I walked up to Bentley Church, which is more than a mile from his house, and on a considerable elevation of ground. From thence the prospect is good, and you see at a distance Cruxbury Hill, Guild-down, part of Lethe (Leith) Hill, Hindhead, and beyond it the top of one of the Sussex Downs [Query, which is this?]. There is an avenue of aged yew-trees up to the church, and the yard, which is large, abounds with brick tombs, covered with slabs of stone; of these there are ten in a row, belonging to the family of the Lutmans. The church consists of three ailes (aisles), and has a squat tower, containing six bells. From the inscriptions it appears that the inhabitants live to considerable ages. There are hop-grounds along the north side of the turnpike road, but none on the south towards the stream. The whole district abounds with springs. The largest spring on my brother's farm issues out from a bank in the meadow, just below the terrace. Somebody formerly was pleased with this fountain, and has, at no small expense, bestowed a facing of Portland stone, with an arch and a pipe, through which the water falls into a stone basin, in a perennial stream. By means of a wooden trough this spring waters some part of the circumjacent slope. It is not so copious as Well

head." This passage will be a discovery for the Selborne proposers of the Water Fountain Memorial, exactly in keeping with Gilbert White's own approbation at Bentley, his brother's estate. And it shows how Selbornian is the noble idea of giving pure water from Cissbury to Worthing, that has suffered so sorely. Homer would call it a work of the gods.

And here end (1778) the yearly visits of Gilbert White to Sussex, which seem to have been his wont from 1754 at least,—twenty-four years,—as recorded in a previous article. There are one or two notable mentions, however, of Sussex in the later diaries, which shall form our conclusion. 1778 has a brief record: "Sept. 23 and Oct. 9, Chilgrove: Ring Ousels. No Stone Curlews. Oct. 24: Shopwick. Oct. 26: Distress for water at Ringmer." The constant mention of "Timothy," now residing at Selborne, are somewhat tedious; but a passage shall be quoted to show that White wrote playfully sometimes, as when he wrote about the "majestic mountains of the Southdowns"; and Lowell, who must have been Scotch, could not appreciate the joke. With "majestic Southdowns" compare the playfulness of the following: "Sept. 1787: Timothy, the Tortoise, who has spent the last two months amidst the umbrageous forests of the asparagus beds, begins to be sensible of the chilly autumnal evenings." 1782, Aug. 3rd, twenty-six days before the 'Royal George' sank, White noted a vast shower near Petersfield. 1784, the first Swallow was seen near Petersfield by G. W., April 12th. 1788, April 19th: "The voice of the Cuckoo is heard in the land," quoting Canticles, and so nearly matched the spring advent of Milton's bird of hate, punctual then as now. "1789, April 17, *Cuculus cuculat*" (quoting Linnæus): "The voice of the Cuckoo is heard in Blackmoor Woods." Two entries about Up Park and Goodwood remain. "1788, July 6: The late burning season has proved fatal to many deer in elevated situations, where the turf being quite scorched up, the stock in part perished for want. This is said in particular to have been the case in Up Park, in Sussex. A want of water might probably have been one occasion of this calamity. Some Fallow Deer have died in the Holt." Alas! 1893 was also fatally dry for the poor deer. With regard to Goodwood, the entry is 1792, Oct. 9th: "Selborne: The sound of great guns was heard distinctly this day to the S.E., probably from Goodwood, where the Duke of Richmond has a detachment

from the train of artillery encamped in his park, that he may try experiments with some of the ordnance." This year, 1792, has, April 13th, a Swift, which seems miraculous, but no doubt did happen. Also wild mushrooms at the same time, April 13th, 1792. In 1793 we seem to enter the valley of the shadow. But he was still in full vigour, both of mind and body.

To the last the diary was posted up, and prepared till within three days of the actual death, June 26th, 1793. He saw his last Flycatcher May 24th that year, remarking that it was four days late. His last extended entry is June 9th, 1793. "The water at Kingsley Mill begins to fail. The land spring in the Stoney lane, as you go to Rood, stops. We draw much water for the garden; the well sinks very fast. The ground all as hard as iron; we can sow nothing, nor plant out." June 14th. Mr. John Mulso, the old Winchester College boy, Prebendary of Winchester and Salisbury, and brother of Mrs. Chapone (Hester Mulso), White's oldest college friend at Oriel, Oxford, came for a last glimpse, and his old friend notes in his very last entries: "June 14 Mr. John Mulso came, June 15 Mr. J. Mulso left us." Probably he helped his friend, as a clergyman should, at the last. And so the naturalist of Selborne slept, in the midst of his vigour.

At the Commemoration of his Centenary Anniversary, at Selborne on June 24th, 1893, several considered the view that Gilbert White belonged to Hants and Sussex conjointly as visionary and untenable. But in view of the facts above stated, what must be the verdict? Was Gilbert White a Sussex naturalist or not?

ORNITHOLOGICAL NOTES FROM LEICESTERSHIRE.

By F. B. WHITLOCK.

THE following notes are the result of frequent visits to the neighbourhood of Loughborough during the last two or three years. They do not pretend to be of any special interest, but, as field-naturalists are few and far between in the north of the county, they may be worth recording.

1890.

Hawfinches were not uncommon during the breeding season; several nests were found in one small wood. In previous years,

this species, though breeding regularly, had always been scarce. A Wood Warbler's nest was found May 23rd, and two Grasshopper Warblers a little earlier. Moss had been used in the construction of both the latter nests.

In a boat-house by the Soar quite a colony of Swallows had established themselves. On June 15th several nests contained eggs. To gain access, the old birds had to fly in through a hole where a couple of bricks had been dislodged. The owner, to discourage the birds, on account of the dirt they made, wired the hole over, but the birds beat him by skimming under the door.

On Aug. 16th and 17th, noticed a few Common Sandpipers flying by the Soar, and in the morning flocks of Lapwings came from other parts to feed in a favourite meadow.

Sept. 17th. A few Chiffchaffs in the willows by the river; they were uttering their customary notes, but in a very feeble manner, as though they were young birds practising. Also noticed many Missel Thrushes. These birds are very fond of black currants. An island in the Soar, which is planted as an orchard, is visited incessantly when the fruit is ripe. They soon clear a bush.

Oct. 26th. A great many flocks of migratory Thrushes passing to south-west, including Fieldfares, Redwings, and Song Thrushes; a few flocks of Starlings at the same time. Wind strong E. An occasional Hooded Crow or two also seen, and Goldcrests observed in the hedgerows. On the following day a flight of Woodcock arrived.

Nov. 29th. A friend sent me a Water Rail that he had shot, and reported that a large flock of Golden Plovers had passed up the Soar Valley during the week. A good many Snipe were about at this time.

Dec. 2. A few Bramblings were caught by local birdcatchers.

At Christmas the weather was very severe, the ice on the Soar being several inches thick, but a small sheltered dyke near at hand was unfrozen. This was haunted by Moorhens, Water Rails, Common Snipe, and Grey Wagtails, all of which were in very poor condition; indeed, the Moorhens were so benumbed with cold that a fox-terrier caught several by running them into a hedge-bottom. A Common Snipe got up literally from under my feet as I stood talking to a friend on a small culvert. We had been there a minute or two in conversation before it rose. On the ice

were tracks of Little Grebes in the half-melted snow, which had frozen again. The impressions were wonderfully clear, giving one a good idea of the awkwardness of this species in walking. A few days later a flock of thirteen Wild Geese were seen, but the species was not recognised.

1891.

The break up of the frost on 22nd Jan. was followed by a flood, on which numbers of Little Grebes were swimming. Where did they come from? On Jan. 25th the first Lapwings appeared since the hard weather commenced. On Feb. 16th got a glimpse of a small Finch which I believe was a Siskin. On March 29th several pairs of Magpies were building their nests, and in a tall elm was a partially constructed Crow's nest, which I was told was the work of a pair of Hoodies. Whilst I was watching it from a distance, a pair of these birds flew into the tree. However, nothing came of the nest, as both birds disappeared shortly afterwards.

March 25th. A Great Crested Grebe caught in the outwoods, Charnwood Forest. A stream flows through the northern end of the wood, which carries off the surplus water from the adjacent reservoir. I think this bird must have first appeared on the reservoir, and then followed the stream into the wood, where it was captured. A second example was shot near Barrow-on-Soar about April 20th.

April 30th. The first Swifts and Corn Crakes were seen and heard to-day.

May 2nd. Four or five Common Sandpipers, on migration. Tree Pipits had arrived in large numbers; they were in little parties of five or six; not many were singing. The Hirundines were late this season, except a few stragglers. On May 10th large numbers were flying over the Soar; it snowed heavily on 16th.

May 21st. Examined a Nightingale's nest in an old osier-stump covered with ivy. Owing to the tenant of the osier-bed taking a too paternal interest in this nest, the old birds forsook it after laying four eggs; they, however, hatched a second clutch in a nest placed in a similar situation, but the latter nest was quite exposed to view. I heard that a few Wheatears had appeared on migration about a month previously.

May 28th. An old male Kestrel was shot on the outskirts of

Loughborough; it had been attacking the Sand Martins flying over a brick-yard pond; it had an old wound on the tarsus.

June 6th. A lot of water out in the Soar Valley. To reach my old hunting ground, had to wade half a mile. Found a Sky Lark's egg on the top of a mole-hill.

June 18th. Young Lesser Whitethroats pretty common in a large garden. Turtle Doves in fair numbers in the wooded districts.

Aug. 27th. A few Hawfinches about the allotment gardens by the Leicester Canal.

Sept. 2nd. Three Hawks came out of a wood; one, a very small one, either a Merlin or a Hobby, probably the latter.

Sept 19th. Two adult Herring Gulls flying low over the streets of Loughborough. A young Great Crested Grebe shot on the Soar on the 18th, and a Common Tern on the 19th.

Nov. 8th. A few Snipe, Hooded Crows, and Lesser Redpolls about.

Nov. 12th. A Water Rail picked up under the telegraph-wires. The finder named it an "Osier-piper."

Dec. 26th. Wood Pigeons very numerous in Walton Holm. Residents in the district say that these birds come down from the Charnwood Hills every winter; they certainly are more numerous at that season than at any other time.

1892.

Jan. 10th. A friend shot a female Sparrowhawk; soon after he fired, the male appeared in a neighbouring spinney, calling continually. Loth to kill him, my friend eventually had to drive him away with snowballs. A few Mallards visited the river at dusk. Five Wigeons were seen a day or two previously.

March 27th. Heard several Curlews in the wet meadows by the Soar, near Barrow; also a few Hooded Crows. In the leafless hedges Chiffchaffs were not uncommon. It snowed heavily in the afternoon. Flushed a pair of Teal, and saw about twenty ducks that looked like Wigeon.

During April a few flocks of mature Black-headed Gulls passed down the Soar. I examined an example killed in a muddy ploughed field.

April 17th. Saw the first Redstart; a Red-backed Shrike also was heard, in an uncultivated osier-bed.

May 7th. A Magpie's nest contained young, as did a second near at hand. Close to it was a Kestrel incubating five eggs. I also found a Blackbird's nest on the bare ground in the same wood. The eggs were as small as those of the Redwing. I had noticed another nest containing one egg the evening before; I fully expected a second would be laid the following morning, but it was not till 11 o'clock that this was accomplished. Two Little Grebes were building in a backwater of the river, and several pairs of Marsh Tits were about; they were very animated, the males chasing the females, and uttering rippling notes which were quite musical. As schoolboys we always called this species the "Chica-dee-dee," from its call-note.

May 29th. Observed a nest of the Lesser Redpoll in a half-wild garden. It was placed in the upper branches of a dead sloe-bush. There was not the slightest attempt at concealment. The nest contained five eggs. A day or two later I received a Willow Wren from the same locality. It had been strangled by a horse-hair, which a Lesser Whitethroat had left hanging near its nest.

June 26th. A great many Corn Crakes were calling in the low-lying meadows near the Soar.

July 24th. A few young Kestrels about. On one occasion three were observed on the flat roof of a summer-house. They had been feeding on small birds. When rowing on the river we disturbed a brood of young Wild Ducks. The little ones scuttled off into the reeds, but the old duck laid her head and neck flat on the surface of the water, at only an oar's length from the boat. She remained quite still until the last young one had disappeared. A Barn Owl seen flying by the wood side.

Aug. 24th. Thundery weather in the early morning. At about 5 a.m. a large number of Swallows passed over towards the east at a great elevation.

Sept. 1st. A small plover, which I believe was a Dotterel, was in company with a large flock of Lapwings, feeding in a meadow. Owing to the shyness of the latter birds I could not make identity certain.

Sept. 3rd. Ringed Plovers passing over to S.W. at a great height. Wind strong W. A few young Wheatears also seen.

1893.

Feb. 26th. Some gulls seen in the distance, Kittiwakes or Black-headed, probably.

March 24th. Four Black-headed Gulls seen and a Redshank, 25th.

April 2nd. Observed a pair of Tree Sparrows on the island. These birds breed every year in a small overflow pipe.

April 23rd. In certain parts of Leicestershire the Magpie is still pretty common. In a wood of about ten acres I observed four nests. One in an elm, another in an oak, and two in slender fir-trees. One of the latter was the smallest nest I ever saw. The old bird was incubating, and her tail projected several inches outside. I climbed up to the nest, which contained seven eggs. I had the usual difficulty in reaching one. Magpies not infrequently build in tall hedges, but I never find nests in such situations until the foliage is pretty dense. A Grasshopper Warbler "reeling" at dusk, and also at 9 a.m. A friend reports "Bullfinch's nest with eggs, and the Wood Warbler, Nightingale, and Blackcap heard in full song on 18th."

May 7th. Had a run through the Belvoir Woods. Heard several Nightingales. This species was common during the breeding season in Leicestershire. Coots and Little Grebes were breeding on a pond in the old gravel pit gardens, and close at hand I observed a Great Spotted Woodpecker, which I was told had a nest near. Heard a Wood Warbler near the Kennels. The commonest birds in the Vale of Belvoir are the Yellow Bunting, Whinchat, and Greater Whitethroat. Near Harby the Green Woodpecker is pretty frequent.

June 25th. Noticed many pairs of Turtle Doves. This species has much increased during the last ten years.

July 6th. Observed a fine Barn Owl at dusk, and I think I heard the notes of a Woodcock. At 10.30 p.m. I heard a warbler singing in a densely matted portion of the wood, which I feel certain was a Marsh Warbler. This part of the wood is about one hundred yards from the river, and has been nearly cleared of large timber; willows have been planted and allowed to run wild. Convolvulus and other climbing plants grow there very luxuriantly, making the spot very difficult of examination, I have however found nests of the Reed Warbler, Sedge Warbler, and other common species. The warbler I am referring to was singing something like a Nightingale, but the song was not so sweet, nor so sustained, and the bird frequently altered the tone. Owing to the darkness it was impossible to get very close without

disturbing every bird within fifty yards. I listened again, early the next morning, without success.

July 7th. Observed eight Kestrels on the wing at the same time, also many Ring Doves. Though the Stock Dove breeds on Charnwood Forest, they never seem to come down to the lowlands to feed, and although we have shot numbers of Ring Doves, we have not yet obtained the former species. One morning in the previous autumn some large flocks of doves passed over at a great height. They looked too small for Ringed Doves, and I think they may have been Stock Doves. A young Black-headed Gull shot on the Soar.

Aug. 23rd. Some flocks of Dunlins and Ringed Plovers passed over at a great height to S.W. These birds were too high up to be seen, but I clearly recognised their notes. This was about 5 a.m. A little later a Redshank passed in the opposite direction. In the evening two adult Herring Gulls. The following day twenty-three of the same species observed. These Gulls have been rather common this year in the Trent valley.

I am indebted to Mr. T. B. Cartwright, of Loughborough, for some of these notes, and also to Mr. J. B. von Wiedt. The latter gentleman, I regret to say, died 30th July last. His death is a great loss to Leicestershire field-naturalists.

In May and June, Quails were heard calling, on a farm on the outskirts of Loughborough. There is little doubt that a pair or more nested there.

On August 21st a young Cormorant was caught alive in the gardens at Belvoir Castle, and is still in captivity. It takes from eighteen to twenty small fish daily.

Early in the morning of Sept. 11th Mr. Osborne, of Staplefield, at Irton-sidings picked up a disabled Manx Shearwater. He carried it home and kept it alive for some days, but it refused all food. As there had been no previous gale to blow the bird inland, I think its appearance supports my contention that this species migrates across country. Irton-sidings are exactly on the boundary line between Notts and Derbyshire.

NOTES AND QUERIES.

Zoological Maps.—In Mr. Miller Christy's very useful and suggestive paper on Zoological Maps in the last number of 'The Zoologist' (pp. 401–8), he proposes that those for Birds should have the lines of migration indicated by arrows. I wonder if he is aware that in the 'Birds of Devon' such maps have been actually published by Mr. D'Urban and myself, in which the spring and autumn movements of birds to and from the British Islands (more especially as they relate to Devonshire) are attempted to be in this way illustrated?—MURRAY A. MATHEW (Buckland Dinham, Frome).

MAMMALIA.

European Beavers at the Zoological Gardens.—Specimens of the American Beaver have long been familiar to visitors in the Regent's Park Zoological Gardens; but in Europe this animal has become so rare, or at least so restricted in its haunts, that the capture of one, still less the sight of one in London, was scarcely to be hoped for. The acquisition therefore of an entire family, male, female, and four young, from the Lower Rhone, and their successful transport to London, is a very remarkable event, and one which should attract many a curious naturalist to the Zoological Gardens. As to whether the American and European species of Beaver are identical or not, opinions differ; but it is now generally considered that the difference in the shape and length of the nasal bones is sufficient to justify their specific separation. *Vide antea*, p. 314.—ED.

Albino Squirrel.—In 'The Zoologist' for November (p. 426), I reported the occurrence of an albino Squirrel, which was shot at Westonbirt, near Tetbury, on Sept. 11th. Strange to say, another was killed in the same wood about a fortnight later, namely, on October 2nd, and was sent to me for preservation. It proved to be a female, and, like the male previously obtained, was a pure albino.—H. W. MARSDEN (Bath).

[It is a pity that they could not have been both taken alive, instead of being shot, for it would have been interesting to have paired them in a good roomy cage with a tree in it, and have waited to ascertain whether their progeny, if any, would be also white. Possibly they may have been of the same litter.—ED.]

Natterer's Bat in South Lancashire.—Mr. Joseph Chappell has in his collection an example of this species, which was captured in a foundry at Cheetham Hill, Manchester, last Christmas time. The size, pointed tragus, and lash of hairs at the margin of the interfemoral membrane are perhaps sufficient to establish the identification of the species.—CHAS. OLDHAM (Ashton-on-Mersey).

Serotine in Sussex.—On October 5th I obtained two specimens, male and female, of the Serotine, *Vesperugo serotinus*. They were taken in the old roof of our parish church at Arundel, now under repair, and were extremely fat. On the 6th I had another male, killed some four miles away, also very fat. The Great Bat, *V. noctula*, is very common here. The specimens of *V. serotinus* I have are of a greyish brown colour, and the hair very long and silky.—W. B. ELLIS (Arundel).

BIRDS.

Food of the Eider.—An Eider Duck examined on October 26th had in its gullet a Great Spider-crab, *Hyas araneus*, with a carapace, unbroken, of two inches and a quarter long. This is the second large crab I have taken out of an Eider, and on another occasion several cockles and a periwinkle, showing what large crustaceans and mollusks they eat, but probably never fish.—J. H. GURNEY (Keswick Hall, Norwich).

Black Tern in South Lancashire.—On November 3rd I saw a Black Tern, in immature plumage, which was picked up beneath the telegraph-wires, on the railway line between Stretford and Old Trafford, about the middle of September last. (At p. 436, sixth line from bottom, for "Rhos-treigir," read "Rhos Neigir.")—CHAS. OLDHAM (Ashton-on-Mersey).

Woodchat in Worcestershire.—On the 14th May last I saw a Woodchat, *Lanius pomeranus*, on a holly-bush at Weatheroak Hill, Alvechurch, Worcestershire. It was at first remarkably tame, allowing me to scan it carefully, and flew to the top of a tall ash tree, where it perched on a dead twig. It looked down at me inquisitively, showing clearly its beautiful chestnut neck. On being again disturbed, it flew away, uttering a loud metallic note like "clank, clank, clank," and I then remarked that it was accompanied by a mate. I searched the district many times afterwards without again seeing either of the pair, but they were reported from King's Norton and King's Heath. From the descriptions given, there is no doubt that they were the same pair.—F. COBURN (Holloway Road, Birmingham).

Female Merganser assuming Male plumage.—On the 7th March last I received, from County Galway, a Merganser, *Mergus serrator*, which I at first mistook for a young male assuming adult plumage, but upon dissection I was surprised to find that it was an adult female, and from the condition of the ovary I think a very old, barren bird. Mr. H. E. Dresser, who has examined the bird, writes:—"The Merganser is a very interesting specimen, and is, I should say, an old female partially assuming male plumage. It is the first one in that stage of plumage I have seen."—F. COBURN (Holloway Head, Birmingham).

Curious nesting-place of Pied Wagtail.—In May last a Pied Wagtail built her nest in the top of a potato in a field near here. At that time the

tops were very small, and the nest could be seen at a good distance. It was placed on the top of a ridge, and well out into the field.—J. WHITAKER (Rainworth, Notts).

Nesting of the Spotted Flycatcher.—One of these birds built her nest last spring in a small piece of gorse by the side of a plantation in the deer park here. It was placed in the centre of the branch, and was a perfect nest in every way. I have never seen one before which has not had one side against a wall or trunk of a tree. Mr. Cordeaux saw this nest, also Mr. Young, both of whom remarked they had never seen a nest of this species in such a position before. In due course eggs were laid and the young hatched.—J. WHITAKER (Rainworth, Notts).

Baillon's Crake near Nottingham.—I saw one of these birds in Stanley's shop in Trent Street, Nottingham, and was informed that it had been picked up by a man near Gedling station. It was then dead and lying on the road under the telegraph-wires, against which it had evidently flown and killed itself. The date was June 22nd. This is only the second known occurrence of this species in Notts, and I was fortunately able to secure it for my collection of local birds.—J. WHITAKER (Rainworth, Notts).

Sabine's Gull on the N.W. Coast of England.—In confirmation of the Rev. H. A. Macpherson's note (p. 429), I may state that two specimens of this Gull were shot this autumn in or near Morecambe Bay. On October 11th I received a note from a friend residing near Morecambe to the effect that he had obtained a very small Gull which he believed to be "Sabine's," and asking me if I would tell him the distinguishing characteristics of this species. I supplied him with the required information, and on October 24th he wrote again, saying that he had forwarded a Gull similar to the one he had previously procured to my taxidermist. This bird I have since seen, and it is undoubtedly an immature example of *Xema sabinii*.—T. H. NELSON (Redcar).

Night Heron near Belfast.—I have recently had the pleasure of examining, in the flesh, a Night Heron, *Nycticorax griseus*, which was shot on the evening of the 26th October, on a piece of waste land just outside Belfast, known as the "People's Park." In the moonlight the gentleman who shot it mistook it for an owl by its flight, which he describes as slow and lazy. It is a young bird in the spotted plumage; sex not ascertained. To Ireland the Night Heron is a very rare visitor, not more than ten or twelve instances of its occurrence being known.—ROBERT PATTERSON (Malone Park, Belfast).

Sabine's Snipe in Co. Donegal.—On Sept. 28th Mr. R. W. Peebles, of Dublin, shot a very dark specimen of this variety on the mountains near Bonny Glen, Moer, Co. Donegal. This is the same specimen that is

mentioned erroneously in the current number of the 'Irish Naturalist' as having been obtained in Co. Tyrone. It has been preserved by Williams, of Dame St., Dublin.—H. C. HART (Carrablagh, Portsalon, Letterkenny).

Long-tailed Duck in Sussex.—Two Long-tailed Ducks, *Harelda glacialis*, an adult pair, were shot in October near Rye Harbour, Sussex, the female by Capt. Taylor on the 20th, and the male on the 23rd by a fisherman named Sutherden. The tail-feathers of the male were $7\frac{1}{2}$ inches long. Both birds are in the hands of Mr. Bristow, of St. Leonards, for preservation.—GEORGE W. BRADSHAW (Hastings).

The Birds of Pembrokeshire.—Being engaged in preparing a book on the Pembrokeshire birds, which will be published in the course of next spring, I shall be very grateful for any notes relating to the birds of that county, or to those of South Wales in general.—MURRAY A. MATHEW (Buckland Dinham, Frome).

REPTILES.

Adders useful in destroying Voles.—A question which, *inter alia*, came before the Vole Committee last summer was the extent to which Adders might be set down as Vole destroyers, and in their subsequently issued Report it was stated that "Adders feed readily on Voles, but an Adder would probably not kill more than one animal of the size of a Vole in a single day, so there is no reason to extend protection to those venomous reptiles." I have killed Adders frequently that had more than one Vole or Mouse inside. I once killed one with three Voles all swallowed probably within one hour previously. Not long since I was talking to an extensive sheep farmer who had killed every Adder he met with, until one day during the height of the Vole plague he killed one that had just swallowed no less than five Voles, so that the Committee has not given the Adder quite so much credit as it is entitled to. Sheep are often killed if bitten in spring upon the under jaw owing to the rapid swelling that supervenes, and dogs, as everyone knows, are often seriously and sometimes fatally bitten. It is no rare occurrence to hear of bites on human beings, but, so far as I can remember, only one death—that of a rather delicate child—has happened hereabouts in recent years. Protection for these venomous reptiles is, of course, out of the question; but at any rate the good they are able to do in destroying Field Voles should not be overlooked. There is nothing more amusing than the assertions sometimes made—and made in all good faith—as to the length the Adder will grow. The largest one I have yet seen, and it is in my own collection, is exactly $24\frac{1}{2}$ inches in length.—ROBERT SERVICE (Maxwelltown, Dumfries).

SCIENTIFIC SOCIETIES.

LINNEAN SOCIETY OF LONDON.

November 2, 1893.—Professor STEWART, President, in the chair.

Messrs. W. G. Axford and C. W. Nicholls were admitted Fellows, and Mr. H. M. Bernard was elected.

The Secretary having read a list of the donations to the Library since the last meeting, the President moved that the thanks of the Society be given to the donors, and to Lady Arthur Russell, for the valuable collection of engraved portraits of naturalists which she had been so good as to present to the Society in the name of her husband the late Lord Arthur Russell, a motion which was passed unanimously.

The President then referred to the improvement which had been carried out during the recess in the Society's apartments by the introduction of the electric light, for which they were indebted to the liberality of the Treasurer, Mr. Crisp, who on former occasions had shown himself so generous a benefactor, and moved that the hearty thanks of the Society be given to Mr. Crisp for his munificent present. The resolution was carried by acclamation.

Referring to the deaths of Fellows of the Society which had occurred since the last meeting, the President alluded especially to the Rev. Leonard Blomefield, whose connection with the Society, extending over seventy years, had recently been made the subject of a congratulatory address (see p. 418); to Mr. F. Pascoe, the distinguished entomologist, and to Mr. George Brook, whose lamented decease had caused the vacancy in the Council which they now had to fill.

The ballot having then gone round for the election of a new Councillor in the place of Mr. George Brook, deceased, Mr. Henry Seebohm was declared to have been elected.

Mr. George Murray exhibited and made remarks on a series of seaweeds mounted on lantern-slides, some of which were new to Great Britain. He also showed some specially prepared tins, which were recommended for collecting purposes, but which, in the opinion of some present, would be likely to become speedily useless from corrosion.

Mr. Holmes showed some new British Marine Algæ, and made remarks on their affinities.

Dr. Prior exhibited the fully-developed fruit of *Pyrus japonica* from Rogate, Sussex, seldom seen, although the plant is common enough, and alluded to its use as a conserve, if it could be obtained in sufficient quantity.

Mr. Spencer Moore read a paper on the phanerogamic botany of an expedition to Mato Grosso, upon which he acted as botanist. Starting from Cuyaba, the expedition first visited the Chapada Plateau to the east

of that city, where many plants were collected. Thence a journey was made to the new settlement of Santa Cruz on the Paraguay, about half-way between Villa Maria and Diamantino. The flora here is of a mixed character, nearly 37 per cent. of the plants being common to tropical South America, upwards of 27 per cent. occurring in the N. Brazil Guiana Province of Engler, with 20·5 per cent. common to that province and the S. Brazilian, and only 13 per cent. of S. Brazilian types. From Santa Cruz a party penetrated through the primeval forest lying to the north, and reached the Serra de Sapirapan. The forest flora is markedly Amazonian in character, nearly 50 per cent. of the plants being natives of Amazonia or of the neighbouring countries within the N. Brazil Guiana province or related thereto, while the proportion of species common to tropical America falls to rather more than 28 per cent., the South Brazilian element being present only to the extent of 9·5 per cent. Returning to Santa Cruz, the Rio Braciato was partly explored, and the Paraguay ascended to the neighbourhood of Diamantino. The party then came down the Paraguay to the Corumba, where many plants of interest were found. The expedition was partly disbanded at Asuncion. Among the Amazonian plants found at Santa Cruz or in the forest may be mentioned, *Randia ruiziana*, *Bertiera guianensis*, the Loranthad, *Oryctanthus ruficaulis*, *Catleya superba*, *Epidendrum imatophyllum*, *Rodriguezia secunda*, &c. The collections comprise close upon 700 species, of which rather more than 200 were considered to be new, and there are eight new genera. The southward extension of the Amazonian flora to a latitude well within the Paraguay river system was regarded as a noteworthy feature.

On behalf of Mr. G. M. Thomson, of Dunedin, N.Z., Mr. W. Percy Sladen read a paper on a new freshwater Schizopod from Tasmania, illustrating his remarks with graphic sketches on the black-board to indicate its affinities and differences.

ZOOLOGICAL SOCIETY OF LONDON.

Nov. 7, 1893.—Sir W. H. FLOWER, K.C.B., President, in the chair.

The Secretary read a report on the additions that had been made to the Society's Menagerie during the months of June, July, August, and September. Among these special attention was called to four South-Island Robins, *Mira albifrons*, from New Zealand, presented by Capt. Edgar J. Evans; an adult male of Stairs' Monkey, *Cercopithecus stairsi*, presented by Mr. F. Hintze on June 7th; a family of six European Beavers, *Castor fiber*, consisting of a male, a female, and four young ones, from the Lower Rhone; a young Korean Sea Eagle, *Haliaëtus branickii*, obtained from Corea; a specimen of the Great Grebe of Antarctic America, *Æchmophorus major*, figured in 'The Field' of November 18th; and a living

example of the Goliath Beetle, *Goliathus druryi*, from Acera, the largest of known Coleoptera, also figured in 'The Field' of October 21st.

Mr. Sclater read some notes on the most interesting animals he had recently seen at the Zoological Gardens of Stuttgart, Frankfort, and Cologne.

An extract was read from a letter addressed to the Secretary by Mr. J. G. Millais, relating his endeavours to obtain specimens of the White Rhinoceros, *Rhinoceros simus*, in Mashunaland.

A communication was read from Babu Ram Bramha Sányál, describing a Hybrid Monkey of the genus *Semnopithecus*, born in the Zoological Gardens, Calcutta.

Mr. Tegetmeier exhibited a hybrid between Black Grouse and Red Grouse, shot at Balmannock, Kirkcowan, N.B.

Mr. Boulenger read a paper "On a Nothosaurian Reptile from the Trias of Lombardy, apparently referable to *Lariosaurus*." His description was based on a small, nearly perfect, specimen from Mount Perledo, showing the ventral aspect, belonging to the Senckenberg Museum in Frankfort-on-Main, which had been intrusted to him by the Directors of that institution, and was exhibited before the meeting. He pointed out the presence of a series of minute teeth on the pterygoid bones, and an entepicondylar (ulnar) foramen in the humerus. The number of phalanges was 2, 3, 4, 4, 3 in the manus, and 2, 3, 4, 5, 4 in the pes; the terminal phalanx was flattened and obtusely pointed, not claw-shaped. In discussing the affinities of this reptile the author stated that the *Lariosaurus* described by Diecke did not appear to be generically distinguishable from the *Neusticosaurus* of Seeley, which he referred to the *Lariosauridæ*, regarding that family as intermediate between the *Mesosauridæ* and the *Nothosauridæ*, though nearer the latter. The *Mesosauridæ*, in his opinion, formed one suborder, the *Lariosauridæ* and *Nothosauridæ* together a second suborder, of the order *Plesiosaurus*.

Dr. A. Günther read a second report on specimens of Reptiles, Batrachians, and Fishes transmitted by Mr. H. H. Johnston, C.B., from British Central Africa. Dr. Günther also read descriptions of some new Reptiles and Fishes of which specimens had been obtained on Lake Tanganyika by Mr. C. E. Coode-Hore.

Mr. Edgar A. Smith gave an account of a collection of Land and Freshwater Shells transmitted by Mr. H. H. Johnston from British Central Africa. The specimens in this collection, obtained by Mr. R. Crawshay from Lake Mweru, were almost all new to science. He also read descriptions of two new species of shells of the genus *Ennea*.

A communication was read from Dr. A. G. Butler, containing an account of two collections of Lepidoptera sent by Mr. H. H. Johnston from British Central Africa.

A communication was read from Mr. Edwyn C. Reed, containing a list of the Chilian Hymenoptera of the family *Odyneridæ*, with descriptions of some new species.

A communication from Prof. Newton contained the description of a new species of bird of the genus *Drepanis*, discovered by Mr. R. C. L. Perkins in the island of Molokai, Sandwich Islands.—P. L. SCLATER, *Secretary*.

ENTOMOLOGICAL SOCIETY OF LONDON.

November 8, 1893. — HENRY JOHN ELWES, Esq., F.L.S., F.Z.S., President, in the chair.

Messrs. H. J. Turner, F. W. Urich, and J. C. Webb were elected Fellows.

Mr. F. Merrifield exhibited some low-temperature forms of *Vanessa atalanta*, artificially produced, which showed a great reduction in the area of the scarlet bands on the wings, and a great increase in the area of the white and bluish markings.

Professor E. B. Poulton described and illustrated, by means of a map, a simple method for showing the geographical distribution of insects in collections. Below the name-label of the genus, and of each species, were placed coloured slips of such a size as to be distinctly visible at a distance, and the colours, with one exception, corresponded with those made use of in the map at the beginning of vol. i. of Dr. A. R. Wallace's 'Geographical Distribution of Animals.' The exception referred to was the Palæarctic Region, which was coloured blue, instead of pale brown as in the original. Framed maps of the same kind, and coloured in the same way as the one he exhibited, were to be placed in museums, so as to be readily seen from various groups of cabinets. In these maps the names of the Regions, and numbers of the Sub-regions, were distinctly printed, so that they could be read at a considerable distance. Prof. Poulton added that the method he had described was being gradually introduced into the Hope Collections at Oxford. Mr. McLachlan stated that a somewhat similar plan had been adopted in the Brussels Museum by M. Preudhomme de Borre.

Dr. Sharp read and criticised an extract from Livingstone's 'Expedition to the Zambesi, on the habits of a small fighting Ant.

Prof. Poulton read a paper "On the sexes of larvæ emerging from the successively laid eggs of *Smerinthus populi*," and Mr. Merrifield, Dr. Sharp, and the President took part in the discussion which ensued.

Mr. W. L. Distant communicated a paper entitled "On the Homopterous genus *Pyrops*, with descriptions of two new species."

The President read a paper, by himself and Mr. J. Edwards, entitled "A revision of the genus *Æneis*," which he characterized as the most cold-loving genus of butterflies. He also exhibited his complete collection of species of this genus, which was said to be the finest in the world.—H. Goss, *Hon. Secretary*.

NOTICES OF NEW BOOKS.

A Dictionary of Birds. By ALFRED NEWTON. Assisted by HANS GADOW, with Contributions from Richard Lydekker, Charles Roy and R. W. Shufeldt. Parts I and II. 8vo. London : A. & C. Black, 1893.

ALTHOUGH ninety years have elapsed since the appearance of Montagu's 'Ornithological Dictionary,' its general utility, even at the present day, has never been questioned; and considering the increased attention which of late years has been paid to systematic ornithology, it is somewhat surprising that until the present year no one has been found both able and willing to undertake a new Dictionary of Birds brought up to a level with the present knowledge of the subject. Were such a Dictionary confined merely to British Birds, as was the case with Colonel Montagu's work, it would still be a very arduous undertaking, and we should be extremely grateful for it. But Professor Newton, in the volume before us, has not only attempted this, but a good deal more; for he has not only extended his Dictionary to include Exotic species, but has introduced a variety of articles on anatomy, colour, digestive system, eggs, embryology, extermination, feathers, geographical distribution, migration, &c., which make the work a veritable encyclopædia of ornithology.

In the main his volume appears to be founded upon the excellent articles which, in conjunction with the late Professor W. K. Parker and others, he contributed to the 9th and latest edition of the 'Encyclopædia Britannica'; but these have been largely augmented and supplemented by other articles which go to make the series much more complete and useful. A more valuable repertory of the kind has not hitherto appeared; and when the two parts which are still wanting to complete it are to hand, ornithologists will possess a work of reference of exceptional utility.

We cannot go so far as to say that it is as complete as it might be made, or that it is not likely to be improved upon in subsequent editions; for we have noted many omissions of words that we should certainly have expected to find, and would take exception to the introduction of others which, if not

altogether unnecessary, might at all events have given place to some which in our humble opinion are of more importance.

In saying this we make all due allowance for the difficulty of the undertaking. The literature of the subject is so vast, and the sources of information from which key-words may be collected so many and various, that we do not think it would be possible for any author, even with the valuable assistance of such coadjutors as Professor Newton has secured, to embody in a first edition all that goes to make such a work perfect. Indeed, we do not hesitate to say that when the concluding portion of the Dictionary has appeared, the author will be amongst the first to note the improvements which might have been made had the whole been before him in type before sending any portion to press. Herein, perhaps, lies the chief difficulty in attaining perfection; for we have to bear in mind that it is practically the first attempt of the kind that has been made in this or any other country. Having said thus much, we trust that we shall not be deemed hypercritical if we venture to point out a few of the shortcomings which have presented themselves to our notice on looking over the first two parts of the work as issued, and offer a few suggestions which may be useful in the preparation of a second edition which we make no doubt will be called for at no distant date.

To deal first with omissions. We should certainly have expected to find such names as the following:—"Attagen" (Zool. 1884, p. 31); "Beccafico" (Willughby, pp. 216, 227; Jesse, iii. p. 78); "Berkut" (upon which a long article has been written touching its identity ('The Field,' December 27th, 1890); "Coistrel" (Shakespeare, see Kestrel), "Cur" or "Curre," a provincial name for different kinds of diving ducks* (Burton. Anat. i. 96, and Hawker's 'Instructions,' p. 414); "Civetta," the Italian Little Owl, imported by Waterton and liberated in Yorkshire ('Essays,' ii. p. 15; Savi, 'Ornitologia Toscana,' i. p. 76); "Clod-bird," or Clot-bird (Muffet, 'Health's Improvement,' p. 109, and Latham's 'Falconry,' Bk. ii. p. 144). "Cob and Pen": some information on the origin of these names

* It is to be observed that the editor of the recently published 'Diary of Col. Hawker' restricts this name to the Scaup, vol. ii. pp. 361, 364—66, 369—70, 372, &c. But see this author's 'Instructions to Young Sportsmen,' p. 414, ed. 1859.

applied to the male and female Swan would be of interest, and we trust it may yet be supplied under "Pen." "Culver," the old English name for pigeon, used by Chaucer and Spenser, A.S. *culfre*, is not mentioned. "Cushat" is given, though not the etymology, A.S. *cusccote*, a wild pigeon. Ray (1691), quoting Nicholson's 'Glossarium,' gives "*Cowshot palumbus*." "Bullfinch" of course is given, but not "Bullspink," a Yorkshire name for the Chaffinch; "Coppersmith" is given, but not "Copper-finch," by which name the Chaffinch is known in Cornwall. Nor do we find "Colly," a Blackbird in Somersetshire; "Cuddy," Hedgesparrow, and Moorhen (Montagu); "Curwillet," Sanderling, "Crew," and "Cockathodon," names for the Manx Shearwater in Scilly; "Clinker," the Avocet in Norfolk; "Curlew-knave," the Whimbrel in Cumberland (*cf.* Household Book of Lord William Howard of Naworth, 1612—1640); "Eyess," "Gladdie," the Yellowhammer in Cornwall; "Guttercock," the Water Rail in Cornwall; "Gosshatch," the female and young of the Wheatear in Leicestershire (Evans); and "Haggard," a hawk taken after it has moulted in a wild state. To the name "Horn-pie" for the Lapwing might have been added (p. 437) "Hornywink," in use in Cornwall. "Heath-cock" and "Heath-hen" are given, but not "Heath-throstle." "I find," says Dr. Lister, "that the Ring Ouzel is so called with us in Craven, where there is everywhere in the moores plenty of them."—Dr. Lister to John Ray, York, July 2, 1676. (See Derham's Letters of Ray, 1718, p. 140.) The name "Hoop" applied to the Bullfinch in Cornwall might have been given. It is stated (p. 44) that "Blood-olph" is a not uncommon local name for this bird; but we have never met with it, although we have been in almost every county in England. "Judcock" and "Jetcock" for the Jack Snipe have perhaps been omitted accidentally, for these are much commoner names than the last mentioned.

These examples of "missing words" are those which have occurred to us offhand on looking through the Dictionary from A to J. The author will doubtless shelter himself behind the opening lines of his Prefatory Note, wherein he expressly remarks:—"Those who may look into this book are warned that they will not find a complete treatise on Ornithology, any more than an attempt to include in it all the names under which Birds, even

the commonest, are known. Granted that a complete treatise is not to be expected in a Dictionary, we cannot concede that a Dictionary is not to be as perfect as its author can make it, and no one who has referred to Professor Newton's articles in the 'Encyclopædia Britannica' will doubt for a moment his ability to supply many additions and improvements. It is to be regretted that he has not seen his way to this. The increased bulk and cost of each Part which would be thereby necessitated, would, we opine, be quite immaterial to readers who have felt the want of such a work.

As regards what we have ventured to call "improvements," we allude to the desirability of finding more references to other sources of information outside the Dictionary, and which after all is one mode of economising space. To take the word *Abadavine* on the very first page. We read "ABADAVINE or ABERDUVINE (etymology and spelling doubtful); a name applied in 1735 by Albin (Suppl. Nat. Hist B. p. 71) to the Siskin, but perhaps hardly ever in use, though often quoted as if it were." Here we miss the more familiar spelling *Aberdavine* and *Aberdevine*; and it would have been of interest to add that this name, though not mentioned by Willughby, is used by Gilbert White in his eighth letter to Daines Barrington, and by Montagu in a letter to White, May 21st, 1789. Again, we find "BARLEY-BIRD, a name given in some parts to the Yellow Wagtail, in others to the Wryneck; but in both cases from their appearing at the time of barley sowing. By some authors it is said, but obviously in error, to be applied to the Siskin." But see Willughby, Orn. p. 261. The Yellow Wagtail and the Wryneck do not usually arrive until about the 7th of April, while barley is generally sown in February and March.

To the statement (p. 78) that "Carr-goose is an old name for the Great Crested Grebe" might be added "and is still used in Staffordshire (Garner)." *Apropos* of Grebe (p. 381), the suggestion that this is from the French *Grèbe* is, we venture to think, doubtful. The bird is said to derive its name from its crest, Cornish and Welsh *crib* and *criban*, a comb, or crest (Skeat). As for its provincial name "Gaunt" (p. 310), which Prof. Newton considers may be "possibly corrupted from Gannet," he might have referred to a note on this subject (Zool. 1884, p. 350), in which a very different and plausible explanation is suggested.

We cannot always agree with Prof. Newton in his suggested etymologies. Take the word "Daker-hen," for example, a provincial name for the Corncrake or Landrail.* He will have it (p. 131) that it refers to the unsteady flight of the bird—though it is no more unsteady than that of the Moorhen, Water-rail, Spotted Crake, and other short-winged ralline forms—for he says "to dacker" (Frisian *dakkern*, M. Dutch *daeckeren*) is in use in Lincolnshire, and signifies to stagger, totter, or hesitate. But surely "daker-hen" is merely "t'acre-hen," the north country pronunciation of "the acre hen," cognate with the Scandinavian *ager hōna*, that is "field-hen." See 'The Zoologist,' 1883, p. 229.

When noticing the supposed derivation of the name Bustard (p. 62), reference might have been made to the statement of Dr. Muffett that these birds are

"So called for their slow pace and heavy flying, or as the Scots term them, *gusetards*,† that is to say, slow geese." He adds the interesting remark that "in the summer, towards the ripening of corn, I have seen half a dozen of them lie in a wheatfield fattening themselves (as a deer will doe) with ease and eating, whereupon they grow sometimes to such a bigness, that one of them weigheth almost fourteen pound."—'Health's Improvement,' 4to, 1655, p. 91.

Dr. Muffett, whose book was published long after his death, which took place in 1590, was a pensioner of the Earl of Wilton, and lived at Bulbridge in Wiltshire. This curious testimony to the abundance of the Bustard in Wilts in the time of Elizabeth, has been generally overlooked by writers on British Birds, even by the author of 'The Birds of Wiltshire,' wherein, nevertheless, an excellent account of this species is given. *Apropos* of Bustards, it may be noted that the statement (p. 65) to the effect that Macqueen's Bustard "has occurred once even in England," now requires modification, since a second example has recently been procured on the Yorkshire coast (Zool. 1893, p. 21), though probably this had not been recorded at the time the article "Bustard" in this Dictionary' had been passed for press. We note it in view of a forthcoming second edition.

* It is to be found mentioned in Merrett's 'Pinax,' 1667, where it is quoted as a Northumbrian name (p. 183).

† So called by Hector Boece in 1527, and Bishop Leslie in 1578.

“Galley-bird,” we are told (p. 299), is “given as a Sussex name for a Woodpecker by Mr. Charles Swainson (Prov. Names Br. B. pp. 99, 100), but not mentioned as such by Mr. Borrer, or Mr. Knox.” Upon this we may remark that in Sussex, as well as in Kent, the names “Galley-bird” and “Gallows-bird” are applied to the Green Woodpecker, and are noted for that species in Parish’s ‘Dictionary of the Sussex Dialect.’

Apropos of the Woodpeckers, and the note on “French Pie” (p. 292), it may be observed that Mr. Borrer, in his ‘Birds of Sussex,’ writing of the Greater Spotted Woodpecker, says, “I am not aware that it has any local name;” but in both Sussex and Hampshire we have heard gamekeepers and beaters call it “French Magpie,” a name by which it is also known in Devonshire and Staffordshire (Garner), though in other counties this name is bestowed upon the Grey Shrike, the *Pie grièche* of the French (Zool. 1893, p. 311). Izaak Walton, in enumeration of the birds used by the falconer, *Auceps*, mentions the French Pie, which in his case, of course, was the Grey Shrike, employed by falconers as a sentinel (*excubitor*) to give warning of the approach of a wild hawk. The mode employed is referred to (p. 66) under the head of “Butcher-bird,” as being “well described by Hoy” (Mag. Nat. Hist. iv. p. 342); but for accuracy of description with illustrations, and fulness of detail, we venture to assert that this account is not to be compared with that given in ‘The Field’ of March 16th, 1878, and reprinted in ‘Essays on Sport and Natural History,’ 1883 (pp. 117–128). Similarly, under the heading “Cormorant,” we are referred (p. 106, note) to “Capt. Salvin’s chapter on ‘Fishing with Cormorants,’ appended to his and Mr. Freeman’s ‘Falconry’ (London, 1859).” But on this subject also a very much fuller account, and more complete because embodying a history of the introduction of this sport into England, is to be found in the same volume of ‘Essays’ just referred to, an account which Capt. Salvin himself has characterised in ‘The Field’ as “a very complete history and exact description of the sport.” These ‘Essays’ are only alluded to here for the purpose of showing that the author of the ‘Dictionary of Birds’ does not always refer his readers to the fullest printed accounts of particular subjects.

We are sorry to see (p. 237) the repetition of what we regard as an utter fallacy, that falcons are useful in destroying game-

birds "that show signs of infirmity." We are of course aware that this statement has long become stereotyped; but we have seen such numbers of grouse and partridges killed by trained falcons, that we have no hesitation in saying that a Peregrine can knock down any bird it pleases with the greatest ease, and will stoop at the first bird of a covey which it catches sight of, quite regardless of whether it is the strongest or weakest. Of this fact we have been often an eye-witness. We may add that this was long ago demonstrated by Lieut.-Col. Delmé Radcliffe and by Col. Whyte. (See 'The Field,' 18th April, 1863).

Having thus indicated some of the names which in our opinion ought not to have been omitted from the 'Dictionary,'—some of which, like "Attagen," "Beccafigo," and "Berkut," are really important,—we will devote a few lines to a consideration of some that might well have been dispensed with. Amongst these we would place "Chacalaca," "Chok," "Curucui," "Corrira," "Fasceddar," and "Kalkoentje." These, and several others that might be mentioned, are not accepted English words, and, as it seems to us, stand upon a different footing to such names for instance as "Caracara," "Huia," and "Jacana," which, though introduced words, are generally recognized and frequently used. Moreover, if the names in question are to be admitted, why exclude "Arapunga," "Boclora," "Cuia," "Houtou," "Ibibirou," and other native names to be found in Waterton's 'Wanderings in South America'? At the same time we are far from saying that it would not be a most useful piece of work to identify the birds whose scientific names were persistently ignored by the English wanderer in Demerara.

One other shortcoming we have to notice, namely, the desirability of having more cross references. Of this a single example will suffice. There is a curious bird frequenting the east coast of Africa, from the Red Sea to Natal, as well as the northern and eastern shores of the Indian Ocean, the Bay of Bengal, and many of the intervening islands. To all scientific ornithologists it is known as *Dromas*, yet this name is not in the Dictionary, though we find the bird dealt with under the familiar Anglo-Indian name, "Crab-plover." Here the insertion of the words "Dromas, see Crab-plover," would have been useful. Add also "Chionis, see Sheathbill."

And now having pointed out a few instances in which, as it

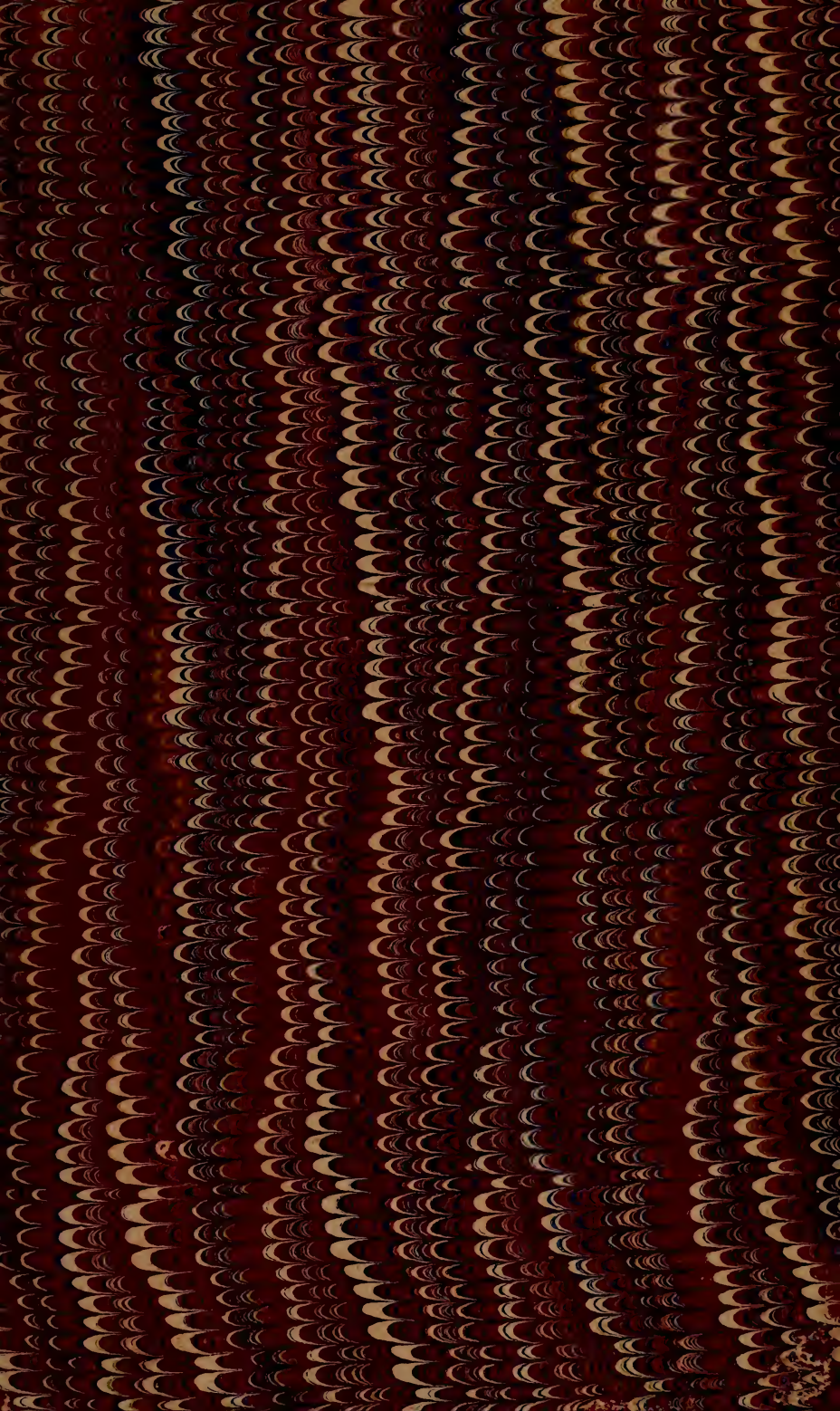
seems to us, there is room for emendation, let us refer to some of the merits of the work, which far outweigh the faults,—if such they may be called,—to which we have directed attention. There are many articles of an encyclopædic character, of the value of which it would be impossible to speak too highly. They are full of information, clearly and concisely written, and so far as they go extremely accurate. What more can be said? We would especially refer to the articles, Anatomy, Brain, Digestive System, Eggs, Embryology, Extermination, Feathers, Fossil Birds, Geographical Distribution and Migration; and as regards particular species, to Avocet, Bird of Paradise, Bustard, Crane, Dodo, Emeu,* Gare-fowl, Lark, and Megapode, all admirable examples of accurate and condensed information.

Professor Newton has been singularly fortunate in his coadjutors, and their names as given on the title-page, above quoted, are a sufficient guarantee of the value of their contributions. In particular we would remark that Mr. Lydekker's article on Fossil Birds has supplied a gap in ornithological literature which has long been too apparent; while the contributions on Anatomy and Physiology by Dr. Gadow, and on Osteology by Dr. Shufeldt, leave nothing to be desired.

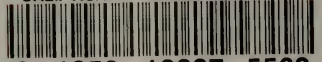
As regards the illustrations, they are for the most part excellent; and we are glad to notice the reproduction of Swainson's woodcuts of heads and feet, which have been too generally overlooked, and which for accuracy have seldom been surpassed. We look forward with pleasurable anticipation to the publication of the two Parts with which the work is to be concluded.

* We may take exception here to the statement (p. 214) that "the Emeu is the only form of Ratite bird which naturally takes to the water;" for we have it on the authority of Darwin and Dr. Cunningham that this habit has been observed in the American Rhea. See 'Ostriches and Ostrich-farming,' p. 58. Nor is it quite correct to say (p. 80) that it is the custom of the Ratitæ for the eggs to be invariably incubated by the male birds. See 'Nature,' March 22nd, 1883. One other criticism with reference to Ostriches may be here advanced. It is stated (p. 190, note) that "it is curious that Ostriches' eggs from North Africa are to be readily distinguished from those from the Cape of Good Hope by their smooth ivory-like surface without any punctures, whereas southern specimens are rough as though pock-marked; yet no other difference that can be deemed specific has as yet been established between the birds of the north and of the south." The explanation of this difference in the surface of the egg-shells is said to be that the eggs of the North African Ostrich brought to this country are usually procured from the Arabs, whose practice it is to get rid of the rough surface, and as they think improve the appearance of the eggs by rubbing and polishing them between their hands with sand! But see Tristram, 'Ibis,' 1860, p. 74.





CALIF ACAD OF SCIENCES LIBRARY



3 1853 10007 5568