

bird the name *intermedia*, had no right to withdraw this name in favour of *elliotti*.

Coues (Auk, xiv. p. 275) says :—"There is probably another change required in our nomenclature of this genus ; certainly so, if, as some think, *M. g. elliotti* of Sennett, 1892, is synonymous with his *M. g. intermedia* of 1879."

There can be no question about these names being synonymous ; Sennett clearly states that they are so, and both were founded on Rio Grande birds.

Mr. Nelson's *M. g. merriami* is also merely a synonym ; but by contrasting his birds with examples of *M. gallopavo* (= *mexicana* Nelson) and *M. americana* (= *fera* Nelson) he would have us suppose that his "new subspecies" is very distinct. A comparison with *M. intermedia* (= *gallopavo* Nelson), with which his birds are obviously synonymous, is avoided [*cf.* Auk, xviii. p. 310 (1901)].

2. MELEAGRIS AMERICANA (Cat. B. xxii. p. 389).

The Turkey question was discussed at some length by Dr. Coues in 1897 [Auk, xiv. pp. 272-275 (1897)].

Taking the 'Catalogue of Birds' he goes through all the older synonyms given there under the heading *Meleagris americana*. These names are as follows :—

Gallopavo sylvestris Catesby, Carol. i., App. p. xlv (1730) ;
Brisson, Orn. v. p. 162 (1760).

Meleagris americana Bartram, Trav. p. 290 (1791) [Pennsylvania].

Meleagris palawa Barton, Med. & Phys. J. ii. pt. i. pp. 163-164 (1805) [United States].

Meleagris silvestris Vieill. N. Dict. d'Hist. Nat. ix. p. 447 (1817).

Meleagris fera Vieill. Gal. Ois. ii. p. 10, pl. 201 (1825).

Coues states his reasons for rejecting the older names, but does not suggest which name, if any, should be substituted for *M. americana*. In 1899 (Auk, xvi. p. 77) he rectifies his previous omission and proposes the name *Meleagris gallopavo fera*. He also remarks "there occurs on p. 274 the typographical error of *pera* for *fera* in citing the Gal. Ois. ii.

1825, p. 10, pl. 201, and I inadvertently used the term *sylvestris* instead of *fera* in citing the *Nouv. Dict. d'Hist. Nat.* ix. 1817, p. 447."

It is a self-evident fact that Coues never looked up Vieillot's original reference, as, had he done so, he would have found "*silvestris*," as cited above.

Finally, Mr. Elliot puts the finishing touch to this statement (*cf.* *Auk*, xvi. p. 231). He writes:—"In the same number of 'The Auk' the name for our northern Turkey has been correctly given as *M. fera* Vieill., *Nouv. Dict.* 1817, p. 447, and not *M. silvestris* Vieill. as given by me in 'Game-Birds.' It may be interesting to state how I came to adopt that name, as Vieillot never described any Turkey as *sylvestris* There was no copy of the 'Nouv. Dict.' available, and I could not delay the printer until I should be able to consult it, so, perforce, contrary to my established custom in such cases, I accepted the citation given in the *B. M. Cat. Birds*, xxii. p. 389, as correct, and was thus led astray." !!

This inaccurate statement needs no further comment.

I cannot see any objection to the employment of Bartram's name *M. americana*, for, though he gives no description, the name has been much used and can only refer to the Pennsylvanian bird. The only alternative is to use *Meleagris silvestris* Vieill.

1. *DENDRORTYX MACROURUS* (op. cit. p. 392).

Dendrortyx oaxacæ Nelson, *Auk*, xiv. p. 43 (1897) [♂, Totontepec, Oaxaca, Mexico].

Dendrortyx macrourus griseipectus Nelson, t. c. p. 44 [♂, Huitzilac, Morelos, Mexico].

Dendrortyx macrourus striatus Nelson, t. c. p. 44 [♀, Chilpancingo, Guerrero, Mexico].

Dendrortyx macrourus dilutus Nelson, l. c. xvii. p. 254 (1900) [Patzcuaro, Michoacan, Mexico].

On apparently only four specimens of *Dendrortyx*—three males and a female from Oaxaca, Morelos, Michoacan, and Guerrero respectively.—Mr. Nelson has founded as many new species and subspecies.

In company with Mr. F. D. Godman, I have very carefully read Mr. Nelson's descriptions and remarks, and have re-examined the specimens in the British Museum. Our series of *D. macrurus*, though small, is apparently more than twice as large as that at Mr. Nelson's disposal, and seems to shew beyond doubt that his supposed species and subspecies are untenable, and that the differences pointed out between the individuals have no geographical significance.

2. *LOPHORTYX GAMBELI* (Cat. B. xxii. p. 403).

Callipepla gambeli deserticola Stephens, Auk, xii. p. 371 (1895) [Colorado Desert, California].

Callipepla gambeli fulvipectus Nelson, Auk, xvi. p. 26 (1899) [Rio Mayo, Sonora, Mexico].

Of the first of these subspecies the Museum possesses typical male examples collected by Mr. Stephens himself in the Colorado Desert; of the second we have a female example from Hermosillo, Sonora. I am unable to see any reason whatever for separating these birds from typical *L. gambeli*.

LOPHORTYX LEUCOPROSOPON Reichenow, Orn. Monatsb. iii. pp. 10 and 97, woodcut, ♂ ♀ (1895); Grant, Handb. Game-Birds, ii. p. 295 (1897).

This name was given by Dr. Reichenow to birds bred in captivity from parents of unknown origin. As suggested by him, the parents were probably hybrids, possibly between *Lophortyx californicus* and *Eupsychortyx cristatus*.

LOPHORTYX BENSONI Ridgw.; fide Sharpe, Hand-list Birds, i. p. 44 (1899) [Sonora].

I can find no published description of this species.

1. *OREORTYX PICTUS* (op. cit. p. 397).

Oreortyx pictus Ridgway, Auk, xi. pp. 193-196, pl. vi. (1894); Grant, Ibis, 1894, p. 570.

After the remarks on the sexual and geographical variations of this species that have already appeared in the 'Auk' and 'Ibis' (*vide supra*), I am surprised to see that in the 'Hand-list of Birds' [i. p. 44 (1899)] no less than three species of

Mountain Partridge are admitted:—1. *Oreortyx pictus* (Dougl.); 2. *O. plumiferus* (Gould); and 3. *O. confinis* Anthony.

3. *EUPSYCHORTYX SONNINI* (op. cit. p. 409).

Eupsychortyx pallidus Richmond, P. U. S. Nat. Mus. xviii. p. 657 (1896) [Margarita I., Venezuela].

This species is said to be “considerably paler” than *E. sonnini*.

Mr. Richmond admits having very scanty material for comparison (one male and one female). In a series of typical birds from Quonga, British Guiana, collected by H. Whitely, considerable variation is found in the plumage, some being much paler on the breast and some darker. This species was introduced into Mustique Island, Grenadines, W.I., about 1885, and there is a male in the British Museum collection procured on that island by D. W. Smith. It is very likely to have been introduced into Margarita Island. In any case the description does not lead one to believe that Mr. Richmond has much faith in the validity of the species; and, after re-examining our specimens from British Guiana, I have no hesitation in regarding *E. pallidus* as a synonym of *E. sonnini*.

COLINUS Less. Man. d’Orn. ii. p. 190 (1828) must stand in place of *Ortyx* Steph. in Shaw’s Gen. Zool. xi. p. 376 (1819) [nec Oken, Lehrb. Nat. iii., Zool. pt. ii. p. 611 (1816): type, *Turnix sylvaticus* (Desf.)]*.

1 B. *ORTYX VIRGINIANUS* subsp. *b. TEXANUS* (op. cit. p. 419).

Colinus virginianus maculatus Nelson, Auk, xvi. p. 26 (1899) [from Tancanhuitz, San Luis Potosi, north to Victoria, and Jaumave Valley, Tamaulipas, Mexico].

* [We fail to see why “*Ortyx*,” which has, until recently, been the title of this well-known group, should be superseded by *Colinus*. It is the fact that “*Ortyx*” was casually mentioned by Oken in his ‘Lehrbuch’ as a synonym of *Turnix*, but it does not seem at all certain that Oken meant to propose “*Ortyx*” as a new generic term. At any rate it has never been used in place of *Turnix*. Let us give “*Ortyx*” the benefit of the doubt.—EDD.]

We have a series of birds from the area indicated, and Mr. Godman and I are both satisfied that Mr. Nelson's name is a mere synonym of the subspecies *C. texanus*.

2 A. *COLINUS GODMANI* Nelson, Auk, xiv. p. 45 (1897) [Jaltipan, Minatitlan, Coatzacoalcas, and shores of Lake Catemaco, Vera Cruz, Mexico]; xv. p. 120, pl. ii. (1898).

This species has nothing to do with *C. graysoni* Lawr., with which Mr. Nelson compares it; but is evidently nearly allied to *C. cubanensis*. The male appears to differ from that species chiefly in having the crown blackish, with brown and greyish edgings to the feathers; the sides, flanks, and belly chestnut, heavily margined with black *and devoid of white spots*; and the tertials spotted with white instead of buff.

The figure is somewhat misleading, as it conveys the impression that the entire belly is black; but we find from the description that this is not the case.

3. *ORTYX PECTORALIS* (Cat. B. xxii. p. 421).

Colinus graysoni nigripectus Nelson, Auk, xiv. p. 47 (1897) [Plains of Puebla, Mexico].

Colinus minor Nelson, Auk, xviii. p. 47 (1901) [Plains of Chiapas, near Palenque, and adjacent parts of Tabasco].

In the British Museum collection there are male examples of this species with the feathers of the under parts either uniform chestnut or narrowly fringed with black. The latter plumage apparently denotes the fully adult bird [*cf.* remarks on *C. salvini*, *infra*].

In my opinion there can be no doubt that both these names of Mr. Nelson's are synonyms of *C. pectoralis*. By almost invariably contrasting his supposed new birds with the species to which they are least nearly allied, "old friends" are made to appear in the guise of very distinct species. We cannot imagine that so excellent a field-naturalist as Mr. Nelson does this wilfully, and must therefore infer that such errors are due to insufficient knowledge of the subject and want of material. By referring to the various "Keys to the Species" given in the 'Catalogue of Birds,' xxii., Mr. Nelson would have escaped such absurdities as redescribing *Cyrtonyx sallæi*

under the name of *C. merriami*, and comparing it with *C. montezumæ* !! [vide *infra*].

5 A. *COLINUS INSIGNIS* Nelson, Auk, xiv. p. 46 (1897) [Valley of Comitan, Chiapas, and Nenton, Guatemala].

The British Museum possesses a series of this species collected by W. B. Richardson at Comitan and in the Chiapas Plains in May 1897. The females agree perfectly with the description of the type female given by Mr. Nelson: the *males*, which have never been described, very closely resemble the males of *C. ridgwayi* Brewst.; but the plumage is throughout darker, the mantle and under parts are dark chestnut instead of pale chestnut, and the black on the chin and throat extends somewhat further down the fore-neck.

7 A. *COLINUS SALVINI* Nelson, Auk, xiv. p. 45 (1897) [Tapachula and San Benito, Chiapas, Mexico].

We have a series of this species from San Benito. It is most nearly allied to *O. atriceps* Grant, from W. Mexico, but the male has the upper parts much darker and almost devoid of rufous markings, the chestnut which forms an ill-defined collar in *O. atriceps* on the nape and upper mantle being replaced by black, while in *most specimens* the dull chestnut feathers of the breast and belly are margined with black; *it should be noted, however, that in some males the black margins are indistinct or even absent*. These are perhaps immature birds. The female is much darker than the female of *O. atriceps*, and has the ground-colour of the under parts white instead of buff.

1. *CYRTONYX MONTEZUMÆ* (op. cit. p. 425).

Cyrtonyx montezumæ mearnsi Nelson, Auk, xvii. p. 255 (1900) [South-western Texas and the southern half of New Mexico and Arizona, ranging into N. Mexico].

We have examined a number of examples of this supposed subspecies, but neither Mr. Godman nor I have been able to see the slightest ground for separating it; the differences mentioned in the description, so far as we can see, have no real existence.

Mr. Nelson thinks that he has discovered that the *Odontophorus meleagris* Wagl. [cf. Isis, 1832, p. 278 (not p. 277 as stated in the Cat. Birds and copied by Nelson) is a species distinct from *C. montezumæ*.

He says:—"This Partridge (*C. merriami*) appears to be closely related to *Odontophorus meleagris* Wagler (Isis, 1832, p. 277), but differs in having the white spots of the flanks on a background of ashy gray instead of black. Like that species it lacks the white collar on the neck, which in *O. montezumæ* separates the black of the throat from the chestnut of the breast. Heretofore *O. meleagris* has been placed as a synonym of *O. montezumæ*, but the discovery of *C. merriami* with the same general style of markings given for *O. meleagris* indicates that the latter is probably a well-marked species which has failed of recognition through lack of material. It was described from Mexico and should take its proper place in ornithological literature." Now there cannot be the slightest doubt that *O. meleagris* Wagl. is a mere synonym of *C. montezumæ*. Either Mr. Nelson has not read Wagler's description or has failed to understand it. Wagler very clearly states that his bird has a white collar, for he writes: "fascia colli inferioris sericeo-alba." One can easily understand his describing the ground-colour of the flanks as black, for in some specimens they are dark greyish black.

2. *CYRTONYX SALLÆI* (Cat. B. xxii. p. 427).

Cyrtonyx merriami Nelson, Auk, xiv. p. 48 (1897) [East slope of Mt. Orizaba, Vera Cruz].

There can be no doubt that *C. merriami* is a synonym of the beautiful species described in 1859 as *C. sallæi*. The apparent absence of the white collar on the fore-neck dividing the black throat from the chestnut is probably partly due to the make of the skin, but in this species the white collar is always narrow and in one specimen before us is nearly wanting.

1. *DACTYLORTYX THORACICUS* (op. cit. p. 429).

Dactylortyx thoracicus lineolatus (Gould) Nelson, Pr. Biol. Soc. Washington, xii. p. 66 (1898).

Dactylortyx chiapensis Nelson, *ibid.* [San Cristobal, Chiapas, and Santa Maria, Guatemala].

Dactylortyx devius Nelson, t. c. p. 68 [Forests of Western Jalisco].

With apparently only eight specimens of *Dactylortyx* available for comparison Mr. Nelson gives us a revision of this genus. He distinguishes three species and one subspecies, as follows :—

Dactylortyx thoracicus (Gambel). Two females examined, one being Gambel's type.

Dactylortyx thoracicus lineolatus (Gould). One male examined.

Dactylortyx chiapensis, sp. n. Four specimens, males and females, examined.

Dactylortyx devius, sp. n. One male examined.

Along with Mr. Godman, I have again examined the series of 23 specimens in the British Museum, and, after carefully going over Mr. Nelson's work, we can see no reason for recognising more than one species. All Mr. Nelson's "species" are to be found in the series from Guatemala alone. Specimens from Northern Yucatan are somewhat smaller and lighter in colour than those from other parts of Central America, but they do not appear sufficiently different to merit a distinct name, and in any case our series, a male and two females, is insufficient to decide the question.

1. ODONTOPHORUS GUIANENSIS subsp. *a.* MARMORATUS (Cat. B. xxii. p. 433).

Odontophorus castigatus Bangs, Auk, xviii. p. 356 (1901) [Chiriqui].

Mr. Bangs, in pointing out the distinctive characters between his *O. castigatus* and *O. marmoratus* (Gould), says that in the latter the top of the head is *light chestnut*; but I have again examined Gould's type from Bogota and can assure him that this is not the case. The top of the head is dark brown; and our specimens from Chiriqui, though not perfectly adult, are undoubtedly of the same species as the birds from the United States of Colombia.

4 A. ODONTOPHORUS ATRIFRONS.

Odontophorus atrifrons Allen, Bull. Amer. Mus. xiii. pp. 127-128 (1900).

Hab. Valparaiso, Sierra Nevada, U.S. Colombia, 4500-5500 feet.

This appears to be a distinct species most nearly allied to *O. parambæ*, which has been procured in Northern Ecuador and in Antioquia, U.S. Colombia. Certain parts of the description seem, however, to suggest that the bird under consideration may not be fully adult. Dr. Allen writes :—"The scapulars with the inner vanes black, broadly barred and edged with chestnut, *with light shaft-stripes*, and central portion of outer vane gray; upper breast similar to the mantle (olivaceous gray, vermiculated with black), but varied slightly with buffy white, which takes the form of *ill-defined apical spots* on the lower border of this area; lower breast ochraceous rufous, with indistinct cross-bars and shaft-stripes of black."

4 B. ODONTOPHORUS PARAMBÆ.

Odontophorus parambæ Rothsch. Bull. B. O. C. vii. p. vi (1898); Hartert, Nov. Zool. v. p. 505, pl. iii. fig. 1 (1898).

Hab. Paramba, N. Ecuador; Antioquia, U.S. Colombia.

10. ODONTOPHORUS GUTTATUS (Cat. B. xxii. p. 439).

Odontophorus consobrinus Ridgw. P. U. S. Nat. Mus. xvi. p. 469 (1893) [Mirador, Vera Cruz, Mexico].

Mr. Ridgway's supposed species is unquestionably founded on two females specimens of *O. guttatus* (Gould) and was correctly placed under the synonymy of that species in the Cat. B. Brit. Mus. xxii. p. 439 (1893).

CRAX SULCIROSTRIS Goeldi, Boll. Mus. Paraense, iii. no. 4, p. 409.

The description (translated) reads as follows :—

"A female which is of the same size as the preceding species (*C. carunculata*). A broad groove runs on each side of the beak from the nasal fossa to near its point. The tarsi resemble those of the preceding species, but are covered in

front with 11 or 12 scutes. The feathers from the front of the vertex to the nape are black, with two broad white bands in the middle. The neck and the head are black. The back and the wings are black, with numerous transverse white lines. Some of these lines are visible on the median rectrices, whilst others are uniform black, all turning to white towards the point. The breast, the lateral parts of the body, and the legs are yellowish, with broad, transverse, black bands; the belly and the under tail-coverts are uniform yellowish. The wing measures 34, the tarsus 10 centim.

“Mus. Paul. Est. de S. Paulo.”

This is apparently based on a female of *Crax pinima*. The description of the plumage agrees almost exactly with that of specimen “c” in the British Museum Collection, described [*cf.* Cat. B. Brit. Mus. xxii. p. 447 (1893)] as “*a second and apparently less mature specimen.*” The groove on the bill is probably accidental and of little importance.

16. *ORTALIS CINEREICEPS* (Cat. B. xxii. p. 515).

Ortalis struthopus Bangs, Pr. New Engl. Zoöl. Club, iii. p. 61 (1901) [Arch. de las Perlas, Bay of Panama].

The birds from the Archipelago de las Perlas are separated from typical *O. cinereiceps* (Gray) on account of their “*very much smaller and weaker*” foot and tarsus. The measurements given are as follows:—

	Tarsus.	Middle toe and claw.
	in.	in.
<i>Ortalis struthopus</i> , ♂	2·32	2·74
“ “ ♀	2·02	2·22
<i>Ortalis cinereiceps</i> , ♂	2·52	3·08
“ “ ♀	2·36	2·56

This difference in size (which, as shown by our series, has no real existence) is, we venture to think, hardly sufficient to entitle the birds from the Archipelago de las Perlas to specific or even subspecific rank.

XVI.—*A Month on the Eddystone: a Study in Bird-migration.* By WILLIAM EAGLE CLARKE, F.L.S. &c,

FOR many years past I have annually made peregrinations to favourably situated localities, both at home and abroad, during spring and autumn, for the purpose of observing the migratory movements of birds. The practical experience thus gained has been of incalculable value to me in the preparation of the various Reports which I have from time to time submitted to the British Association on the subject of Bird-migration in Great Britain and Ireland.

Varied as to time and place and withal successful as these numerous expeditions have been, yet until 1901 I had practically failed to obtain satisfactory knowledge, by direct personal observation, as to one of the most important phases of the phenomenon—namely, that of emigration. That this should have been the case is not difficult to realize when it is remembered that emigration is the movement of all others which is performed under conditions of obscurity. Thus it is chiefly—and entirely in the case of the majority of species—undertaken during the hours of darkness, so that it escapes the notice of all save those few peculiarly placed observers, the light-keepers; and even they, however watchful they may be, witness a mere fraction of the movements that actually take place in close proximity to their stations, for it is only under certain meteorological conditions that the migrants seek the beacon's light and reveal themselves to the watcher, if there be one ready to watch.

I therefore determined, if possible, to spend a month in such a station for the purpose of perfecting my experience in what has long been a favourite study, and in the belief that a trained observer, prepared to devote the whole of his time to the necessary vigils, might, even in so short a period, during the height of the migratory season, add considerably to the knowledge of these important movements.

It required but little consideration to decide that autumn was obviously the best season, that the south coast of England was the best section of our littoral on which to

witness the departure-movements from Britain, and that an ideal watch-tower would be one situated well out in waters of the English Channel, for there the birds could be observed actually *en route* from our Islands to their southern winter-quarters, and there, too, the movements would be free from the complexities, due to coasting-propensities, so common to birds at most land-stations. The famous Eddystone Lighthouse offered all these advantages.

On making known my project to Professor Newton, he, with his characteristic kindness, at once offered his valuable assistance, with the result that, through his instrumentality and that of Sir Michael Foster, my application for permission to reside in the Lighthouse was forwarded to the Trinity House by, and with a strong recommendation from, the Royal Society. The request was most graciously granted by the Elder Brethren, and I took up my residence on the Eddystone on the 18th of September last and remained there until the 19th of October.

Life on a rock-station has, of course, its little trials. He who seeks to dwell therein must, among other things, be prepared to share in all respects the lot of the keepers, and also to be shut off from communication with the outer world until the monthly "relief" comes round, when, weather permitting, his incarceration ends and he returns to the ordinary comforts of everyday life. I may say at once, however, that the novelty of the situation, the interesting nature of my self-imposed work, and last, but not least, the great kindness of the keepers, far outbalanced those little discomforts which are inseparable from such a life; and I shall ever look back upon my sojourn in that lonely observatory with extreme pleasure and satisfaction.

The Eddystone rocks consist of three contiguous reefs, which lie fourteen miles south-west of Plymouth. The central reef is the most extensive, its exposed length at low water being some 150 yards, while its jagged crest then rises about 15 feet above the sea. At high water all the rocks are either submerged or have their highest points awash. The lighthouse stands isolated at the northern extremity of the

main reef, and is a massive structure 168 feet in height. The gallery, which was the scene of my perambulations and vigils, is 130 feet above the sea. The illuminating apparatus consists of a double series of dioptric lenses, one placed above the other, each furnished with a six-wick lamp, and develops the enormous power of 80,000 candles. In clear weather, however, only one lamp is used, full power being burnt when the Breakwater Light at Plymouth, eleven miles distant, is invisible. The light is concentrated into twelve brilliant beams, arranged in pairs, which revolve slowly, taking three minutes to make a complete circuit. On the adjacent reef to the north, and about forty yards distant, stands the basal portion of Smeaton's historic tower, erected in 1758 and in use down to 1882, a memorial to the genius of the founder of the science of lighthouse-engineering.

Landing on the rock is somewhat exciting work, and is effected from a surf-boat towed out by the relief steamer for the purpose. This boat approaches the rock at low water, and anchors some little distance off the lighthouse, while those landing have to dangle from a loop in a rope, clinging to the same with their hands as they pass over the intervening surf, the rope being paid out from the boat and hauled up by the winch in the lighthouse. The only real difficulty about this novel method of landing is to get nicely clear of the bow of the boat, and to avoid dropping into the water when the order "heave away" is given to the men at the winch.

As I anticipated, I found the Eddystone to be favourably situated for observing emigration, and, though it is probably only one among many points at which the Channel is crossed by birds on passage, yet its geographical position must be regarded as somewhat exceptional, since many migrants which have travelled along the west coast of Britain doubtless proceed further south in its proximity. The waters of the Channel in the longitude of the Eddystone—*i. e.* between the easternmost point of the south coast of Cornwall and the westernmost part of Brittany—are 115 miles in width.

The amount of success which it was possible to achieve

during my visit was dependent to an extraordinary degree upon the weather. This was especially the case as regards night movements ; for it must be borne in mind that conditions which are eminently favourable for migration may be, and indeed in most cases are, quite unfavourable for its observation. Successful night observation I found to be entirely dependent upon a combination of meteorological conditions which, while being favourable for emigration, also rendered the lantern attractive to the migrants—a combination which, though not very uncommon, is yet one of which the comparative infrequency results in the great majority of movements being unobserved. The lantern of a light-station is simply a decoy. It is one that I found to “work” only under peculiar conditions, which were dependent upon the amount of moisture (rain, haze, cloud) present in the atmosphere. When moisture is disseminated through the air as a liquid in a state of minute subdivision, the mixture becomes more or less opaque, while the powerful beams streaming out from the lantern upon it become luminous and brilliant to a very remarkable degree, and exert extraordinary attractive powers over the migrants that pass within their sphere of influence. On such occasions the twelve slowly revolving rays from the Eddystone lantern presented a very singular and mystifying appearance, and small wonder was it that the emigrants could not resist their seductions.

My visit included a period when the nights were brilliantly moonlit and cloudless, during which, no doubt, great passage-movements were performed, but they were beyond the range of observation. Gales were not infrequent and arrested emigration.

The first emigratory movement performed during the hours of darkness which I was to witness set in at 3 A.M. on September 23rd. I say “set in,” because just previously to its advent the weather was of such a description as to render migration impossible, owing to the prevalence of a southeasterly gale with a velocity of from 40 to 48 miles an hour.

Just before the time named, however, the wind fell to a moderate breeze, but the heavy rain still continued. Almost immediately after the wind moderated, the birds appeared in numbers, and the scene from the gallery was very remarkable. The birds were flying around on all sides, and those illumined by the slowly revolving beams from the lantern had the appearance of brilliant glittering objects, while the rain shot past on either hand, as I stood on the lee side, like streams of silver beads. I was not a little disappointed to discover how extremely difficult it was to identify the birds seen under such novel and peculiar conditions. Even the conspicuous spots on the breasts of the Song-Thrushes as they flew in the beams towards the lantern were entirely effaced by the dazzling brilliancy of the light, and the smaller species had to be lifted from the lantern ere their identity could be ascertained; while the birds careering around became mere apparitions on passing the rays into the semi-darkness beyond. A number of species undoubtedly escaped detection; but the following are known to have participated in the movement, those marked with an asterisk (on this and other occasions) having been either killed or captured:—Song-Thrushes, *Redstarts, *Sedge-Warblers, *Pied Flycatchers, *Yellow Wagtails, Turtle-Doves, Redshanks, and Curlews. The Song-Thrushes, Yellow Wagtails, and Turtle-Doves were most in evidence.

The Turtle-Doves were a great puzzle; for though they often approached the lantern, yet they recovered themselves sufficiently to avoid striking it, and it was not until day-break, when one was observed resting on the top of Smeaton's tower and another on the dome of the lighthouse, that the mysterious strangers stood revealed. The Yellow Wagtails captured included both adults and young.

The birds which struck the lantern did so after travelling directly up the beams of light; but a number of them flew high and passed over the dome. The emigrants came from the north and continued to arrive and pass on until 5 A.M., but before the appearance of dawn the movement ceased.

This rush was evidently composed of departing British

summer visitors, spurred to move southwards by the very unsettled weather of the previous few days. I witnessed no second movement of a precisely similar nature, though, no doubt, other flittings away of our summer birds followed; but the nights were brilliantly fine, and the migrants passed southwards unobserved. On this occasion the lantern was attractive to the birds by reason of its rays being rendered unusually luminous as they streamed out on the heavy rain which prevailed.

This movement was followed by several minor emigrations: that is to say, they were less important so far as they came under observation.

On September the 30th, at 9.30 P.M., following a lifting of fog (wind E.S.E., moderate breeze, hazy), *Song-Thrushes, *Meadow-Pipits, *Chaffinches, and other undetermined species appeared. The movement ceased to be observed on the appearance of the moon at 10.45 P.M.

October 1st.—Numbers of *Meadow-Pipits passing from 2 A.M. to 5 A.M. (wind S., moderate breeze). At night, on the rolling away of fog at 9.45, and during intervals of light rain up to 11.15, *Starlings (first) and *Wheatears (first) appeared at the lantern (wind S., moderate breeze, cloudy).

October 10th.—After a gale of three and a half days' duration, the night of the 9th was clear and starlight, with a gentle breeze from the N.N.W.; at 2 A.M. the sky became overcast, and *Song-Thrushes, Mistle-Thrushes (first), Redwings (first), *Skylarks, *Starlings, *Meadow-Pipits, and some undetermined Passerines appeared and were observed until 3.30 A.M. This was the first movement in which Birds of Passage were undoubtedly present—that is to say, species (the Redwing, for instance) which, having arrived in Britain from the Continent, had traversed our shores and were seeking more southerly winter-quarters by crossing the Channel *via* the Eddystone.

October 10th–11th.—During passing showers, from 7.15 P.M. to 9 P.M., Song-Thrushes and Skylarks were present. At 4 A.M., under similar conditions, several Starlings were flying round the lantern. (Wind W.S.W., light breeze.)

October 12th.—During slight showers, between midnight and 2.30 A.M., Pipits, Starlings, and Song-Thrushes were flying in the rays. (Wind S.S.E., light breeze; dark; clear.)

Next followed the chief movement of the past autumn witnessed at the Eddystone. This great passage commenced at 7.15 on the night of the 12th of October, and continued without a break until 5.45 on the morning of the 13th. The weather was favourable for both emigration and observation. The wind was a gentle breeze from the north-east, and the very slight haze which prevailed made it necessary to burn full power in the lamps, whose rays were thus not only doubly brilliant but assumed extraordinary luminosity, and hence attractiveness, as they streamed out upon an atmosphere eminently suited for rendering them conspicuous.

The first birds to appear were a few Starlings, and from 7.30 they were present in numbers down to almost the very close of the movement. These were followed, in the order named, up to midnight, by Blackbirds (first), Skylarks, Stonechats (first), Redwings, Fieldfares (first), Wheatears, and Song-Thrushes. To this hour the birds had continued to arrive and pass on in a steady stream, while many struck the lantern. Soon after midnight a great increase in the emigrants was observed, and the movement assumed the character of a rush southwards. Song-Thrushes, Redwings, Mistle-Thrushes, Blackbirds, Starlings, and Skylarks then appeared in vast numbers, and were followed by Chaffinches, Grey Wagtails (several), Goldcrests (first), Fieldfares (first), White Wagtails (several), Meadow-Pipits, and Curlews. At 5 A.M. the movement received an impetus from a fresh arrival of most of the species named; among others, a Grasshopper Warbler struck the lantern and a small party of Wild Geese passed close over the dome, calling loudly as they flew. Most of the emigrants went steadily southwards, but many tarried, and the majority of the species named were present in some numbers until the first signs of dawn, when the movement waned; and at daybreak all, save a few Starlings resting in a dazed condition in the recesses of the windows, had passed

away. There were also many small Passerines and a number of larger birds—probably Waders, from their notes—present during the movement, but their identity was not established. The Skylarks, Starlings, Song-Thrushes, Redwings, and Blackbirds appeared to be the species most numerously represented, and vast numbers of them were observed; but certain of the smaller birds were almost equally plentiful. It would have been possible to have captured some of them in great numbers; and, as it was, the killed or injured and captured included 76 Skylarks, 53 Starlings, 17 Blackbirds, 9 Song-Thrushes, and examples of the Redwing, Mistle-Thrush, Stonechat, Chaffinch, Meadow-Pipit, Grey Wagtail, White Wagtail, Goldcrest, and Grasshopper Warbler (a young female of the year).

I retained the wings and some specimens of all these birds; and the bodies of the various Thrushes and Skylarks were served up at dinner for several days, and proved a most welcome relief from the tedium of salt beef, which had figured daily for some time past as the standing dish of our bill of fare.

A notable and important feature was the continual arrival, down to almost the very close of the movement, of fresh emigrants, not only of individuals of the kinds early noted but of other species which had not previously participated in it; for instance, the Meadow-Pipit did not appear upon the scene until as late as 4.50 A.M. This continuous succession of arrivals indicated, I think, that some of the birds had come from comparatively near localities on the mainland, while others had travelled from afar ere they reached the Eddystone on their flight southwards. The presence of the Redwing and the Fieldfare added an ultra-British complexion to the passage; and it is possible that others among the migrants, perhaps the majority of them, may also have been drawn from sources beyond the limits of the British Isles. In this connection it may be stated that all the Starlings captured at the lantern (on this and other occasions) belonged to the race having a purple head and green ear-coverts, which is said to be of Continental origin. Be

this as it may, it is a fact, not, perhaps, without significance, that the only specimens I have seen of this form elsewhere were obtained at the Spurn Head Lighthouse in the autumn, and were doubtless immigrants.

Throughout the movement, and especially when it was at its height in the earliest hours of the morning, the scene presented was singular in the extreme and beyond adequate description. Resplendent, as it were, in burnished gold, hosts of birds were fluttering in, or crossing at all angles, the brilliant revolving beams of light; those which simply traversed the rays were illumined for a moment only, and became mere spectres on passing into the gloom. The migrants which winged their way up the beams—and they were many—resembled balls or streaks of approaching light, and they either struck the lantern or, being less entranced, passed out of the rays ere the fatal goal was reached. Of those striking some fell like stones from their violent contact with the glass, while others beat violently against the windows in their wild efforts to reach the focal point of the all-fascinating light. Many of those that freed themselves from the dazzling streams came in sharp contact with the copper dome of the lantern, making it resound again, and then fell like flashes into the surf below, followed slowly by a shower of feathers resembling a miniature storm of golden flakes. Finally, above and below the madding crowd in the illumined zone, great numbers of the emigrants flitted around in dim confusion, and in almost weird contrast with the brilliant multitudes gyrating in the adjacent vistas of light. The accompanying babel of tongues was also a striking feature. These were not cries of gratification, but of surprise and alarm; and they varied from the loud rattling notes of the Blackbird and the harsh angry “churr” of the Mistle-Thrush to the faint and dainty twitter of the Goldcrest. Some Skylarks every now and then, under the impulse of excitement no doubt, broke out into a few notes of song. Not a few strange voices were heard, some probably uttered by species with whose ordinary notes one was quite familiar; but migrants, especially Waders, have a travel-talk which is,

as yet, an unknown tongue to most of us. Nor was it an easy matter to promptly assign a familiar note to its rightful throat when heard under such highly peculiar conditions, and to an accompaniment supplied by the roar of the surf on the surrounding reefs.

It was interesting to note the varying degree in which the mesmeric influence of the light was exercised over the different species. The Starling was the most susceptible subject present; and this clever bird became under the sway of the lantern not only a complete fool, but a seemingly willing sacrifice. It was quite fearless and indifferent to the presence of myself and the keepers on the gallery, for it hustled past us in unceremonious fashion to reach the lantern, and, being baulked on the threshold by the windows, made vigorous attempts to reach the seductive lamp, and then sat half-exhausted on the sills and sashes, drinking-in, as it were, the light until it became quite stupefied, and when picked off would sit contentedly on one's hand. Great numbers were removed from the lantern and cast over into the darkness below; but many of them immediately returned. The Skylark was nearly as frequent a victim. It came up in great numbers to the light, but not being accustomed to perch on such slight coigns of vantage as the metal framework of the lantern offered, it fluttered violently against the glass for a time and, becoming exhausted, sank prostrate on the gallery*. It would have been quite possible to have captured a thousand Starlings and as many Skylarks. It was otherwise with the various species of *Turdus*. These, though present in equal or even greater numbers than either of the species just alluded to, were not affected to anything like the same degree. The Blackbirds and Song-Thrushes approached the lantern more freely than the rest of their genus, but they had a habit of coming

* I may here remark that I took with me to the Eddystone a quantity of netting, with which I completely surrounded the gallery by hanging it perpendicularly from the railing. The object was to prevent any birds that struck from falling over. It answered admirably, and was the means of saving many birds which would otherwise have been lost.

up to some extent "side on," so to speak, and consequently they glanced off either little stunned or quite uninjured. These birds did not attempt to remain at the lantern, and those which were captured shewed extreme fear. The Red-wing, one of the most numerous species present, was very shy, and still more so were the Mistle-Thrushes and the Fieldfares; the latter only approached the lantern and did not strike.

That this was a great movement, seen under favourable conditions, is evident from the fact that the senior keeper had only once before during his sixteen years' experience seen one of equal magnitude, namely at the Casquets off Alderney. The other keepers had not seen anything like it before. It appears to have been a far-reaching movement, too; for at the Bishop's Rock Lighthouse, south of the Scilly Isles and one hundred miles west of the Eddystone, a considerable migration was in progress at the same time, and Starlings, Thrushes, and Fieldfares are recorded as having been captured at the lantern. It was not, however, a great night for victims apart from Starlings and Skylarks; but had a thick drizzling rain replaced the thin veil of haze, the slaughter would, in the opinion of the keepers, have been appalling, so numerous were the emigrants and so long-continued their passage.

On the night of October 13th-14th, between 6.50 p.m. and 2 a.m., a few *Skylarks, *Starlings, *Song-Thrushes, *Chaffinches, several Turtle-Doves, and a *White Wagtail were observed at or around the lantern. The night was, on the whole, starlight and clear, but there were periods during which it was overcast, and then it was that the birds approached the lighthouse. (Wind E.S.E., gentle breeze.)

The White Wagtail had not hitherto been detected quitting our shores in the autumn. Its occurrence at the Eddystone lantern on the nights of the 13th and 14th of October is of further interest, since the dates are, I believe, the latest on record for the observation of this bird within the British area. Both the examples secured were young birds in winter plumage.

The last of the night-movements during my visit was one of considerable magnitude and remarkable interest. It set in on the night of October 15th, and was in progress until nearly daybreak of the following morning. The meteorological conditions under which it was witnessed were exceptional, and afforded a clear and unmistakable demonstration of the effect of weather-influences and the extent to which we are dependent thereon for rendering the observation of migratory movements possible. In this important respect it was one of the most valuable experiences that I had. The night was bright and starlight until 7.30 P.M.; but from that hour until daybreak the state of the atmosphere was ever oscillating between intervals of brightness and those during which the sky was overcast with a slight degree of haziness, rendering the Breakwater Light at Plymouth invisible, and full power necessary at the Eddystone. The wind was E.N.E. and varied in force from a moderate to a gentle breeze. After a little experience it became possible to tell, by watching the beams of light, what the atmospheric conditions of the moment and the chances of observation were. The beams grew conspicuous when the sky became overcast through the presence of moisture in the atmosphere, and then the birds immediately approached the beacon; but as soon as this condition passed away the rays at once thinned down and became little more than visible, the birds sheared off, and the movement in progress ceased to be observed. During the duration of the periods favourable for observation, between 7.35 P.M. and midnight, the following species were observed:—Song-Thrushes, Mistle-Thrushes, Redwings, Skylarks, Goldcrests, Starlings (first at 10.30), Blackbirds (11.30), Wheatears (11.45), Grey Wagtail, and Stonechats (midnight). At 9.40 a number of Waders passed, but their calls were in an unknown tongue. The period between 11.15 P.M. and midnight was the most productive of results. At intervals between 1 A.M. and daybreak Wagtails, Mistle-Thrushes, Goldcrests, Starlings, Larks, Wheatears, Wrens (1.15 A.M.), Song-Thrushes, Meadow-Pipits (2.30 A.M.), Redwings, Blackbirds, and Storm-Petrels were observed—the

chief periods being from 1 A.M. to 1.45 A.M. and from 2.30 A.M. to 3 A.M.; but some of the species named were observed at intervals until daylight appeared. There was practically no tarrying at the lantern, owing to the attractive periods being so short in duration, and the observations afforded direct evidence that the movement was continuous and that it was in progress for at least ten hours.

The Song-Thrush and the Skylark appeared to be the most abundant species, and the latter was occasionally quite a nuisance at the lantern. The extreme scarcity of the Starling was remarkable, but, on the other hand, the abundance of the Mistle-Thrush was noticeable. The emigrants were at times very numerous, and though the atmospheric conditions were not greatly in favour of many striking the lantern, yet those killed included 11 Thrushes, 8 Larks, 3 Mistle-Thrushes, 4 Blackbirds, and examples of the Meadow-Pipit, Redwing, Goldcrest, Wheatear, Grey Wagtail, Wren, and Storm-Petrel.

I will now treat of the migratory movements observed during the daytime.

It will be well to preface the observations by remarking upon the great difficulty of detecting small birds at sea. This is chiefly to be accounted for by the fact that the surface of the water being ever in motion forms a most unsatisfactory background on which to "pick up" such birds on the wing. Dark or sober-coloured species are especially difficult to detect; but the few that shewed any white in their plumage during flight came under notice almost at once.

The day migrations of land-birds observed, though of considerable importance, were entirely confined to passage movements across the Channel in a due southerly direction. The species participating in these emigrations were few, and consisted chiefly of Meadow-Pipits, several kinds of Wagtails, and Swallows; but the number of individuals was very considerable. A few Willow-Warblers, Linnets, and House-Martins were also observed, but their numbers were

so small, and the occasions on which they appeared so rare, that they do not merit further consideration.

Daily throughout my visit when the weather was favourable, that is to say when a light wind prevailed, no matter from what quarter, the passage of Meadow-Pipits and Wagtails was of regular occurrence. The movements were performed during particular hours only, commencing soon after daylight—*i. e.* from 6.15 A.M. to 7 A.M.—and were entirely over by or before midday. So rigidly were these hours adhered to by the emigrants, that I soon found the afternoons to be quite unproductive, and consequently I regulated my hours of rest accordingly.

The Meadow-Pipits often passed in small parties, consisting of as many as a score, but frequently in twos and threes, and sometimes even singly; while the height of their flight varied from twenty feet, or less, above the water to occasionally as much as two hundred feet, the direction being due south. The birds were observed on emigration, in greater or less numbers, on sixteen days*, during which vast numbers passed close to the lighthouse: the passage being on some days continuous between sunrise and midday. The greatest movements were chronicled between September 30th and October 1st, 2nd, 3rd, 5th, and 15th. They invariably uttered their familiar notes as they flitted by.

On the same days, with hardly an exception, and during the same hours of the morning and forenoon that the Pipits were on the move, Wagtails, singly or in pairs—but never more than three together, and that seldom—were observed moving southwards. The species identified were the Pied, the White, and the Grey Wagtail; but in what proportion I was unable to determine, for it was only occasionally that the birds were seen under conditions which permitted of their being identified with certainty—chiefly when they broke their journey, as they sometimes did, and alighted on the reefs at low water. These birds generally flew at a comparatively considerable elevation, seldom below that of the gallery (130 feet),

* I was 32 days on the rock, and during that period 14 days were entirely unsuited for migration, owing to adverse weather-conditions.



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