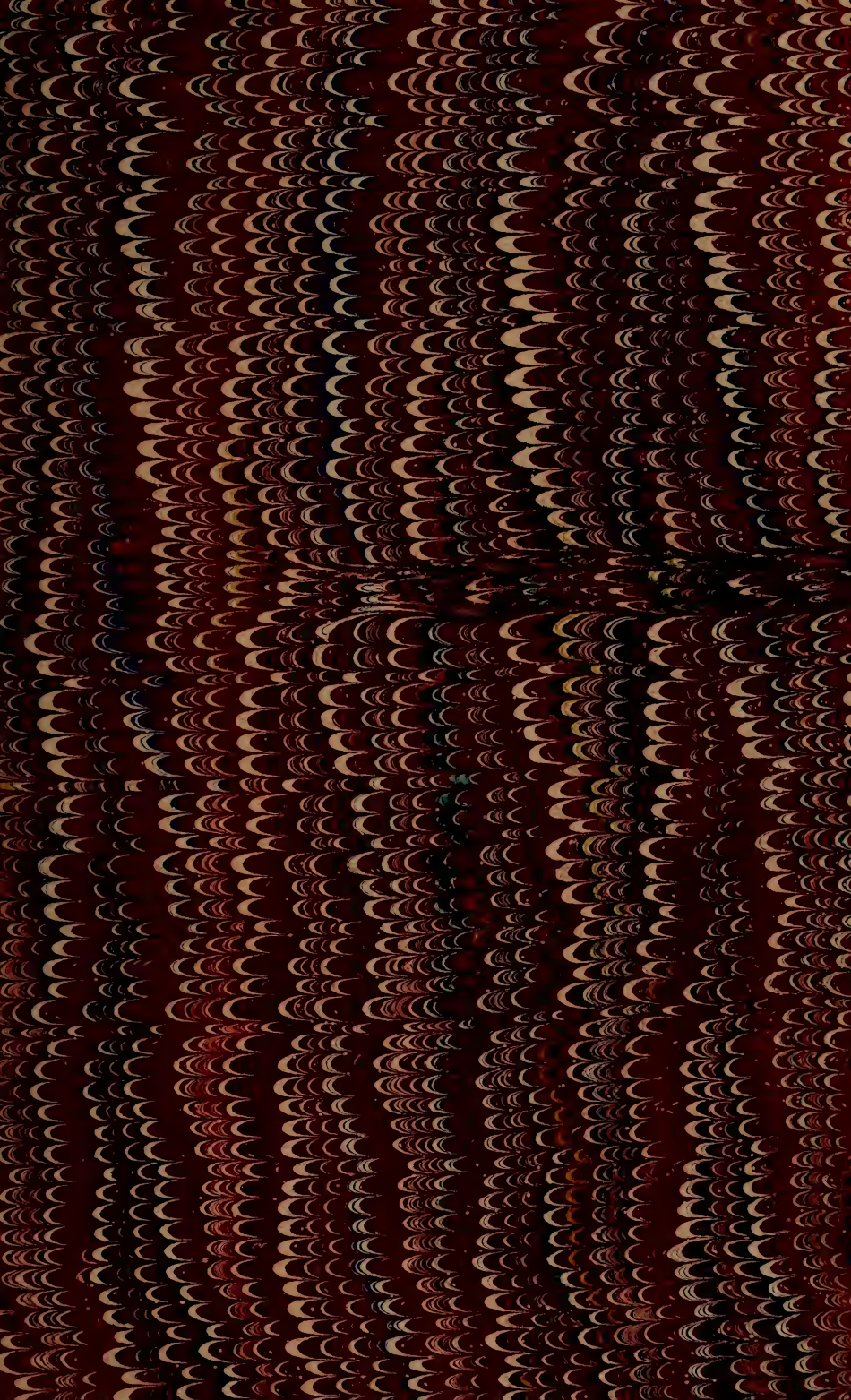


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THE ZOOLOGIST:

A MONTHLY JOURNAL

OF

NATURAL HISTORY.

THIRD SERIES—VOL. XIX.

EDITED BY

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

MEMBER OF THE BRITISH ORNITHOLOGISTS' UNION.

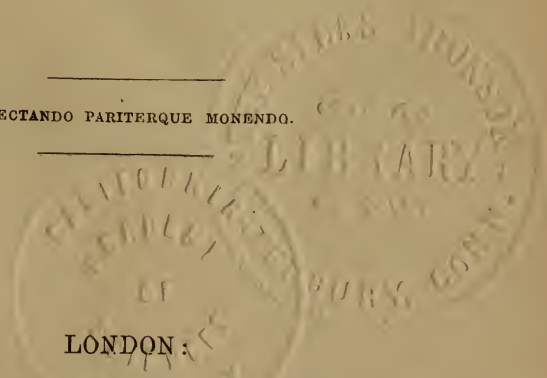
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HATTON GARDEN, E.C.



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THE ZOOLOGIST

No. 217.—January, 1895.

ON THE GEOGRAPHICAL DISTRIBUTION OF THE EUROPEAN
AND CAUCASIAN BISON.*

BY BERNARD LANGKAVEL (OF HAMBURG).

THE narrow limits of this article preclude any mention of the Bison in prehistoric times. Such information concerning it as history affords has been already collected by Brehm in his 'Tierleben.' In remote historic times it was to be found not only in Central Europe, but in Spain, throughout Pannonia, and in Thrace, where the Cossack-like Pæonian hunters were transformed into centaurs by Greek travellers' tales. †

Frequent wars, especially the devastating Thirty-Years War, drove these animals out of Germany further north and east; their numbers diminished, the cows being often barren for three or four years. ‡

In Pomerania the last one was shot by Duke Wratisslaw V. about the middle of the 14th century, and one of its horns was used first as a drinking-cup, and then as a reliquary in the Cathedral of Cammin. §

When Henry IV. of England visited Prussia in 1390–91, a Bison and two Bears were presented to him ('Preussisches

* Translated from the German in 'Der Zoologische Garten' (Frankfurt-a-M.), 1894, pp. 13–17, 43–49.

† Gaudry, 'Verfahren der Säugetiere in Europa,' p. 169; Keller, 'Tiere des Klass. Altertums,' pp. 53, 56.

‡ 'Neue Deutsche Jagd-Zeitung,' v. p. 307; Günther, 'Der Harz,' p. 582; 'Zoologische Garten,' vol. ix. p. 64; xviii. p. 229; xxi. p. 219.

§ 'Zoologische Garten,' viii. p. 307; xiv. p. 113; 'Zeitschrift der Gesellschaft für Erdkunde, Berlin,' xix. p. 402.

Jahrbuch,' 1892, p. 303). The breed survived for some time in the pine forests of Johannsburg, together with Elk, Bears, and wild Horses;* but no mention of it occurs in the hunting literature of the 16th and 17th centuries, while in the 18th century Fleming ('Der vollkommene Teutsche Jäger') and Döbel ('Neu eröffnete Jägerpraktike') only briefly allude to it as having entirely disappeared from Germany by the end of the previous century.

Lithuania, of which the ancients had some knowledge (see Pallas, 'Neue Nordische Beiträge, I. p. 1, and my observations on *Bonassus* and *Bos* in the Index to Aristotle published by the Berlin Academy in 1870), was then the only district in the north which sheltered it, as mentioned by Baron von Herberstein in a much-contested passage.† Besides the authors mentioned in my Essay, I quoted Wiegmann's 'Archiv für Naturgeschichte,' 1839, pp. 75—78; 1841, pp. 55, 56; 1847, p. 225; Erman's 'Archiv,' 1852, pp. 30—40; 'Die Gartenlaube,' 1860, p. 725; 'Neue Deutsche Jagd-Zeitung,' v. pp. 289, 297, 306, 314; vi. p. 134, &c. . . . Schiller Tietz, in his brochure 'Inzucht und Consanguinität,' has expressed the view held by many that animals which are confined in a comparatively small space will diminish in size. For example, the Bison is said to have formerly weighed as much as 1000 kilos., but now only from 500 to 600 kilos.

According to the 'Neue Deutsche Jagd-Zeitung' (xiii. p. 196), Bison in the forest of Bialowicza generally weigh about 600 kilos., and several weighed 20 cwt (v. p. 307). Formerly they were 7 ft. high, 10 to 12 ft. in length, and weighed from 19 to 22 cwt. One killed in 1595 by Johann Sigismund of Prussia weighed 19 cwt., or 100 lbs. less than our old friend in the Berlin Zoological Gardens.‡ The cows, which are not fully matured until they are

* Hagen, 'Geschichte des preussischen Auers,' 1819.

† Carus, 'Geschichte der Zoologie,' p. 337; 'Zoologische Garten,' viii. p. 3.

‡ The way in which deer and other wild animals were formerly weighed may be illustrated by the following quotation from an article by J. E. H. on the Hunting Trophies in the German Exhibition of 1891 ('The Field,' July 4th and 18th, 1891):—"Here also we may note two other objects which figure in the old paintings above referred to, and which perhaps served as actual models to the artist—namely, the *game weighing-machine* and the *game-carrier*. The former may be described as a cross-beam supported on

six or seven years old, weigh considerably less. Reports as to the weight of these animals date from a few centuries back, but are very scattered even at the present day.

Under these circumstances, is it right to assume that a diminution in size has been caused by in-breeding amongst many hundred of these animals in such an extensive area as that of Bialowicza?

In our Zoological Gardens the conditions for many of the animals are quite different. Omitting all description of the structural and osteological details, I will only allude to Baumer's Essay of 1824, in which he attributes to the Bison two ribs more than are possessed by the domestic cow. See Owen, Proc. Zool. Soc. 1848, p. 129, and Dolmatoff, *ib.* iii. p. 48. Ludwig ('*Neue Deutsche Jagd-Zeitung*,' v. p. 325) and others have written about its horns ('*Die Natur*,' 1888, p. 215). According to Dr. A. Nehring, *Bison europæus* has a shorter and more shapely metatarsus than *Bos primigenius*.* The skulls of their American relative are said to make comfortable seats in Indian wigwams, and those of the Urus and Bison were used by the European pile-dwellers of old; for, as Victor von Scheffel sings in '*Gaudeamus*':—

“ If I build my small hut in the open
The Aurochs will stamp it to pieces.”

Bison skins were used for clothing in the earliest times, and in Hungary in the 17th century were appropriated to various purposes.

Wild, the head forester at Pless, observed that the cows were in heat at all seasons and were invariably covered by the oldest bulls. The period of gestation is 274 days, and calves are born at all times of year, doing well even when there is 20° of cold.

It has often been said that there is such antipathy between the Bison and the domestic cow that they will not interbreed, †

high trestles, through which passes an iron bar terminated by a large hook. From this hook the deer was suspended by all four legs lashed together, and raised from the ground by a windlass until its weight was indicated on a scale. The *game-carrier* consists of a couple of fir-poles laid horizontally about a yard apart, with a hammock of strong netting lashed between them. On this the stricken deer was laid and transported.”—ED.

* '*Zeitschrift für Ethnologie*,' xx. p. 222.

† Eichwald, '*Beschreibung von Littauen*,' p. 37.

and that the former is untamable;* but Count Walicki has proved the contrary by crossing the Bison with his Swiss cows.

Old Sulzer, in his 'Geschichte des transalpinischen Daciens,' 1781 (i. p. 71), gives an account of a bull Bison "with a long mane and short legs," which followed a cow into her stall on several evenings, an incident which Brehm rightly attributes to "amorousness" overcoming natural dislike. Brehm also alludes to the Bison gradually becoming tame, and following people for food, as at Bialowicza for example; while Count Franz Lazár reported that in 1740 (or as others say in 1770) he drove to the Diet at Hermannstadt with a beautiful team of Bison from the Gyergyoer Forest.†

Whether the *indomiti boves* driven by Oriental princes were Bison or wild cattle is uncertain. In Clothair's time the King drove with oxen to the public assemblies. The Gothic rulers even drove stags,‡ and so late as the beginning of the present century a head forester near Stettin had a team of four of these animals.

Bison were for a long time to be found in the Hungarian Siebenbürgen. 'Der Weidmann,' quoting from a work by Stefan König ('Die Geschichte der Jagd in Ungarn'), which was shortly to appear, states that the last Bison was killed by a clever crossbow shooter in the forest of Sohl, Upper Hungary, in the reign of King Mathias (1458—1490); according to Alex. von Ujfalvy, the last was killed at Borgo on the Play Höhe in the Siebenbürgen in 1762; while others report that in 1775 some still existed in the Udvárhelyer Komitat.

Sulzer (*op. cit.* p. 54) states that Prince Kantemir in describing Moldavia mentioned an animal called *Zimbr* (i. e. *Zubr*), which neither he (Sulzer) nor any one else had seen, and which might have been a Buffalo (*ein Büffel*). Eichwald at first supposed that a record of the year 1582 of "*Zumbro bestiæ feræ in Tauroscythia*" had reference to the Crimea, but afterwards translated

* Oscar Schmidt, 'Die Säugethiere,' p. 169.

† 'Neue Deutsche Jagd-Zeitung,' xiii. p. 176; and 'Der Weidmann,' xxiv. p. 432.

‡ See Carus, 'Geschichte der Zoologie,' p. 35; and Victor Hehn's well-known work, pp. 40, 41, 61, 109.

Tauroscythia to mean Moldavia.* Edward von Czzynek assigns a much later period for the existence of the Bison in the forests of Csik, Udvárhely, and Gyergyó, giving 1814 as the year of the last one's death in the Siebenbürgen.†

Numbers were said to inhabit the Gyergyó mountains in 1534, and even a century later.

Mecklenburg has an ox's head on its coat of arms; the family of Count Was in Hungary a Bison's head; while the Lazár family above referred to bears upon its shield a Bison pierced by an arrow. We may add that a print published by Anton Wied of Danzig in 1555 represents a Urus (Bison) being killed with a long spear.

In the Russian empire the Bison is only found wild in two districts. To deal first with the most easterly, the story of the Argonauts and their fire-breathing bulls (reminding one strongly of the Greek account of the African Gnu) is probably the earliest mention of the Bison in the Caucasus, that difficult country to cross, which entirely blocks the narrow strip of land which separates the Black Sea from the Caspian. I imagine these "fire-breathing" animals to be Bison, whose defiant eyes when angry become glowing red.‡

The earliest reliable information about this animal dates probably from the year 1633, when mention is made of wild Buffaloes on the borders of Abkasia.§

The fact that so little has been heard of the animal since that time may be accounted for in two ways. Being very alert as well as very shy, and clever in hiding from its pursuers when once warned, it may have gradually withdrawn into the higher parts of the mountain range, where it would be safe. Fischer Sigwart, in his interesting little work on mountains as a refuge for wild animals,|| enumerates the European mammalia which eventually found there the only conditions favourable to their existence; the European Bison, which gradually died out, is not one of these. The Caucasian animal, however, found a cool retreat there in

* 'Beiträge zur Kenntniss des russischen Reichs,' 1883, vi. p. 16.

† 'Neue Deutsche Jagd-Zeitung,' xiii. p. 196; 'Zoologische Garten,' 1889, p. 281.

‡ Keller, 'Tiere des Klass. Altertums,' p. 57.

§ Eichwald, 'Beiträge zur Kenntniss des russischen Reichs,' vi. p. 16.

|| 'Das Gebirge ein Rückzugsgebiet für die Tierwelt'

summer, being able to climb as well as an Elephant. Travelling Russians who passed through the country left it unnoticed; nay, even denied its existence, or considered it extinct, having found dozens of its horns amongst those preserved in old churches of Swanetia, which are now regarded as treasure-houses, and are under the care of the state. Many travellers, however, have confused the horns of the Bison with those of *Ægoceros pallasii*.*

In Caucasia, as in Europe, the horns were used as drinking-vessels. At a feast given by a Caucasian noble in honour of General von Rosen, the table was graced with seventy Bison-horns richly set in silver. Nehring, by the way, states ('Neue Deutsche Jagd-Zeitung,' vii. p. 370) that a single horn holds barely 4 litres of liquor, much less than is contained by a horn of *Bos primigenius*. From a skin obtained by General von Rosen, both Brandt (Bull. Soc. Nat. Moscow, 1866) and Von Baer have judged the Caucasian Bison to be specifically identical with the Lithuanian animal.†

The theory advanced by Ussow in the 'Proceedings of the Imperial Russian Acclimatisation Society,' 1865, and by Koch ('Reisen durch Russland,' ii. p. 70), that the Bisons of Caucasia and Lithuania are specifically distinct, is therefore no longer tenable.

In the 'Verhandlungen der Gessellschaft für Erdkunde,' Berlin, 1881, p. 38, we find a statement to the effect that Bison are still to be found "in some parts" of the above-mentioned mountains. Let us examine this more closely. Von Thielmann, in 1877 ('Streifzüge im Kaukasus,' p. 108), located their original home in the watershed of the river Kuban, whence they probably wandered into Abkasia; this accounts for their being known there as *dombai*, *dombe*, or *adompe*. Gustav Radde (Zool. Garten, 1891, p. 320) does not confirm the statement that the Bison was smaller here than in Lithuania; and that indefatigable explorer had good opportunities for observing the beast which inhabited

* 'See 'Ausland,' 1888, p. 803, and Oliver Wardrop, Proc. Geogr. Soc. London, 1888, p. 807.

† 'Neue Deutsche Jagd-Zeitung,' xiii. pp. 55, 116; 'Zoologische Garten,' vii. p. 350; ix. p. 216; Von Middendorf, Reise IV. ii. p. 1048; Petzholdt, 'Der Kaukasus,' p. 164. An amusing mistake occurs in a French translation of Brandt's paper, wherein his statement that the animal was found in herds (*in Rudeln*) is rendered "dans une localité nommée Rudeln"

the district, when he visited the glacier heights of the Marucha Mountains, near the Pass of Nachar, on his way back from Elbruz in 1865.* On his last journey through the district surrounding the sources of the Laba and Bjellaja, north of the Caucasus, and thence to the source of the Selentschück, he found Bison, but everywhere in small numbers, not more than two or three together, and on one occasion traces of seven. The arrival of fresh colonists had caused them to forsake their settled habits, and to take to wandering. He frequently met with them, however, about the source of the Little Laba, and especially near the western tributary Uruschtem, and the small lake of Alaus at an altitude of 7–8000 feet. Some thirty or forty years previously they had been found at a height of 5000 feet. The whole district of about 525,000 hectares has been under imperial control since 1860, but it is very difficult to guard against poachers.† In the museum at Tiflis there is a unique and beautiful group, set up under Radde's supervision, which represents a fight between a Bison and a Panther.‡

In earlier times *Bison europæus* was probably distributed over the greater part of the forest zone within the present boundaries of European Russia, as well as on the steppes; but, like its North American relative, it has gradually disappeared, and is now confined (so far as Europe is concerned) to a single forest district in Lithuania. Augustus III. of Poland, Kurfürst of Saxony, made a reserve, some thirty square miles in extent, for Bison at Bialowicza, in the present government of Grodno, on the Prussian frontier, out of a forest which lay surrounded by desert steppes.§ Franz Müller (Mittheil. der Geogr. Gessels. Wien, 1859, p. 155) gives an exact plan of the whole area, which was enclosed by a strong wooden fence more than three metres high. In one place a stand was erected for the King and his distinguished guests, so that the sportsmen might be safely out of

* Petermann's 'Mittheilungen,' 1867, p. 13; 1868, p. 72.

† 'Deutsche Jäger-Zeitung,' xxii. p. 49.

‡ 'Jahresbericht des Vereins für Erdkunde,' Dresden, xv. p. 15.

§ 'Deutsche Jäger-Zeitung,' xxi. p. 287; Eichwald, 'Beiträge zur Kenntniss des russischen Reichs,' vi. pp. 137, 244; 'Zeitschrift für wissenschaftliche Geographie,' iii. p. 138 (*vide* Brandt); 'Zoologische Garten,' vii. p. 350; xiv. p. 21.

the way of the beasts they were to slay. Twenty paces from this stand was an opening in the fence, through which the animals were driven. There could be surely no great skill required in shooting at a driven herd from so short a distance, but merely the brutal enjoyment of killing a large number of animals—a trait which unfortunately is not yet extinct, as the massacres of modern times in North America and South Africa have shown. At the period referred to, on a great hunting day, forty-two head have been killed, of which the Queen alone killed twenty, and found time (it is said) to read a novel whilst waiting for the beaters to come up!

Statistics as to the number of Bison then existing are of a doubtful character. In 1829, 711 head were reported, including 633 adult animals; in 1830, 772; in 1831, 657; in 1853, 1543; in 1857, 1898; in 1866, according to a Government report, from 1500 to 2000, but according to the foresters, only 500; in 1882, 600; in 1886, 433; in 1889, 380; and in 1892, 491. The noticeable diminution of numbers, notwithstanding the large amount expended on their preservation, is due to untrustworthy management, the forest grant being unjustifiably appropriated, and poachers allowed to take what they liked. The responsible “woodwards” invented all sorts of diseases and epidemics to account for the disappearance of the game.

This tract of forest has now for some years belonged to the Apanage Department, and the numbers no longer decrease. A purely military guard has superseded the foresters.* After many experiments, mostly with negative results, any young motherless Bison, Elk, and Red-deer that are found are now brought up on cow's milk. For calves of from one to two months old this is mixed with an equal quantity of warm water, which is gradually diminished. After four months they take to bruised oats. As the milk easily turns sour, and is then said to cause intestinal inflammation, eight or ten teaspoonfuls of infused tea are added to each half-litre. The latest *protégés* of the superintendent, a fine strong bull Bison and four cows, were sent to Pless as a present in February, 1893.

From Bialowicza, as well as from the Caucasus, living

* ‘Zoologische Garten,’ vii. p. 350; ‘Neue Deutsche Jagd-Zeitung,’ vi. p. 134; x. p. 278; xiii. p. 186; ‘Deutsche Jäger-Zeitung,’ xx. p. 123; xxi. p. 127.

specimens have been forwarded to various Zoological Gardens, and dead ones sent to museums. The specimen in the Tiflis Museum has been already referred to; one was sent from Bialowicza to the Copenhagen museum, and a skin of another, killed by a Berlin animal painter at Bialowicza, was presented by the Czar to the Gottingen Museum.

In order to become acquainted with new haunts and higher feeding-ground the Bison must have been forced to quit their original haunts many years ago. Probably they were captured in the manner described by Pausanias (x. 13. 2), and transported to Rome to take part in the public spectacles of Domitian.

Voigt, in his 'History of Prussia' (i. p. 544), states that at that time both Bison and Elk were numerous in the forests of Prussia, and that both were occasionally caught and sold into foreign lands, including Italy. Polish nobles kept them in their parks at Ostrolenka, Warsaw, Zamosk, &c. Frederick III., Kurfürst of Saxony, sent for Elk and Bison from Lithuania, and established them in various deer-parks, as well as at Berlin. In 1689 they were turned out into the unenclosed hunting-ground, but did not flourish, and all attempts to make them do so proved unsuccessful.

In 1717 two were sent to the Landgrave of Hesse Cassel, but they also speedily succumbed.

The Prince of Pless owns the largest and most important game-preserve in which imported Bison are now to be found. About a century after the last Bison in Prussia had been killed by two poachers in 1755, the Prince of Pless re-introduced the species, sending the Czar some Red-deer in exchange for a three-year-old bull and three cows, which he turned into the great deer-forest of Emanuelsegen, six hundred hectares in extent. By 1874, some twenty years later, they and their descendants had wandered two miles southwards, into the district of Mezenitz.* Later on fresh blood was introduced by the importation of other animals from Bialowicza. In 1885 the number of the herd was twelve, of which six were bulls, four cows, and two calves under

* See the Report on this park to 1890 by the head forester Wild, in 'Neue Deutsche Jäger-Zeitung,' x. p. 235; also 'Der Deutsche Jäger,' vi. p. 119; and 'Der Zoologische Garten,' vii. p. 350.

a year old.* In winter each animal receives 10 kilos. of good meadow hay with 2 kilos. of oats; now and then, instead of the latter, bark mixed with flour and meal are given. Trials of lupin and barley were not successful, as both digested badly.

The shooting of Bison by the Czar and by royal visitors is always duly reported in the sporting papers. The technical names for Bison in use at Pless are probably very ancient: *zeber* for bull, *zubszica* for cow, *czelen* for calf. In old German hunting terminology, the cow was *tier*, the calf *auer-kalb* or *tier-kalb*, the bull *hörner*, *gehörn*, *waffen*, and at Pless *aufsatz* (head-piece). None of these terms are included in Dombrowski's 'Deutsche Waidmanns-sprache.'

The animals in the park at Schönbrunn, presented by the Czar from Bialowicza, are said to have flourished and increased.

For a notice of the Bison in the Berlin Zoological Gardens, see Bodinus, 'Die Tierwelt des Zool. Gartens,' ed. 1871, p. 95, and 'Die Gartenlaube,' 1864, p. 710, with an illustration. The Bison in the Dresden Zoological Gardens did not come direct from Bialowicza, but from Schönbrunn, the Emperor Franz Joseph having presented a three-year-old bull and a two-year-old cow. The cow had a calf in 1860, but it was badly treated and finally trampled upon by its parents. A second calf survived. Only one cow is now to be found there, which was born in the seventies.

Bison were sent to London to George IV., and also in 1848 and 1860 to Queen Victoria, though the pair last sent did not come straight from Bialowicza, but had been kept at Grodno for a time.

In November, 1868, according to the latest 'List of the Vertebrate Animals,' a living European Bison was received at the Zoological Gardens of London, which was born in the Amsterdam Gardens on July 14th, 1865.

The Empress Katharine had long before received some in 1738, and a pair went to St. Petersburg in 1860, which had also been kept at Grodno for a time.

The Zoological Gardens at Moscow even possessed a Caucasian Bison, which was captured by Adjeff, near Ateikhar, and safely conveyed to Moscow with great difficulty on Dec. 19th, 1866. In the same year there was also one of northern origin there, received from the Zoological Garden of Gatschina.

* 'Neue Deutsche Jagd-Zeitung,' v. p. 314. It is erroneously stated in the 'Landwirth, Zeitung des Hamb. Korrespondenten,' 1884 (p. 54), that in this year the number rose to 30—40.

ON THE NAMES GIVEN TO THE MOLE.

BY PROF. HERBERT A. STRONG, M.A., LL.D.

THE Latin *talpa* for *stalpa*, and the Greek ἀσπάλαξ or σπάλαξ, both come from the root “scalp” and signify the “digger.” The Latin shows *st* as against the Greek *sp*, cp. studium with σπεύδω; and for the disappearance of the *s*. cp. cutis with scutum.

The Italians received the word *talpa* and employed it to signify “a mole,” but altered the word into *topo* to signify equally a rat or a mouse—an instance, as it seems to me, of their lack of observation of animal nature. They seem to have given the name of *topo* to the mysterious animals which came to them from the East in the third or fourth centuries, which received the name of *hratte*, our rat, from the Slavish name for mole, *krot*. It seems likely, from the fact that the Low German form *ratte* is more commonly used in German than the H. German form *ratze*, that the incursion of rodents may have skirted the Baltic and passed through Low German countries. The Russians, however, evolved another word for rat, *krysa*, and retained the old Aryan word for mouse under the form *muish*. The French discarded this root, and employed *souris*, from *soricem*. The Romansch of Dissentis retains the form *mur*.

Reverting to the Mole, the old Germans called it “earth-thrower,” *mold-wurf*, Icelandic *mold-varpa*, which popular etymology soon turned into “maul-wurf,” or “mouth-thrower.” The Scotch form “moudie-wort” is well known. Palmer quotes Topsell’s ‘Historie of Foure-footed Beasts’ (1608), p. 500, “With her feete she diggeth, and with her nose casteth away the earth, and therefore such earth is called in Germany *mal-werff* and in England molehill.” In the west of England the word for mole is “want,” which comes apparently from the same root as the modern German *wenden*, to turn, from the tortuous passages it makes beneath the earth.

Dr. Meyer, the Celtic scholar (my colleague), informs me that in the Celtic languages we find a variety of words for mole, but there is no one common Celtic term. The Brythonic branch has indeed one word common to all the languages which it embraces, viz. *gwadd* in Welsh, *gôz* in Breton, *gwdd* (or *ddaor*) in Cornish. But Edward Lloyd (1707) gives besides for Welsh, *twrch daear*,

literally "earth hog" or "earth-burrower," and he adds as obsolete terms *orddodyn* and *ylltyr*.

In Irish we have *caochán* (the blind creature), *criadh-luch* (the earth mouse), *luch dall* (the blind mouse). In Scotch Gaelic we find *famh* or *famh thalmasnn*, *ùir-fhamh*.

In Manx the mole is called *kyaghan-caochán*, *roddan-ooirey*, the earth rat, or *lugh-ghoal*, Welsh rat.

Palladius, who probably wrote about the reign of Theodosius in the 4th century A.D., gives directions for getting rid of the Mole as one of the banes of the agriculturist. An unknown translator, whose work is published by the Early English Text Society, gives the following quaint version of Palladius's injunctions:—

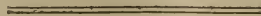
“THE MOLDEWARP THE GREKES THUS PURSUE:—

Thai thurle a nutte, and stuffe it so withinne
 With brymstoon, chaf, and cedria, thees three.
 Then alle her hooles the molde is ynne
 Save oon, the moste, uppe stopped must thai be.
 The fyred nuttes smolder shall thorowe fle
 This grettest hoole, as wol the wynde him serve
 And either shall thees talpes voide or sterve.”

From another passage in this translation we see that the Mole was actually called the Mold, hence our word is evidently a corruption of that form.

Our friend Pliny does not tell us much about the Mole that is worthy of record. He affirms that these animals hear better when underground; that the magicians of Persia hold them in especial reverence; that they are killed by pouring "amurca" (wine-lees) into their holes; that mats were made of mole-skins; that they have no eyes; and that a town had been undermined by them. Virgil also believed them to be blind, and regarded them as one of the pests of the farmer.

In the 'Philosopher's Banquet' (1633), we are told that water in which Moles were boiled had the property of turning what was black to white!



ON BIRDS OBSERVED IN SOUTH WALES.

By O. V. APLIN.

THE recent appearance in 'The Zoologist' of a review of Mr. Mathew's 'Birds of Pembrokeshire,' and two very interesting lists of Welsh birds, *viz.*, Mr. Rawlings' list of the birds of the Barmouth district (p. 328), and Mr. Harold Raeburn's list of birds seen in Mid-Wales (including parts of Montgomery, Radnor, and Cardigan) in May, 1894 (p. 406), has suggested that perhaps a list of the species seen by me during a brief visit to Carmarthenshire in June last might be of interest for comparison with those above mentioned.

The scene of my observations was a valley, with its tributaries, and the low but steep mountains rising therefrom. The tops of these hills were not more than from 1100 to 1300 feet (about 1500 in some cases) above the sea-level. The sides of them were often very steep; the upper portions were rocky in places; the tops consisted of moorland, chiefly covered with grass, but here and there clothed with a little ling. A considerable portion of the hillside is covered with wood, consisting almost entirely of spruce and oak. In the lower parts, and along the stream and torrent banks, you find alder, birch, wychelm, rowan, hazel, &c. The district therefore is suitable for woodland birds.

A few species were conspicuous by their rarity or absence. Foremost amongst these was the Spotted Flycatcher, although I had seen it just before on the banks of the Wye in Breconshire. Mr. Raeburn does not mention meeting with it in his tour in Mid-Wales. It is however reported as common at Barmouth (p. 330). The Grey Wagtail I did not happen to see, probably because the adult individuals of this species had betaken themselves to the smaller streams, which wind away among the mountains, to breed, and the young had not yet come down. But it was curious that I did not see a single Stonechat, though the ground was suitable for it. I find that Mr. Raeburn did not meet with it either. Yet it seems to be common in Pembrokeshire, as well as in North Wales. I have seen it on Penmaenmawr, in Carnarvonshire, in July, and noticed a good many in Merionethshire in October, 1884. Mr. Rawlings says that, although resident and common in the Barmouth district, it is only

just recovering from the effects of the winter of 1889, when dozens of Stonechats were picked up dead. Possibly it suffered also in parts of Mid and South Wales. I did not hear a single Chiffchaff, and Mr. Raeburn does not appear to have noticed it (in May). But my companion observed one, and tells me he heard some in April. Yet it could hardly have been present and have become silent in June, for here in Oxon it sings on into the latter part of July. Perhaps the April birds moved on, though I cannot imagine why they should do so. I found the Chiffchaff common in North-west Shropshire, on the Welsh borders, in May, 1888, and have heard it on the Anglesea side of the Menai Straits in July. Mr. Rawlings notes it as common. I did not see the Nuthatch, a pair of which Mr. Raeburn found nesting; nor does Mr. Rawlings include it in his list. In Shropshire, near the Welsh borders, I have found it common in a well-planted park. The distribution of many of our small birds in Wales and the border counties is evidently very local, and it would be an interesting study to work it out. The Lesser Whitethroat must be a rare bird in Wales. Neither Mr. Raeburn nor I observed it, and it is either not found or extremely rare in Pembrokeshire, according to Mr. Mathew. But, curiously enough, Mr. Rawlings is able to include it in his list, as "much rarer" than the Common Whitethroat. Perhaps it is spreading from Salop to North Wales. I observed it at Ellesmere in May, 1888, and the late Mr. Beckwith wrote of it as common in that county, it having increased greatly of late years. The Green Woodpecker was not noticed by me, and Mr. Raeburn only heard it once in Radnorshire. This, again, is curious, when we consider what a noisy bird it is, and that I made the following note about it in Merionethshire, in October, 1884:—"Quite common in the woods, and I observed it even in the hotel garden." In Mr. Rawlings' list it is entered as "common." I did not expect to find many House Sparrows when I saw what the country was like, and I was not disappointed. We saw none until we approached a town again. But our landlord said a few came in harvest; I suppose to help him get in his little patch of corn! Mr. Rawlings omits the name from his list altogether. This is, possibly, an oversight. I found very few in Merionethshire in October, 1884, and those only about farms. There was no ground suitable for river warblers in the part of Carmarthen-

shire explored. But as Mr. Rawlings has an interesting note about the Grasshopper Warbler, to the effect that he first observed it six years ago, and that it is increasing annually, I may mention here that I observed it in May, 1888, on Whixhall Moss, a detached portion of Flintshire.

Here is my list; it includes fifty-four species, while Mr. Raeburn's includes sixty-one:—

Turdus viscivorus; *T. musicus*; *T. merula*.

T. torquatus.—A male, which strung together a few wild notes, and a pair, on rocky slopes. Bill of male dusky yellow.

Saxicola œnanthe.—Very numerous.

Pratincola rubetra.—Only one.

Ruticilla phœnicurus.—Quite common. Seen up the wooded heights to some distance; also on rocky faces to quite 1000 feet, if only there was a scrubby thorn or other bush, and reminding one of the Black Redstart in the Alps. The Redstart is unknown, or extremely rare, in Pembrokeshire (Mr. Mathew). From what little I have seen of that county I should expect many woodland species to be absent, as my remembrance is of a dreary, rather treeless country. But the Redstart is increasing so in some places that it may push its way into any suitable spots there may be in Pembrokeshire. In Shropshire Mr. Beckwith noted it as very locally distributed. I saw it at Shrewsbury and near the Black Mere in May, 1888, but my host considered it quite uncommon then. I do not know if it is more numerous now, but Mr. Raeburn found it abundant in most of the localities in Mid-Wales he visited, and Mr. Rawlings records it as very common in Merionethshire. Mr. Raeburn must have overlooked this when he stated (p. 406) that the authorities were silent as regards this bird in North Wales.

Erithacus rubecula.

Sylvia cinerea.—Fairly common.

S. atricapilla.—Two or three.

S. hortensis.—Several observed; in song. Extremely rare in Pembroke (Mr. Mathew). Fairly distributed (Mr. Raeburn). Rarer than the Blackcap (Mr. Rawlings).

[*S. curruca*.—Capt. Swainson writes that it is “pretty evenly distributed in suitable places in the neighbourhood of Brecon,” and that he could point to at least a dozen different localities where it can be heard, and perhaps seen, near Brecon (Zool. 1891,

p. 356). There is a record of its breeding in one instance in Carnarvonshire (*loc. cit.* 1893, p. 395)].

Phylloscopus rufus.—*Vide supra*.

P. trochilus.—Abundant, and singing all day the full song. In Oxon they were singing chiefly in the early morning when I left. I found it very abundant in north-west Salop in May, 1888, and saw many in the birches and alders on the edge of Whixhall Moss.

P. sibilatrix.—Abundant, especially in the oak-woods. Mr. Rawlings records it as plentiful. Not in Pembrokeshire, or extremely rare there (Mr. Mathew).

Accentor modularis.—Only once seen by my companion.

Cinclus aquaticus.—On a tributary stream.

Acredula rosea.—A family party.

Parus major; *P. palustris*.

P. ater britannicus.—The commonest Titmouse.

Troglodytes parvulus.—Seen in the wildest places.

Motacilla lugubris.

Anthus pratensis.—Common. Found high up on the face of the hills and among the ling and rough grass at the top.

A. trivialis.—Common; extended some way up the sides of the hills.

Muscicapa atricapilla.—Apparently common. I saw two males, a pair, and two females. Here, as elsewhere, they take most of their food on the ground. But they occasionally take a fly on the wing, and sometimes among the branches of the tree they are perched upon. The song to me has generally a resemblance to that of the Whinchat, but is rather clearer and more sprightly; this is sometimes preceded by several notes, about four of them, somewhat like a Coal Tit's "if-he." Sometimes the song contains two or three notes a little like those in the first part of the Reed Bunting's chant; but these also are more sprightly and clear. The alarm-note of the female is a loud, full, and hard "chip," repeated continuously at a moderate pace. Captain Swainson remarks upon the similarity of some notes in the song to the spring note of the Coal Tit (*Zool.* 1892, p. 423).

Hirundo rustica.—Not very many. Seen some way up the hillsides.

Chelidon urbica.—A few seen about the rocky parts.

Cotile riparia.—Fairly common. Apparently breeds on the

hill-sides, as I saw some flying in that direction after picking up feathers in a farm-yard.

Carduelis elegans.—One pair in the lower valley.

Passer domesticus.—*Vide supra*.

Fringilla cœlebs.—Very common, and sang the Wood-Wre prelude almost entirely or exclusively.

Pyrrhula europæa.—Once, in the lower valley.

Emberiza citrinella.—Some.

Sturnus vulgaris.—Only two or three seen.

Garrulus glandarius.—A few in the woods.

Pica rustica.—Three or four seen.

Corvus monedula.—Some about a small solitary church.

C. corone.—Common, especially on the hills.

C. frugilegus.—Some.

C. corax.—Twice saw a pair, and once a single bird; always on the hills.

Alauda arvensis.—Not uncommon on the moorland at the top of the hills.

A. arborea.—Apparently not uncommon in the lower valley. Observed two males singing in two low oaks, one on each side of a narrow lane. Two others seen. To my mind the song of this bird yields to none for beauty. For softness, sweetness, and restfulness it takes the palm. In delivery it is gentle and leisurely. Mr. Raeburn did not meet with the Wood Lark, and at Barmouth it has only occurred in winter (Zool. 1894, p. 331).

Cypselus apus.—Fairly common. Often overhead when I was on the highest ground.

Caprimulgus europæus.—Heard "churring" loudly on one wet evening.

Cuculus canorus.—Heard frequently.

Syrnium aluco.—One seen in a wood; heard hooting at night also.

Buteo vulgaris.—Several seen.

Milvus iclinus.—One seen.

Falco tinnunculus.—Several seen.

Ardea cinerea.—A magnificent old bird passed over my head, low down, as I was searching for a Sandpiper's nest one day. I never (except at the nest) had one fly so close to me before. I fancy he did not see me; but I was in the open—merely on a shallow underbank of the river, and I am sure no Oxfordshire

Heron would have failed to see me. Perhaps these Welsh birds are unsophisticated. I saw one more.

Columba palumbus.—Fairly common.

C. œnas.—Seen about the rocks, high up.

Crex pratensis.—One heard in the lower valley.

Totanus hypoleucus.—Several pairs. Very tame. They had probably hatched their young. I had seen tiny young following the old birds on the banks of the Wye in Brecon just before.

NOTES AND QUERIES.

MAMMALIA.

Wild Cat, Polecat, and Marten in Cardiganshire.—In November, 1893, a large cat was sent to Mr. Hutchings, of Aberystwith, to be preserved. It was shot upon the estate of Mr. T. M. Davies, of Pen-y-bont-pren, Talybont, and is now in his possession. I examined it in the full expectation of finding it to be a house-cat which had taken to the woods, or the descendant of one; but after careful comparison with books of reference, now I believe it to be a genuine example of *Felis catus*, as it appears to me to possess all the characteristics of that animal. It has the heavy, muscular figure, short limbs, and broad flat head of the wild species. Length, as stuffed, 30 in., of which the tail is only 8½ in. It is grey in colour, whitish beneath, with an irregular dark line, or perhaps two, extending along the back, and with regular transverse bands of black on the sides; yellowish about the face, tawny on the inner side of the legs, and feet black underneath. The tail is bushy and does not taper, ringed, and tipped with black. The keeper who shot it sent it to be preserved, as being quite unlike any cat that he had ever killed previously. I do not know the present status of the Wild Cat in Wales, and can only hope that the example referred to may be seen by some one better acquainted with that species than I am. But it is only comparatively recently that game-preserving has become at all general in the district in question, and it is not at all impossible that an animal, even of this size, might remain undetected. The Polecat, *Mustela putorius*, is still so frequently met with that its remains are to be seen upon every keeper's wall, and those sent into Aberystwith to be preserved would probably average one a week throughout the year. The Marten, *Martes sylvatica*, on the other hand, is all but extirpated. The only recent occurrence that I know is that of one in the possession of Capt. Geo. Weir Cosens, of Llanbadarn, which was sent to him about 1882, from a grouse-

moor on the slopes of Cader Idris, where it had lived for some years and caused much damage.—J. H. SALTER (University College, Aberystwyth).

Albino Weasel.—Referring to the enumeration of albino specimens of the Common Weasel which have been hitherto recorded (Zool. 1894, p. 449), I may mention that some time since Mr. J. Pettitt, taxidermist, of Colchester, showed me a specimen which had been killed near that place about Dec. 20th, 1892. It was pure white, with pink eyes, and the flesh was of the usual pale colour.—MILLER CHRISTY (Pryors, Broomfield, near Chelmsford).

CETACEA.

Hump-backed Whale on the Lincolnshire Coast.—The members of the family *Balaenopteridæ*, of which there are two well-marked genera, comprising the thick-bodied, large-finned Humpbacks (*Megaptera*), and the long, slender, small-finned Rorquals or Finner Whales (*Balaenoptera*), are distinguished by the longitudinal pleats or folds in the skin of the throat and belly, and by the possession of a dorsal fin. The head is relatively smaller than in the Right Whales, and the jaws are less arched; the baleen is short and twisted, the vertebræ of the neck are usually separate, that is, not ankylosed, and the flipper has only four fingers. The Rorquals, or some of them, are not very uncommon off our northern coasts, but the Hump-backed Whale (*Megaptera longimana*) is of such rare occurrence that, until the present year, four examples only have been recorded to have been met with in British waters since 1829, when the first was cast ashore near Newcastle-on-Tyne, in September of that year (Johnston, Trans. Newcastle Nat. Hist. Soc. vol. i.). No other example was met with until 1863, when a second was captured in the estuary of the Dee, and its skeleton having been prepared, is preserved in the Liverpool Museum. Again twenty years elapsed before a third was recognized, this time at the mouth of the Tay, in the winter of 1883—84 (Struthers, Journ. Anat. & Phys., 1887; and Flower, 'Mammals, Living and Extinct,' 1891, p. 242). After another interval of ten years, a fourth came ashore on the Enniscrone Sands, Co. Sligo, on the 21st March, 1893 (Warren, Zool. 1893, p. 188). We have now to chronicle the capture of a fifth example of this whale, which was stranded at Chapel, on the coast of Lincolnshire, about seven miles north of Skegness, during the first week of September last. Its identity was established by Mr. G. H. Caton Haigh, who on hearing of its capture went to see it, and found it in process of being cut up. He reported it to be a small specimen of its kind, about twenty-five feet in length, with a flipper seven or eight feet long and perfectly white; the rest of the body black, excepting a few white marks on the under side. Mr. Cordeaux, who reported the occurrence ('Naturalist,' 1894, p. 286), has referred to only three previous instances of its capture in the British Islands, and has

consequently overlooked one of the four above mentioned. Considering that it is a common species in the North Atlantic, between Norway and Greenland, it is curious that it has not been more frequently detected in British waters. It is of course possible, and indeed probable, that other examples have been captured or stranded, and cut up before any competent zoologist could see and identify the species. As regards the dimensions of the Hump-backed Whale, an adult specimen is said to attain a length of 45 to 50 feet. If so, the individuals which have come under the notice of naturalists in this country seem to have been all more or less immature. The Newcastle specimen was 26 feet in length, the Lincolnshire specimen 25 feet, the Sligo specimen 29 feet, and the Dee specimen 31 feet 4 inches. To judge from the dimensions given by those who have recorded these examples, the figure in Bell's 'British Quadrupeds' (which is copied from Rudolphi's original figure in the Memoirs of the Berlin Academy) conveys an erroneous impression of the proportions of the animal. In nature the body is very clumsy, and so thick as to look quite out of proportion to its length, being probably between 20 and 30 feet in circumference, according to Mr. Warren, who examined the Irish specimen. Again, the tail is represented as much too small in proportion to the length. The late Mr. T. Moore, of the Liverpool Museum, who measured the Dee specimen, found the extreme width of the tail to equal the distance from snout to flipper, namely, 11 feet; whereas in Bell's figure (copied from Rudolphi) the extreme width of the tail is not 4 feet. We want new outlines of this species, drawn from the latest statistics.—J. E. HARTING.

BIRDS.

Notes on Grouse.—On reading the recently published volume on the Grouse in Longman's 'Fur and Feather' Series, I was struck with the reference to a bird in my uncle's possession which Mr. Macpherson has decided to be a hybrid between Red Grouse and Black-game (*tom. cit.* pp. 62, 63). I am naturally familiar with the specimen in question, which I had always regarded as a barren grey-hen assuming male plumage. I refrained, however, from any expression of opinion, until I had had another opportunity of examining the bird. I am now writing this in the same house with it, and, after a careful examination, I must say I cannot find any grounds for altering my former opinion. The size of the bird, the appearance of its feet and head, exactly correspond with those of a normal grey-hen purposely put in the same case with it. The claws, and the serrations on the side of the toes, do not show the least tendency to resemble the same parts in a Red Grouse; neither is there a trace of Grouse-like feathering on the toes themselves. Nor can I detect any distinctive characteristics of Red Grouse plumage on the body. I have seen a good many examples of this abnormal female plumage in the

Capercaillie, Black Grouse, and Pheasant (all polygamous birds), at Christiania and elsewhere, and remain firmly of opinion that this present instance must be classed amongst them. I may add that there are no grounds (based on dissection) for calling it "a fine male," else I could only urge my point with extreme hesitation. It came from somewhere near Longtown, close to the border, and was bought at a game-dealer's shop in Carlisle by my uncle; and the sex, I regret to say, was not ascertained. I will send a description (as close as the case it is in will permit), if the Editor thinks it would be of interest. I feel compelled to take exception, also, to the suggestion that Grouse have not been known to undertake regular periodical migrations (*tom. cit.* p. 40). Grouse from different moors vary quite sufficiently in plumage and size to make it hardly worth while to wait for "marked birds." May I call Mr. Macpherson's attention to an undoubted case in his own county of Cumberland, mentioned in Clarke and Roebuck's 'Handbook of Yorkshire Vertebrates' *sub voce* "Grouse." I have examples in my collection of Cleveland Grouse shot (by myself) on a Cumberland moor, where they make their appearance regularly every year. Mr. Macpherson would do well to study the extent of this phenomenon on other moors as well; it would be likely to lead to results of great interest. Lastly, will Mr. Macpherson pardon me if I venture to suggest that it would have been well not to allow such expressions as "using his spurs" (p. 28), "with his spurs" (p. 29), to pass without some sort of protest.—

HENRY H. SLATER.

[To this communication Mr. Macpherson sends the following explanation.]

"Perhaps I may venture to supplement Mr. Slater's note with the necessary reminder that I had no opportunity myself of forming an independent opinion on the bird, which I do not remember exactly. The owner of the bird, Mr. Horrocks, is a good sportsman and naturalist, who had the bird in the flesh, and I accepted his *ipse dixit* for whatever it might be, considering at that time that he knew far more than I did about game-birds, which I had not then studied at all. Mr. Slater took no exception to the original record, so that I assumed that he concurred in his uncle's opinion, and I therefore copied the original record on two subsequent occasions. I was, of course, anxious to see the bird, but ill-health prevented my availing myself of its owner's kind invitations to his house. I am often asked to investigate the local migrations of Grouse in the North of England. It is useless, however, to attempt any enquiry of the kind, unless several owners or lessees of moors can be prevailed on to attach metal labels to a number of small Grouse. Even if such a course were seriously undertaken for a single season, we should learn a good deal. In the meantime, it seems to me that the mere theories of keepers on the subject are valueless. Nothing short of a system of marking birds, carried out on a

sufficiently large scale, can clear the matter up."—H. A. MACPHERSON (Victoria Place, Carlisle).

Black Guillemot in Merionethshire.—Amongst the sea-birds which fall victims to rough weather on the Welsh coast I found, on Nov. 11th, the much-damaged remains of a Black Guillemot, *Uria grylle*, washed ashore on the Traeth Bach, near Towyn-y-Penrhyn. Though, no doubt, frequently met with in former years, I know of no recent record of this species in Merionethshire.—J. H. CATON HAIGH.

Pomatorhine Skua in Mid-winter.—The great gale of December 22nd drove a fine Pomatorhine Skua up the river Eden, and it was shot from the Carlisle race-course. I have never before met with this Skua so late in the season.—H. A. MACPHERSON (Carlisle).

The Oystercatcher in Warwickshire.—The Oystercatcher, *Hamptopus ostralegus*, is by no means a common visitor to the Midland Counties, nevertheless it occurs irregularly from time to time. In an old list in my possession of the birds recorded for Sutton Coldfield Park (a park of some 2800 acres, about 180 of which is water, distributed over six pools), the Oystercatcher is mentioned with doubt. On August 24th, 1890, I heard the whistle of these birds at dusk, from off the muddy flats of Longmore Pool. The next day they were still there, and five in number. On November 25th last, a single bird I found haunting the gravelly sides of Powell's Pool, both of which pools are within the boundary of the Park. Some other waders, such as the Green and Common Sandpipers, Ring Plovers, and Dunlins, constantly occur, but the Oystercatcher is, I think, of sufficiently rare occurrence so far inland as to be worth recording.—J. STEELE ELLIOTT (Dixon's Green, Dudley).

Nesting of the Lesser Spotted Woodpecker near Bath.—A few months ago a friend showed me his collection of eggs in which he had some eggs of the Lesser Spotted Woodpecker, *P. minor*. Being naturally curious to see the nest (or what remained of it) from which the eggs had been taken, my friend took me lately to see it. After walking out of Bath for about two miles, we came to a long avenue of beech-trees. In one of these, a very decayed tree, the nest was bored about nine inches into the trunk. The entrance was, so far as I could judge, between seven and eight feet from the ground. The birds had commenced another boring higher up the tree, but they left it unfinished. I think the wood was softer lower down the trunk. From this nest four eggs were taken, about the end of June. The tree was close to the roadside, and on being struck with a stick the hen bird flew off the nest, and both birds were seen about the adjoining trees. I saw a female Lesser Spotted Woodpecker in the flesh, which had been shot about a week ago in one of the suburbs of Bath, but I have never observed one alive in the wild state.—C. B. HORSBRUGH 4, Richmond Hill, Bath).

Swallows in December.—In 'The Zoologist' for Feb., 1881, details were given of the occurrence of Swallows and Martins in the South of England on the 7th, 11th and 18th of December, 1880. In December, 1885 (about the third of the month), a Swallow was seen on Clifton Down, close to the river, as reported by Mr. E. Clutterbuck (Zool. 1887, p. 269). In December, 1891, Swallows were seen at Retford on the 3rd, Norwich on the 10th, and Findhorn Bay, N.B., on the 12th, while House Martins were observed at Norwich on Dec. 3rd. (See an article on "Belated Swallows" in 'The Field' of Jan. 30, 1892.) And now once more, in December, 1894, we have to record the appearance of a few loiterers, or individuals of late broods, which were unable apparently to join the majority on their autumnal migration. On Dec. 1st, as reported by the Rev. Prebendary Gordon, of Harting Vicarage, Sussex, a Swallow was seen at Fishbourne. In Gloucestershire on the same day, Mr. C. H. Witchell saw a young Swallow flying about at Stroud, although in the shade the ground was white with frost. In Lincolnshire, on the same day, as well as on Dec. 2nd, a Swallow was seen by Mr. S. E. Harrison, of Roughton, "flying to and fro over his farmyard, and about the pond and buildings, as in summer." On the 3rd and 5th two or three were observed at Bognor. On Dec. 4th Mr. A. B. Percival reported that he had just examined, "in the flesh," a young House Martin, which had been obtained near Derby. On Dec. 5th a House Martin was shot by Mr. H. Butler, of Bournemouth, at Whitecliff Farm, Swanage. On Dec. 6th Mr. T. Lewis, of Brook Villa, Falmouth, saw eight or ten Swallows skimming about, and watched them for an hour or more. The circumstance was considered the more remarkable because the weather for some time had been cold and the wind north-east. On the 7th three Swallows were noticed at Chichester, and one at Bognor. On the 8th and 10th a few House Martins appeared at Fishbourne, and on the 11th one was seen at Arundel, where on the 15th a solitary Swallow was noted. At Sittingbourne, Kent, on the afternoon of Dec. 12th, one of these birds was observed flying to and fro over some fields, actively engaged, apparently, in hawking for insects. The day was very mild, though there was not much sunshine, and the air seemed full of insects. At Fishbourne, in Sussex, a solitary Martin was seen on the 17th, and three more on the 22nd. Finally, on the 23rd of the month, the latest report of a December Swallow reaches us, also from Sussex, a single bird having been seen on that date at Chichester. With these and other instances before us, reported by independent witnesses in different parts of the country, it is clear that in future it will not do to write about the late stay of Swallows in November, although it is of course true that the majority of these birds quit our shores even before November has set in.—J. E. HARTING.

Ivory Gull and Dusky Shearwater in Iceland.—I have the pleasure of adding two more birds to the Iceland list, not hitherto (so far as I am

aware) recorded in it. I heard some years ago that a small white gull came occasionally with the Greenland ice to the north coasts of Iceland, at the same time as the Polar Bears do. My collector procured one for me after a good deal of trouble, and it is, as I suspected, an Ivory Gull, *Pagophila eburnea*, a fine adult bird. On July 25th last, about sixty miles S.E. from Eskifjördr, a black petrel flew close to me (within ten yards, certainly) as I was standing on the deck of the Danish mail steamer 'Thyra,' and continued to circle round the ship for some time. I had no hesitation in putting it down as the Dusky Shearwater, *Puffinus griseus*. I described it in my notes at the time as something short of a foot in length; expanse of wing nearly two feet; colour sooty black; bill slenderer than a Fulmar's and much hooked. I saw another in the Axarfjördr (N.E. coast of Iceland) two days later; and an observant fellow-passenger, to whom I had pointed out these two on the wing, assured me afterwards that he had seen another on the west coast. There is nothing improbable in the occurrence of the Dusky Shearwater in Iceland, and I expect that further investigation will show that it breeds there in small numbers. I may add that I have been (for some eight years) collecting materials for an annotated list of Iceland birds, with the recent additions, and that any information on the subject from brother ornithologists will be most welcome. But I shall have to make yet another personal visit at least to the island before I shall be in a position to finish it.—HENRY H. SLATER (Thornhaugh Rectory, near Wansford).

Hybrid Swans.—Some three years ago, Mr. Assheton Smith, of Vaynol Park, Bangor, received in exchange from the Zoological Society's Gardens, Regent's Park, a female American Trumpeter Swan, *Cygnus buccinator*. This bird was placed upon a pool with other water-fowl, amongst which was a male Mute Swan, *C. olor*, with which in course of time it paired. Since then three broods of hybrid cygnets have been reared, and during a visit to Vaynol in October I had daily opportunities, for a fortnight, of inspecting them. The cygnets of 1894 were, of course, still in the grey immature plumage, but the young birds of the previous brood were then almost as white as their parents. In the carriage of the head and neck they resemble the female parent, *C. buccinator*, and the bill (which in the latter is wholly black) is black from the base to within an inch or so of the extremity, where it then becomes flesh-colour. There is, moreover, no prominent tubercle at the base of the bill, which is so conspicuous in the Mute Swan. The period of incubation was not precisely noted, but it was believed to be rather less than six weeks, the number of the brood being five in 1893, and six in 1894. As the American Trumpeter Swan has long been introduced into this country, and is even said to have been met with in a wild state on the Suffolk coast ('Handbook of British Birds,' p. 155), it is not surprising that, under favourable conditions, it should sometimes breed here; but I

have not found any instance on record of its interbreeding with *C. olor*.—
J. E. HARTING.

Ornithological Notes from Sussex.—In the first week of October two adult Red-throated Divers, with red throats, were shot off the Fish-market, Hastings. About October 18th an adult female Long-tailed Duck was shot from a pond at Ashburnham, near Battle, about seven or eight miles from the sea. On Oct. 22nd I had offered to me three young Sheldrakes, shot out of a flock of five on the previous day at Pett Level, near Winchelsea. On the same day a young male Shag, *Phalacrocorax cristatus*, was shot at the bottom of Ecclesborne Glen. On Nov. 8th I had brought to me a Fork-tailed Petrel, washed up dead opposite the Marina at St. Leonard's; its gizzard contained a small seed only.—G. W. BRADSHAW (Hastings).

MOLLUSCA.

Colpodaspis pusilla on the Devonshire Coast.—At a meeting of the Zoological Society, held on Nov. 20th, Mr. W. Garstang read a paper on this rare Gastropod mollusc, a specimen of which had been found by him near Plymouth. The anterior part of the foot was not really bifid, as stated by Sars, but possessed a pair of the large prolongations of its anterolateral angles, analogous to the anterior pedal cornua of many *Æolids*. In this case, however, they were probably to be regarded as homologous with the pleuropodial expansions of the Tectibranchia. The bulloid shell, the radula, and the posterior appendage of the mantle pointed to the close affinity of *Colpodaspis* with the Cephalaspidea; but the great extent of the mantle, the small head, and the grooved tentacles were important and primitive characters which it shared with the Notaspidea. Whether *Colpodaspis* was an immature stage of some *Philine*-like genus or not, it furnished an indubitable connecting link between these two great subdivisions of the Tectibranchia.

SCIENTIFIC SOCIETIES.

LINNEAN SOCIETY OF LONDON.

December 6th, 1894.—Mr. C. B. CLARKE, F.R.S., President, in the chair.

Mr. Walter Tothill was elected a Fellow.

Mr. E. M. Holmes exhibited and made remarks upon a small collection of Japanese Marine Algæ, some of which were of considerable rarity in European collections.

Prof. D. Campbell brought forward some illustrations of the relations of Vascular Cryptogams as deduced from their development. His remarks, which were listened to with great attention, gave rise to an interesting

discussion, in which Prof. Bower, Dr. D. H. Scott, Mr. Carruthers, and Prof. Marshall Ward took part.

"A new revision of the *Dipterocarpeæ*," was the title of a paper by Sir Dietrich Brandis, K.C.I.E., who gave an excellent account of this order of forest trees, and their structure and mode of growth, together with a survey of the literature relating to them, and a clear exposition of his views concerning classification. He pointed out that the order *Dipterocarpeæ* consists almost entirely of large trees which do not flower till they have attained a great size, with a spreading crown on a branchless stem often more than 100 feet high. Hence it is difficult to obtain complete specimens in flower and fruit; and this explains why a large proportion of the genera and species have only of late years become accurately known. Notable species are the Sâl tree of India, *Shorea robusta*, great forests of which extend along the foot of the Himalayas and in Central India; the Eug tree, *Dipterocarpus tuberculatus*, of similar growth, in Burma; and others found in Cochin China and Borneo.

Dec. 20th.—Mr. C. B. CLARKE, F.R.S., President, in the chair.

Mr. Peter Ewing, of Glasgow, was elected a Fellow.

Mr. W. B. Hemsley exhibited a series of specimens and figures illustrating the parasitism of *Loranthus aphyllus* and other plants from the Herbarium, Kew.

Mr. J. E. Harting exhibited a specimen of a small Siberian Warbler, *Phylloscopus superciliosus*, which had been obtained near Beverley, Yorkshire, in October last, and made some remarks on its haunts, habits, and migrations, and upon the previous instances which had been noted of its accidental occurrence in the British Islands.

Mr. H. M. Bernard gave the substance of a paper on the spinning glands in *Phrynus*, not previously known, and described their position and their morphological importance in Arachnidan phylogeny. The penis was described as a pair of rudimentary filamentous appendages of the genital segment, and consequently of importance as bearing further testimony to the view that the limbs on the abdomen of the ancestral form were not plates as in *Limulus*, but appendages like those on the thorax. The presence of these limbs explains the curious genital operculum of the *Pedipalpi*, which is not a primitive feature derived from Eurypterine ancestors, as some would maintain, but a purely secondary specialization acquired within the Arachnid phylum.

A paper was then read by Mr. Percy Groom, entitled "Contributions to the Knowledge of Monocotyledonous Saprophytes," or plants which are dependent for their existence on the presence in the substratum of decaying organic matter. He observed that, like parasites, they may be divided into those which possess chlorophyll (*hemisaprophytes*) and those which have none

(*holosaprophytes*). Hitherto very few experiments, he said, had been made on *hemisaprophytes*, and hence our acquaintance with them was largely speculative. The remarks which he had now to offer referred almost entirely to *holosaprophytes*, or at least to plants with very little trace of chlorophyll. After an interesting discussion, in which Sir D. Brandis, Mr. H. N. Ridley, and others took part, the meeting adjourned to Jan. 17th.

ZOOLOGICAL SOCIETY OF LONDON.

November 20th, 1894.—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 October, and called special attention to a pair of Somali Ostriches, *Struthio molybdophanes*, from Somaliland, purchased Oct. 26th. This was the first pair of the blue-skinned form of Ostrich, which inhabits Eastern Africa, that had reached the Society's Gardens.

On behalf of Dr. C. Kerbert, Director of the Zoological Gardens, Amsterdam, a photograph was exhibited of a Sumatran Goat-Antelope, *Nemorhædus sumatrensis*, living in those Gardens.

Mr. R. Lydekker exhibited and made remarks on a model and a photograph of a bird's egg from Patagonia, supposed to be the egg of an undescribed species of Ratite bird.

Mr. W. B. Tegetmeier exhibited and made remarks on the felted covering of a long-haired Angora Rabbit, which had shed its entire coat in one piece.

The President exhibited a specimen of a Hairy Armadillo, *Tatusia pilosa*, obtained by J. Kalinowski in the Maraynioc district of Central Peru.

Mr. F. G. Parsons read a paper on the anatomy of *Atherura africana*, compared with that of other Porcupines. In addition to the points mentioned by Drs. Gray and Günther as differences between the skulls of *A. africana* and *A. macrura*, the arrangement of the fronto-nasal suture, the position of the maxillomalar suture, and the frequent presence of an *os anti-epilepticum* were noticed. The presence of intercentra was also drawn attention to. The muscles in the main bore out the remarks already published by the author in his paper on "The Myology of the Sciuromorphine and Hystricomorphine Rodents." The liver agreed with that of *Hystrix cristata* and *H. javanica* in having the left central lobe divided into two. There was no gall-bladder. The lungs were specially remarkable for being divided up into a large number of lobes, there being 34 lobes on the left side and over 40 on the right.

A communication from Mr. J. T. Cunningham treated of the significance of diagnostic characters in the *Pleuronectidæ*. In this paper the specific and generic characters of the so-called Top-knot (*Zeugopterus*) were first

considered. The principal generic characters were the perforation of the gill-septum, found also in *Arnoglossus megastoma*, and the prolongation of the dorsal and ventral fins on to the right side at the base of the tail. The marked peculiarity of habit was that of adhering to vertical surfaces. It was shown that this was independent of either of the characters mentioned, and was due to the pumping-action of the longitudinal fins and their muscles posteriorly, the enlargement of those parts being also a generic character. No evidence of the utility of the specific characters could be discovered. The characters of other *Pleuronectidæ* were similarly examined, and the conclusion reached was that there are two kinds of characters, the adaptive and the morphological.

Mr. A. Smith Woodward read a description of the so-called Salmonoid fishes of the English Chalk, dealing with the osteology of *Osmeroides lewesiensis*, *Elopopsis crassus*, and *Aulolepis typus*. He directed special attention to three features in the head of the genera to which these species are referred, namely: (1) the exclusion of the supraoccipital from the cranial roof by the union of the parietal bones in the median line; (2) the overlapping of the arched maxilla by two large supramaxillary bones; and (3) the presence of a large gular plate. All these characters separated the fishes in question from the typical *Salmonidæ*, while the first and third distinguished them from typical *Clupeidæ*. All three genera should be associated with the existing *Elops*, *Megalops*, and their allies.

Mr. W. Garstang read a paper on the Gastropod *Colpodaspis pusilla* of Michael Sars, describing a specimen of this rare mollusc found by him at Plymouth in the early part of the year. (See p. 25.)

A communication from Mr. A. D. Bartlett gave an account of the recent occurrence in the Society's Menagerie of a case of one Boa swallowing another of nearly equal size.

A communication from Prof. R. Collett contained a description of a new Agonoid fish from Kamtschatka proposed to be called *Agonus gilberti*.

Dec. 4th.—HENRY SEEBOHM, F.L.S., F.Z.S., Vice-President, in the chair.

The Secretary read a report on the additions made to the Society's Menagerie during the month of November, and called attention to the Surinam Water-Toads, *Pipa americana*, presented by Mr. F. E. Blaauw; to a fine example of Pels' Owl, *Scotopelia peli*, from Sierra Leone, presented by the Hon. C. B. Mitford, Deputy-Governor of the Colony; and to two Tree-Kangaroos from Queensland, received in exchange.

A communication was read from Mr. T. Manners Smith on some points in the anatomy of the Water-Mole, *Ornithorhynchus paradoxus*, relating chiefly to the muscular anatomy and the trunk-arterial system.

Mr. F. E. Beddard read a paper on certain points in the visceral anatomy of the same animal.

Mr. Boulenger read a "Second Report on Additions to the Lizard Collection in the Natural History Museum." It contained a long list of species previously unrepresented in the collection, specimens of which had been acquired since the appearance of the first Report, published in the 'Proceedings' of the Society for 1890. This list was supplemented with the descriptions of several new species.

Prof. F. Jeffrey Bell called attention to the acquisition by the Natural History Museum of some specimens of remarkable Corals of great size from North-west Australia, of which he showed some photographs.—P. L. SCLATER, *Secretary*.

ENTOMOLOGICAL SOCIETY OF LONDON.

December 5th, 1894.—H. J. ELWES, F.L.S., F.Z.S., President, in the chair.

Messrs. E. A. Bowles, M.A., of Myddelton House, Waltham Cross; E. C. Cotes, of the Indian Museum, Calcutta; Wolley-Dod, of Calgary, Alberta, Canada; Joseph W. Green, of West Lodge, Blackheath; Henry Keeble, of 10, Coleman Street, E.C.; and Thomas Turner, of Collumpton, Devon, were elected Fellows of the Society.

Mr. F. Merrifield exhibited hybrids belonging to the genus *Saturnia*, obtained by Dr. Standfuss, of Zurich, viz., a male and female hybrid from a male of *S. pavonia* and a female of *S. pyri*, to which he had given the name of *S. emiliae*; also hybrids from what Dr. Standfuss described as "a male of *Callimorpha dominula* var. *persona*" (received from Tuscany) and a typical form female of *C. dominula*, to which he had given the name of *C. romanovi*. Mr. Merrifield remarked that the so-called var. *persona* differed entirely from the type of *C. dominula*.

Mr. J. W. Tutt exhibited and read notes on specimens of a very small form of *Euchloë*, taken in Shropshire by the Rev. F. B. Newnham, who was of opinion that it was distinct from *E. cardamines*. He pointed out that it was much smaller than the latter species, and that the discoidal spot was placed, as in *E. turritis* and *E. gruneri*, at the juncture of the orange and white spaces, and not, as in *E. cardamines*, well within the orange tip. Mr. Tutt also exhibited and read notes on specimens of *Noctua dahlii*, from Cheshire, Essex, Yorkshire, Aberdeenshire, and other counties. The variation in the specimens was said to be partly due to sexual dimorphism, and partly to their geographical distribution.

Herr Jacoby read a letter received from Mr. Buxton Forman, one of the Assistant Secretaries of the Post Office, to the effect that the Postal Union had decided to make a rule not to allow natural-history specimens to be sent by sample post, which was intended for the transmission of *bona fide* trade-patterns or samples of merchandise, and consequently that the forwarding

of such specimens at the same rate would in future be irregular. Lord Walsingham stated that he had had a long correspondence with the Post Office authorities on the subject, and that the late Mr. Raikes, when Postmaster-General, promised him in 1891 that such specimens should, 'so far as the British Post Office was concerned, be transmitted at the same rates; and a letter to the same effect, from the late Sir Arthur Blackwood, when Secretary of the Post Office, was published in the 'Proceedings' of the Society for 1891.

Mr. C. G. Barrett exhibited, for Mr. A. J. Hodges, a specimen of *Hydrilla palustris*, from Wicken Fen; also specimens of *Caradrina ambigua*, from the Isle of Wight. He remarked that of the latter one specimen has the hind margin of the right fore wing indented, and the wing broadened as though from an injury to the pupa. In this wing the margins of the large orbicular and reniform stigmata had become so joined that the dividing lines had disappeared, and the stigmata were fused into one irregularly-formed blotch.

Mr. McLachlan exhibited, for Mr. G. F. Wilson, F.R.S., of Weybridge, a "grease-band" which had been tied round trees to prevent the females of *Cheimatobia brumata* from ascending the trunks for the purpose of oviposition; the band was thickly covered with the bodies of the females, together with a few males.

Surgeon-Captain Manders exhibited a pair of *Cheloni bifasciata*, from the Shan States, and called attention to the "assembling" habits of the male, some hundreds of which were attracted by the numerous females which emerged from the cocoons at sunset.

Mr. B. A. Bower exhibited a beautiful variety of *Zygæna lonicera*, Esp., having the spots confluent, taken at Chattenden Wood, North Kent, in June last; also a specimen of *Incurvaria tenuicornis*, Stn., taken at Chislehurst, in May, 1893.

Mr. H. Goss exhibited, for Mr. F. W. Urich, of Trinidad, a series of males, females, and workers of *Sericomyrmex opacus*, Mayr, a species of fungus-growing and fungus-eating ant.

Colonel Swinhoe read a paper entitled "A List of the Lepidoptera of the Khasia Hills," Part III.

Mr. C. J. Gahan read a paper entitled "On the Longicorn Coleoptera of the West Indian Islands."

Mr. F. W. Urich communicated a paper entitled "Notes on the fungus-growing and eating habits of *Sericomyrmex opacus*, Mayr."

Prof. E. B. Poulton read a paper, by Prof. E. B. Titchener, entitled "An apparent case of Sexual Preference in a male Insect."

The Rev. H. S. Gorham communicated a paper entitled "Notes on Herr A. Kuwert's 'Revision der Cleriden-gattung *Omadius*, Lap.'"—
H. GOSS & W. W. FOWLER, *Hon. Secretaries.*

NOTICES OF NEW BOOKS.

The Life and Correspondence of WILLIAM BUCKLAND, D.D., F.R.S., sometime Dean of Westminster, twice President of the Geological Society, and First President of the British Association. By his Daughter, MRS. GORDON. 8vo., pp. i—xvi; 1—288. London: John Murray. 1894.

DEAN BUCKLAND died in August, 1856, and shortly afterwards appeared a new edition of his 'Bridgewater Treatise' (on Geology considered in relation to Theology), edited by Professor Phillips. Prefixed to this edition is a Memoir of him by his son, the late Frank Buckland, and there is of course a notice in the 'Dictionary of National Biography;' but these articles do not convey more than an outline of the career of this distinguished man of science, and it has remained for his daughter, Mrs. Gordon, to give us a much fuller account of his life and work in a volume of nearly 300 pages, which is now before us.

Dean Buckland was a very remarkable man, whose influence was felt far beyond the University whose professorial chair of geology he occupied; far even beyond the limits of the British Islands, as shown (in the appendix to this volume) by the long list of foreign scientific societies of which he had been elected a member. So many years, however, have elapsed since his death that probably few persons beyond those who were personal friends and acquaintances have any adequate notion of the nature of the services rendered by him to posterity.

He was an eminently practical geologist, always turning to good account the scientific knowledge which he acquired. He lost no opportunity of pointing out the importance of applying a knowledge of Geology to the improvement of agriculture, and time has shown not only that his suggestions were valuable, as being founded on scientific grounds, but that many persons have made fortunes by adopting them. To take the case of phosphates, now so largely employed as manure: Dr. Buckland had shown that the so-called *coprolites* found in various rocks could not be anything but the fossil dung of extinct animals, as the intestinal marks were still visible. It was argued from this that they ought

to contain abundance of phosphate of lime, the most useful manure for exhausted soil. This proved to be true, and was the origin of the great industry of superphosphates which has done so much for agriculture. Dr. Daubeny thereupon suggested that when coprolites failed, mineral phosphates, such as he had seen in Estramadura, might be utilized, and from this source an enormous trade has since been developed.

Drainage was another matter to which Dr. Buckland paid special attention, and with remarkable results. By judicious draining he arrested the spread of ague in the villages on Otmoor, and materially improved the health of the inhabitants, in whom he was originally led to take an interest by reason of many of them being tenants of lands belonging to the Dean and Chapter. On coming into residence as Dean of Westminster, he at once had a great task before him in the cleansing of the old sewers (from which something like 400 cubic yards of foul matter was removed), and in the introduction of pipe drainage, which was the first of its kind ever laid down in London.

Other sanitary reforms followed, particularly in regard to the dwellings of the poor in Westminster, and the improvement of the water-supply of the metropolis. In 1848, on the outbreak of cholera, he rendered important aid by the information which he afforded on its prevention by care in sanitary arrangements, as well as on the properties of disinfectants, and the best modes of applying them.

His knowledge of the relative value of different building stones caused him to be often consulted by architects and surveyors, who were guided by his opinion, and this not only in London, but in the provinces. At Weymouth, for example, when the new breakwater was about to be constructed, the old one having suffered much damage by the *Pholas* boring into the limestone, Dr. Buckland recommended that Portland stone should be used, for the *Pholas*, he said, would not bore into it so readily, on account of the amount of *silica*, or flinty matter, which it contained. Thus did he practically turn to account the teachings of science.

The reference to stone reminds us of the many stories which have been circulated respecting the discovery of living toads in cavities of solid rock, in which, it is alleged, they must have been entombed for ages. Dr. Buckland made a number of experiments

to test the truth of these stories, and we may give the result in his own words:—

“Twelve circular cells were prepared in a block of sandstone, to each of which a plate-glass was fitted. Toads were then placed in these cells and buried beneath three feet of earth, where they were left for over a year. Every toad shut up in sandstone died; but the greater number of those in the porous limestone were still alive, though greatly emaciated; these were again shut up, and by the end of the second year every toad had died. I also enclosed four toads in holes cut in the trunk of an apple-tree, and closed the holes with a plug of wood; all these toads were found dead at the end of a year. It seems from these experiments to follow that toads cannot live a year totally excluded from atmospheric air, or two years entirely excluded from food. Admitting that toads are found in cavities of stone and wood, we may account for it by supposing that the toad seeks a cavity while in the tadpole state, and feeds on insects which, like itself, seek shelter within such cavities. It then becomes too large to leave the hole; but there is always some small crack by which air and food can come in to support life. This tiny aperture is very likely to be overlooked by workmen, who are the only people whose work on stone or wood leads them to disclose cavities in these substances. No examination is made until the toad is discovered by breaking the mass in which it was contained, and then it is too late to ascertain, without carefully replacing every fragment (and in no case that I have seen reported has this been done), whether or not there was any crevice or hole by which the animal may have entered the cavity.”

These experiments are not the only ones placed on record by the biographer. We must not forget the original steps which were taken by Dr. Buckland, in his attempt to discover the species of wild animal by which the prehistoric cattle of Yorkshire were killed and their remains dragged into the great cave at Kirkdale.* They might have been Bears, or Wolves, or Hyænas. The professor of geology thought the evidence pointed to Hyænas, and he set to work to prove his theory in a most ingenious way.

In the Kirkdale cave he had found a portion of a skull which he believed to be that of a young Hyæna, but not having an undoubted skull of this species with which to compare it, he applied to Dr. Burchell, the African traveller (after whom the so-called

*The bone cave of Kirkdale was discovered in 1821, in the Vale of Pickering, about twenty-five miles from York, and was the first fossil cave known in England.

“Burchell's Zebra” was named out of compliment), to procure for him a living animal; and after some difficulty and delay, this was done. The beast was sent to England, and was kept first at Exeter Change, and subsequently at the Surrey Zoological Gardens. On offering him bones of oxen, similar to those found at Kirkdale but taken from recently-killed animals, Dr. Buckland found that they were gnawed and cracked by him precisely in the same way. He cracked the marrow-bones, and refused the bones which contained no marrow, exactly as did his ancestors ages before him in the wilds of Yorkshire. So wonderfully alike were these bones in their fracture that, judging from this point alone, it was impossible to say which bone had been cracked by the living Hyæna and which by the aboriginal of Kirkdale.

This Hyæna would have been killed in the cause of Science for the purpose of examining his skull, but the skull of a young Hyæna having been procured from another source, it was found on comparison that Dr. Buckland's views were correct.

Another ingenious experiment was that which he made with a view to determine the species of an unknown animal whose *foot-prints only* were visible on a slab of sandstone which had been sent to him from Scotland for examination. After some reflection, it occurred to him that these footprints resembled in some respects the impressions which might be made by the feet of a Tortoise. Acting at once on the impulse of the moment, he called his wife to come down and make some paste, while he went out to search for and bring in a living Tortoise from the garden. On his return he found the kitchen table covered with paste, upon which the Tortoise was placed, when to his great delight he found his suspicions confirmed. In its attempts to escape, the animal made tracks which were comparable to those which were imbedded by some remote ancestor on the block of sandstone.

Facts like these, expounded in his own peculiar manner, always earnest and enthusiastic, carried conviction with them, and made his lectures extremely popular. His auditors caught his enthusiasm, and the study of geology became the fashion.

The popularity of the British Association for the Advancement of Science, of which after its formal inauguration at Oxford he was elected President, is said to have been due in a great measure to his untiring industry and the spirit which he infused into the undertaking. As observed by Prof. Boyd

Dawkins, who has written a Preface to the volume before us, whatever estimate may be formed of his life and works, it cannot be denied that he was one of the makers of modern Oxford, and one of the founders of geology. Further on (pp 55-56), writing of the traditions of his teaching which he found on going up to Oxford in 1857, and on the value and influence of his works, particularly his 'Bridgewater Treatise,' and his 'Reliquiæ Diluvianæ,' he observes:—"In my own person, therefore, I can speak of the great influence which Dr. Buckland's work has had on me. I shall never cease to venerate his name. His books still, in my opinion, belong to the classics of geology, although, of course, during the last seventy years, the theories as to the Deluge, and the doctrine of Final Causes, have changed. The facts, however, have not changed; and for the Reptiles, the Stonesfield Mammalia, and the Pentacrinoids, I still use as a class-book the last edition of the 'Bridgewater Treatise,' edited by Prof. Phillips."

With this authoritative expression of opinion we may close a volume which no young naturalist of the present day should neglect to read. It is not only very entertaining, but also highly instructive, reminding us, more forcibly than any book which we have read for some time past, of the well-known lines of Longfellow:—

"Lives of great men all remind us
 We can make our lives sublime;
 And, departing, leave behind us
 Footprints on the sands of time;
 Footprints, that perhaps another,
 Sailing o'er life's solemn main,
 A forlorn and shipwreck'd brother,
 Seeing, shall take heart again."

The allusion in these lines to the "footprints" makes them singularly applicable to the subject of this memoir.

Allen's Naturalists' Library. Edited by R. B. SHARPE. *A Handbook to the Marsupialia and Monotremata.* By RICHARD LYDEKKER. Crown 8vo, pp. i.—xvi; 1—302. With 38 coloured plates. London: W. H. Allen & Co. 1894.

IN a well-written Introduction to this volume, Mr. Lydekker points out the chief features which characterize the Marsupial

or pouched animals and distinguish them from the higher orders of the placental mammals; laying particular stress, of course, upon the absence of a placenta; upon the form and function of the pouch as a receptacle for the young; upon the imperfectly developed condition of the young at birth; upon the peculiar modification of the breathing organs to prevent the danger of choking by the forced injection of milk from the teat to which it adheres; and upon the relatively small size of the brain in proportion to that of the head and body, with comparatively few convolutions, indicating a low order of intelligence in these animals. The marked peculiarity in regard to the succession of the teeth is also referred to as characteristic of the Order.

The Marsupials have adapted themselves to almost all modes of life; some, like the Thylacine (or so-called "Tasmanian Wolf") running in the ordinary manner; some, like the Kangaroos, progressing on the ground by long leaps; others, like the tree Kangaroos, arboreal; others, again, like Phalangers, volant, after the manner of Flying Squirrels; while a single species (*Notoryctes*) pursues a subterranean, Mole-like mode of life. It is remarkable that, so far as is known at present, there is no Australian Marsupial which is aquatic in its habits. The reason for this, no doubt, is the fact that such a habit in a pouched animal would be fatal to its existence, for unless it periodically resided altogether on land, the young in the pouch would be drowned by its immersion. The present state of development in the Australian Marsupials, according to Mr. Lydekker, is nothing to what it was during the Pleistocene or latest geological epoch, for we find at that period evidence of the existence of giant Kangaroos and Wombats (to say nothing of extinct forms which have no living representatives), by the side of which the largest existing species would appear almost dwarfs! The cause of this universal extinction of the most gigantic mammals throughout the world soon after man had made his appearance, is one of those problems which have not yet received a satisfactory answer, for, as Mr. Lydekker remarks, not even a glacial period could have made a clean sweep of the whole globe.

In regard to the present distribution of the Marsupials we are disappointed at the paucity of information given in this volume. We have searched in vain for statistics on several

points upon which a few details would be interesting to the uninformed reader. To begin with, we are not told what constitutes the difference between a Kangaroo and a Wallaby, nor what is the derivation and meaning of the latter name. Presumably, like the former, it is of native origin; but if there are any tangible characters by which a Wallaby may be always distinguished from a Kangaroo, it might have been well to point them out. A table of classification would have been a useful addendum to the Introduction. Then we should like to know what is the number of species of *Macropodidæ* at present known to exist, and how many of them have been made known and described since the publication of that epoch-making work, Gould's 'Mammals of Australia,' which was completed in 1863. Their respective distribution in Australia and New Guinea is another point upon which some information would be acceptable, as well as on the question whether there is any species common to the two countries. Probably not; though there may be some which are very closely allied. Again, looking to the physical aspect of Australia, and to the existence of great central deserts—which seem (in the case of man at all events) to create an almost insuperable barrier to overland communication, say between East and West, or between South and West—one would like to know whether any of the *Macropodidæ* find their way across Central Australia, or what are the limits of distribution so far as has been ascertained.

In regard to the habits and mode of life of the Australian and New Guinea mammals there is a woful lack of information; and it is little less than a reproach to those who write about them, that they have not collected more facts from colonists who, dwelling amongst or within measurable distance of these, to us, unfamiliar creatures, could tell us, if they would, a great deal more than we now know about them. We already hear of the threatened extinction of certain species whose skins are exported by the thousand to the London market; and it would seem as if some of them were to pass away, leaving us with little more knowledge concerning them than we possess in regard to forms already extinct. This surely ought not to be. The members of such scientific societies as have been long formed in Australia and Tasmania, and more particularly the staff of the Australian Museum, Sydney, should find opportunities for supplying this

needed information. Indeed, unless we are much mistaken, they have long been engaged in that direction, yet we do not find any quotation of the results, or extracts from their published 'Proceedings' or 'Transactions.' Even in the case of an animal like *Ornithorhynchus*, on which so much has been written during the past ten years, the reader is expected to be satisfied with a reprint of the observations made by Dr. George Bennett, so long ago as 1829-32, while the later researches of Ray Lankester, Flower, P. H. Macgillivray, Turner, Caldwell, Poulton, Pritchard, Stewart, Gill, Cope, Thomas, and others, are altogether passed over in silence.

A few pages of bibliography would have formed a most useful appendix to the volume, and, indeed, in a work supposed to be "up to date," should have been supplied. Mr. Lydekker has contented himself too much with classification, synonymy, and technical descriptions, while the coloured figures which are given are those of species which (with few exceptions) were known forty years ago, when these old plates were first published. It would have been far more satisfactory to have given new plates of species which have come to light since Gould's time. To be progressive, what we need is good figures of new species, or better figures of old ones than at present exist. Both, indeed, would be desirable, if publishers were only more enterprising, and authors more firm in their advice.

In the preparation of the letterpress Mr. Lydekker's labours have no doubt been lightened by his adoption of the classification and nomenclature given by Mr. Oldfield Thomas, in his excellent 'Catalogue of the Marsupials in the Collection of the British Museum,' published in 1888; but he has brought his work up to date by including in their proper places the species which have since then been described. Amongst these, perhaps the most noticeable is the curious Mole-like Marsupial *Notoryctes typhlops*, which was originally described by Dr. Stirling, in the 'Transactions of the Royal Society of South Australia in 1891.' As Dr. Stirling's account of its habits has been already printed in 'The Zoologist' (1891, p. 393), it will be unnecessary to repeat what is there stated, though we may observe that Mr. Lydekker gives some additional details of interest which have recently come to light. The coloured plate which he gives of this animal is a useful addition, although it has been unfortunately misplaced,

having been inserted amongst the *Echidnas*, opposite page 240, instead of where it should be, opposite page 188. This is not the only instance in which we have noticed the faulty arrangement of the plates. At page 240 we should find the plate of *Echidna*, but this, for no apparent reason, is relegated to page 280; the *Wombat* faces page 160 instead of page 124; the *Kola* should face page 78 instead of page 88; and the *Thylacine* should figure amongst the *Dasyurinae* at page 150, instead of being inserted amongst the *Opossums* at page 200. These, and other cases which might be mentioned, are, to say the least of it, embarrassing to the reader, though they may be remedied, of course, by re-arrangement in subsequent issues, or by re-binding.

Allen's Naturalists' Library. Edited by R. BOWDLER SHARPE.
Butterflies: by W. F. KIRBY. Vol. I., crown 8vo, pp. i-lxxiv,
 1-262, with 37 plates. London: W. H. Allen & Co. 1894.

IN treating of a subject so large as the present, the author is naturally under considerable difficulty in compressing his matter into two volumes of this size, and at the same time doing justice to the many species of which he writes. He has therefore taken in their order each subfamily, with its genera, and described the type butterfly only of each genus, omitting the various species; this reduces the work to reasonable proportions. In some instances, for special reasons, he describes more than one species; and in the case of British species describes all, in order, to use his own words, "to make the British butterflies illustrate and lead up to a study of the butterflies of the world." With each species he gives a copious synonymy.

In an Introduction of 74 pages the external structure and characters of the eggs, larvæ, pupæ, and perfect insects are described, with many interesting details, special attention being paid to neuration. The author adopts Scater's scheme of geographical distribution, and in connection with this makes the following interesting statement:—

"It is a mistake to suppose that the Tropics are always rich in butterflies, or that all tropical butterflies are beautiful. In proportion to the productiveness of a country in a state of nature, is often its unproductiveness when cleared and cultivated. Not only are thousands of

tropical butterflies as small and dull-coloured as the most inconspicuous of our own, but the Indian representatives of European or Japanese species are often much inferior to the latter in both size and beauty."

Mr. Kirby makes a special feature in this book of Classification: he discusses and compares in detail the various methods and systems, giving his reasons for his own particular view in each instance. It makes one wish for the day when one permanent nomenclature shall be universally adopted.

One cannot help a feeling of regret that a more detailed description of the habits of the insects is impossible, owing to want of space; but the author has succeeded in getting a considerable amount of information into the book. A noteworthy feature of the work is that the author gives the origin of names and terms when of any interest; thus the *Glanville Fritillary* is said to have been named after Lady Glanville of Glanvilles Wootton, in Dorsetshire, where the insect was first taken.

The Plates, which are copious, are also a feature of the book, and as a whole answer their purpose, and are fairly true to nature. Some are not up to the standard of the majority—*i. e.* Plates XXXIII. and XXXIV. are not to be compared with that of *Apatura iris*, which is excellent. The numbering of Plate I. is obviously not in keeping with the text. All the English species so far treated of, including the *Nymphalinae* (*Argynnis*, *Vanessa*, *Melitæa*, &c.), *Apatura*, and *Satyrinae*, are figured, and in addition to the types of genera there are a few plates of recently described and hitherto unfigured foreign butterflies. We cannot help regretting that room is not found for a plate of that important and extremely interesting butterfly *Araschnia levana* in its various stages, which surely deserves a place.

Many woodcuts of varieties, under-sides, pupæ, &c., are also given.

We cannot take leave of this book without expressing our admiration of the clear and concise method of arrangement throughout. The book is printed in an attractive style, and should find many readers both amongst beginners and also amongst more advanced students of Entomology.

THE ZOOLOGIST

No. 218.—February, 1895.

DISTRIBUTION OF THE MUSK-OX IN GREENLAND.

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

THE writer of the article on the Musk-ox in the volumes of the 'Badminton Library,'* devoted to "Big Game Shooting," remarks:—"The present range of the Musk-ox is limited to the North American continent and the outlying islands in the Arctic Ocean; it is perhaps best defined as lying to the north and east of a line drawn from the mouth of the Mackenzie River to Fort Churchill on Hudson Bay. Latitude 60° is generally accepted as its southern boundary, whilst the Musk-ox seems capable of existing very far north, as some are recorded to have been killed on Grinnell Land, latitude $82^{\circ} 27'$, within a mile of the winter quarters of H.M.S. 'Alert' in July, 1876, but I can find no record of any having been seen in Greenland."

Mr. Warburton Pike, the writer of the above citation, is a hardy sportsman and intrepid traveller, and in his book on the 'Barren Ground of Northern Canada'† gives most interesting information in regard to the habits of the Musk-ox, and its chase and capture by the Indians and half-breeds of Canada. In that debatable portion of the Hudson Bay Territory beyond the Great Slave Lake, which marks the limits of the hunting excursions of the Indians and the southern range of the Eskimo of the Arctic coast-line, the Musk-ox seems to be abundant, and Mr. Warburton

* 'Badminton Library: Big Game Shooting,' vol. i. (1894), pp. 428—435.

† 'Barren Ground of Northern Canada.' London, 1892.

Pike mentions a herd of at least a hundred being seen together, more than half of which were slaughtered by his Indian companions. It is singular that one whose experience in pursuit of the Musk-ox in Canada is unrivalled amongst white men, and who has written so well about the animal, should have been unaware that its range extends along two-thirds of the coast-line of the island continent of Greenland.

So long ago as 1780, Fabricius made mention of the Musk-ox in his 'Fauna Grœnlandica,' under the name of *Bos grunniens*, Linn., having found on an ice-floe, presumably on the shores of the Danish settlements, the skull and horns of a bovine animal, with its feet, and some of its long black hair, underlaid with wool. He was satisfied that no such animal then inhabited that part of West Greenland known to the Danes, and though he suggests that it might have come from the distant and then unknown east coast of Greenland, he seemed to consider it more probable that it had drifted on an ice-raft from Northern Asia. This reasoning induced him to misapply the specific name of the Asiatic Yak to this specimen—a mistake which he himself subsequently acknowledged (Bid. Selsk. Skr. 3 N., vi). No doubt the remains of the Musk-ox found by Fabricius had drifted from the east coast of Greenland, where it is now known the animal abounds. It is interesting, however, to note, that more than a hundred years ago, the Greenlanders or Eskimos of the Danish settlements on the west coast had no knowledge nor tradition connected with the Musk-ox; for otherwise Fabricius would not have selected the far-off regions of Asia as the probable, original home of his specimen.

Nearly twenty years ago I discussed in the pages of this journal* the known range of the Musk-ox, including its distribution in Greenland, and I see no reason to recede from the opinions which I then expressed, that the advent of the animal on the shores of Greenland had been from the westward, and that the progenitors of the Musk-oxen now living on the east coast rounded the north of Greenland, and spread southward until they met with some physical obstruction, such as the glaciers around Cape Farewell, which barred their further progress. The same, in all probability, has been the case on the

* Zool. 1877, pp. 355 *et seq.*

western coast of Greenland, where the great glaciers that debouch into Melville Bay, seem to have set a limit to their southern wanderings on that side. In the above-quoted article I referred to all the information then available regarding the distribution of the Musk-ox in Greenland, but since then considerable additions to our knowledge of the subject have been made. In the year 1892, Lieutenant Peary made his marvellous journey with the Norwegian, Astrup, from their winter quarters in Murchison Sound, on the west side of Greenland, across the inland ice, to what may prove to be the north-eastern point of Greenland proper. It was on July 4th, 1892, that Peary and Astrup reached the limit of their adventurous journey, and, in honour of the day, Peary gave the name of Independence Bay to the spot. He tells us that the day was delightfully warm and calm. The position of Observation Point on Navy Cliff, overlooking Independence Bay, was fixed as $81^{\circ} 37'$ N. lat., and $34^{\circ} 5'$ W. long. They found flowers of various kinds blooming in abundance, conspicuous among them being the ever-present Arctic poppy. Snow Buntings, two or three Sandpipers, a single Gerfalcon, and a pair of Ravens were observed. Two Humblebees, several butterflies, and innumerable flies were also noted. As for Musk-oxen, their traces were to be found on every mountain and in every valley; without making any particular search they saw twenty and killed two, but all of them might have been obtained without the least difficulty.

The position thus determined by Peary on the north-east coast of Greenland is about two hundred and seventy geographical miles north of the extreme point attained by the German Expedition of 1869-70, under Koldewey. There is no reason to suppose that there is any interruption in the range of the Musk-ox along the east coast line between these two points. Lieutenant Ryder, of the Danish Royal Navy, in his exploration of East Greenland in 1891-92, met with Musk-oxen in Jameson's Land, thus establishing the range of this animal on the east coast of Greenland to midway between the parallels of 70° and 71° N.

The distribution of the Musk-ox along the shores of Greenland covers an immense coast-line; we have traced it from Polaris Bay, on the north-west side of Greenland, from about 81° N., to Independence Bay on the north-east coast in about the

same latitude, and from there as far south as the seventieth parallel. On the east coast of Greenland the range of the Musk-ox in a line drawn over the map from north to south embraces at least seven hundred geographical miles.

THE BEAVER IN NORWAY.*

By A. J. OLSEN, Inspector of Schools.

ON July 14th, 1892, I looked into the laboratory of the Museum to take leave of the taxidermist and to give him some instructions, as I was about to start on a mountain excursion. Lying on his table was an entire Beaver, very big and exceedingly fat. In reply to my question where it came from he handed me a telegram from the bailiff Kolbenstvedt, to the effect that the animal in question had been confiscated by him as having been killed in Suldal during the close-season. As luck would have it, my journey lay through Suldal, and would thus afford me an opportunity of determining whether the species could be included in the Fauna of the Stavanger Amt—as actually born and bred at Suldal in the circle of its family—or whether it only belonged to the category of those *rari nantes* from Telemarken that may have strayed across the mountains to Suldal. For I had not previously heard of the Beaver in this Amt.

The captain of a Suldal steamer, Mr. Kolbenstvedt, promised to collect for me all possible information on this point during my absence, and on my return he communicated to me the following:—

“In the beginning of this century there was a Beaver colony near the farm Sandvig, on the south side of the Suldal lake. The colony emigrated from here in the thirties, but was discovered later on the Förlands islands in the Suldal river. These flat islands, covered with abundant deciduous timber, and situated in the middle of the stream (which here, in point of breadth, compares favourably with the biggest rivers of the east country—*e. g.*, the Glommen), must have afforded an admirable retreat for

* Translated from the ‘Stavanger Museums Aars-beretning’ (Stavanger, 1893), and communicated by Mr. G. N. Douglass.

these retired and circumspect animals. Still they may not have subsisted here in any great numbers, as it was only complete ignorance of their existence which led to the present specimen being killed, in a ditch along the main road through Suldal, near the farm Kvalstad. But in this manner, having once ascertained their existence, one has been able to find undoubted traces of them, not only at Suldalslaagen, but at several other places in Suldal. Near a mountain cottage called Gaaringsmoen, Beaver-huts, in course of construction, have been discovered."

Besides these data furnished by Captain Kolbenstvedt, I am informed by the merchant K. Bertelsen that during a shooting trip in the autumn (1892) he had observed, near the farm Naerheien in Suldal, and at a height of about 600–800 feet above the sea, a considerable number of trees which had, without doubt, been felled by Beavers. He had taken away some chips of wood that were, incontestably, the work of this the largest Norwegian rodent. He found no Beaver dwellings, but some cut-off stocks of wood had been brought (by Beavers) to the bank of a little river and there arranged in order, so that this might be supposed to be the beginning of a hut. Along the bank he also saw a big hole which, he presumed, had been dug by them.

It is thus proved that the Beaver is an inhabitant of the Stavanger Amt, but whether it occurs in more localities than at Suldal is still an open question. Now that our sportsmen and anglers have had their attention drawn to this fact, this species may be discovered in other parts of Ryfylke, where the natural conditions seem adapted to its mode of life.

Inasmuch as the Beaver may only be shot during the months of August, September, and October, and since for killing it out of season there is a fine of 80 crowns, applicable to all who participate in this infraction—so that the three men who killed the specimen referred to had to pay 240 crowns between them—it is possible that this species may spread in the fjord districts of the government; but it is doubtful whether an animal, which was so exceedingly valuable in former times, will ever again be shot with profit. The Beaver is not so prolific as other rodents; added to this, neither the skin nor the *castoreum*—at one time so highly esteemed—is in such demand as formerly.

As every animal killed in contravention of the law belongs

to the proprietor of the soil, the Museum authorities have had the skin of the present specimen valued by a furrier, who estimated it at 15 crowns; the *castoreum*, submitted to an apothecary, was judged, according to its weight, to be worth about 14 crowns. The skin might have fetched a slightly higher price at another season of the year, but can hardly be worth more. We thus find that a full-grown Beaver cannot be valued at much more than about 30 crowns. Still this is such a large sum that one should advise the landowners to protect these animals, as one of the resources of their farms, and by means of which a fair revenue can be made in bad times.

The Beaver is not really a noxious animal, except where it lives in large numbers. Then it is that the trees suffer; but, as it is of sedentary habits, it will not be difficult to restrict it within reasonable limits.

NOTES ON THE ORNITHOLOGY OF NORTHAMPTONSHIRE AND NEIGHBOURHOOD.

BY THE RIGHT HON. LORD LILFORD, F.L.S.

I CONTINUE my notes from the end of 1893 (Zool. 1894, p. 221):—

JANUARY, 1894.

2nd. I received a Mealy Redpoll, "in the flesh," from Mr. W. Tomalin, of Northampton, who informed me that it had been taken by a birdcatcher near Roade a few days previously. Very few occurrences of this species in Northamptonshire have hitherto come to my knowledge.

6th. Mr. Walter Stopford informed me that he noticed nine Dabchicks diving in a small "wake" in the ice on our river near Islip—25 degrees of frost.

10th. A fine old male Pochard was brought to me, killed to-day near Tichmarsh Mill.

11th. Our schoolmaster reported to me that a pair of Green Woodpeckers had for some days been actively engaged in pulling out the reeds with which the school-house is thatched over.

13th. I was informed of the passage over Pilton, on 9th inst., of forty-two Wild Geese.

24th. I received from Mr. F. B. Simpson a stuffed specimen

of Grey Plover, *Squatarola helvetica*, with the information that it had been shot near Barrowden, in Rutland, about Dec. 6th ult. This is the first bird of this species, killed in our neighbourhood, that has come into my hands.

31st. A beautiful adult Kittiwake was picked up dying on the road near Aldwinckle, and brought to me dead.

FEBRUARY.

11th. Under this date the Rev. Henry H. Slater, of Thornhaugh (to whom I am indebted for many interesting notes), writes, "Rook carrying stick to the rookery." For brevity's sake, I shall refer for the future to Mr. Slater's communications with the initials H. H. S.

14th. A great many Hawfinches about the pleasure-grounds at Lilford.

15th. A large flock of small Gulls observed near Thorpe Waterville by W. Edwards.

18th. Stock Doves paired. Green Woodpeckers still busy at thatch of school-house, Lilford (see Jan. 11).

19th. "A curious season: some Partridges were paired before 1st inst.; most are now, but some coveys show no signs yet. A lot of nineteen together."—H. H. S.

22nd. A small string of Wigeon on our decoy; one of them taken to-day, and sixteen yesterday, with eleven Mallard and three Teal, in the two "drives."

28. My two tame Ravens busy at making a nest in a large beech-tree close to the house. These birds, of which the male is Dutch and the female from Andalusia, have each one wing cut, not pinioned, but are otherwise in complete liberty.

MARCH.

1st. My falconer tells me that some Long-eared Owls (of which species I have turned out several during the last few years) have taken up their quarters in a plantation near his house, and are to be heard thereabouts every night.

3rd. "Rooks lining their nests with moss and grass; a pair *in coitu*, but some only beginning to think of repairing their nests."—H. H. S.

11th. Pied Wagtails re-appearing about Lilford in force. "Pied Wagtails back, and inspecting their last year's nest at Thornhaugh."—H. H. S.

12th. Two Canada Geese seen near Wadenhoe by my son. These birds are wanderers from Mr. H. S. O'Brien's lake at Blatherwyche; a few visit us annually, but this is the first report of them that has reached me for this year. Mr. John Crisp informs me of an unusual number of Wigeon on our river near Elton.

14th. Twenty-five Wigeon on our decoy-pool.

17th. "Green Sandpiper on Lowick brook."—H. H. S. This is rather an unusual time, in my experience, for the appearance of this erratic species in our neighbourhood, although I have records of its occurrence therein for every month of the year.

18th. The decoy-man reports six Swans, apparently Whoopers, near the decoy.

19th. "At dusk a Woodcock flew near me in the Bedford Purlieus, uttering the curious half-grunt, half-squeak, that they use only during the breeding season. Rooks have eggs. Saw a Cuckoo. Viper out basking."—H. H. S. A Stock Dove sitting on two eggs near the house at Lilford.

21st. The falconer assures me that he has known of Song Thrushes' nests with eggs for more than a fortnight past. I received a letter from Mr. G. Charlton, informing me that on the 18th inst. he observed hundreds of Starlings hawking for insects, as is their common habit in summer, near Boughton, Kettering. Tawny Owl sits with three eggs near Lilford.

24th. First eggs of Peewit brought in.

25th. Under this date Mr. Thos. W. Fitzwilliam informed me that several pairs of Rooks were nesting in the Heronry at Milton.

29th. A Green Sandpiper was taken at the decoy and brought to me alive. This bird is still alive and thriving in our aviary (Jan. 7th, 1895). The falconer tells me that he noticed three Pied Woodpeckers this morning on the same tree—no doubt love-making; this species, though not very rare, can hardly be considered as common in our immediate neighbourhood.

APRIL.

2nd. The falconer, who climbed to the Raven's nest to-day (see Feb. 28th), told me that it contained three eggs, and that both parent birds attacked him savagely. This nest is situated at about 18 ft. from the ground, and although it can be

seen from several windows on the western side of the house, is so artfully placed between thick branches at their junction with the main trunk that it is impossible to see what it contains without climbing.

3rd. The Rev. S. Baker, of Hargrave, informs me that a white Hedgesparrow is constantly frequenting that neighbourhood.

4th. "Fieldfares still about this morning. I think that I saw them start northwards. They were feeding about in a grass field at 10 a.m., and all (about fifty) shortly mustered on an oak-tree in the middle of the field. In a quarter of an hour or so, after chattering a good deal, they set off in a compact body, rising high in the air, towards N.W."—H. H. S.

21st. A nest of the Little Owl in stump of elm in the deer-park at Lilford contained four eggs.

27th. "Grasshopper Warblers in full song in Bedford Purlieus. I timed one to-day—twenty-one continuous minutes with only the minute momentary breaks when breath was hastily taken."—H. H. S.

28th. A Kestrel's egg found in Stock Dove's nest in hollow elm in the deer-park at Lilford, with one egg of rightful possessor.

30th. The tame Ravens have now four young and an egg unhatched in their nest.

MAY.

2nd. Mr. G. Nevile reported that he had seen a Redshank two or three days ago near Aldwinckle.

4th. One of our keepers found another nest of the Little Owl containing six eggs in the deer-park at Lilford.

19th. I received a nest and two eggs of Grasshopper Warbler from the Rev. H. H. Slater, who wrote as follows, under date of 17th inst.:—"I found a nest of Grasshopper Warbler to-day near Twywell, with six eggs. We had to cut more than a square yard of grass down with a pocket-knife before we could find the nest. These were the most handsomely marked eggs of this bird that I ever saw, and this is, so far as I remember, the ninth nest that I have found. The nest was situated on the side of a grassy bank (the grass two feet high), interspersed with small thorn and other bushes, by the side of Twywell Brook."—H. H. S. I have stated these details at length as although, from many reports sent to me, it is evident that the Grasshopper Warbler has of late years become a regular and not uncommon summer

visitor to our county, it is not, and never was, common in the immediate neighbourhood of Lilford, and the nest and eggs here referred to are the only Northamptonshire specimens that I have seen.

20th. Seven degrees of frost. The falconer reports a female Peregrine seen this morning close to the house at Lilford.

23rd. Hundreds of House Martins flocking about the lee-sides of the house at Lilford seeking protection from the bitter N.E. wind.

25th. I watched a pair of Coal Tits feeding their young in the wall of a sunk fence close to the house for several minutes: the only food that was brought to the brood during my observation consisted of small green larvæ, all taken from a neighbouring beech-tree. Our Cuckoos, which were apparently in about their average numbers at Lilford, and very clamorous till about the 11th inst., have become entirely silent, possibly absent, since the present spell of wintry weather commenced.

JUNE.

3rd. We found a nest of Spotted Flycatcher in the flower-garden, with eggs, in a somewhat unusual situation—the centre of a thick bush of variegated holly at about four feet from the ground.

9th. I noticed more Swifts at Lilford than I ever remember to have seen there before, except at the end of July. I must mention that many summers pass without my observing more than three or four of this species near our house till the period of southward migration. On this day I must have seen fifty or more over the river. The House Martins are still swarming about the house (where they never build), although the wind has veered to S.E., and the weather is warm.

19th. Some fifty House Martins, all old birds, still about the house at Lilford, though I cannot hear of a nest within a mile. Flycatchers are comparatively scarce with us this year.

21st. A pinioned Gadwall brought off a brood of eight young at our park-pond.

24th. One of our gamekeepers assured me that he had seen a Kestrel stoop at and knock over a young rabbit that managed to escape by struggling into a thick fence. The same keeper tells me that there are more Nightjars about our woods than he ever saw there during the last twenty-five years.

JULY.

11th. I was assured by a lady who lives at Stoke Doyle that there is a brood of Little Owls in an old wall in that village.

20th. My son reports swarms of Starlings devouring the "fly" on pea-fields near Achurch.

26th. To-day, and for several days past, I have remarked that Woodpeckers of our three species have been unusually clamorous in the elm-trees close to the house. Sultry heat after heavy rain.

27th. The falconer, who went to search for young Hobbies in their favourite wood, only saw one old bird of this species, and could not discover a nest.

29th. Many young Swallows and House Martins about the house; of the latter species I had hardly seen one here since June 20th ult.

30th. Little Owls very noisy close to the house between 8 and 9 p.m.

AUGUST.

2nd. A pair of Swallows have a nest, full of young birds, under a rustic bridge near our boat-house, about three feet above the water.

6th. An immature Shag was brought to me alive, taken at Stanground, Peterborough, on 3rd inst.

13th. Two Curlews going westward over Wigsthorpe Wolds; first report of season. Mr. Walter Stopford tells of a few Swifts still lingering at Tichmarsh.

16th. First report for the season of Whimbrel; a solitary bird seen at Little Houghton, Northampton.

17th. I noticed a very large gathering of Swallows, chiefly young birds, on the willows by the river, just below Lilford.

20th. I had two very near views of a young male Goldeneye from my boat on the river, about half a mile below Lilford. This is a remarkably early date for the appearance of this species in our neighbourhood.

21st. Total disappearance of all Hirundines from Lilford.

26th. Green Sandpiper at park-pond; first of this autumn. Green Woodpecker very busy after ants in the interstices of our garden-balustrades.

27th. Teal on the decoy; first report of this season. First report of Snipe for this season.

SEPTEMBER.

1st. A young female Montagu's Harrier, found alive, but desperately wounded, in a field of barley near Thorpe Waterville, and brought to me. Upon enquiry, I found that this bird, that had been haunting the neighbourhood, and was reported to me under various designations, during the last fortnight, was shot by a lout in standing barley on 31st ult. ; he did not take the trouble to look for it, but it was found this morning by a man at work with a mowing-machine, who picked it up, dashed it against the machine, and threw it away. This man told his employer, who found the unhappy bird still alive, put it out of its misery, collected a good many of its scattered feathers, and sent the bird with them to me. This is the first Northamptonshire specimen of this Harrier that I have ever heard of. With reference to the reports to which I have above referred, I may mention that I had been told of a Kite, an Osprey, and a Buzzard, as seen at various times, and by various people, in the neighbourhood of Thorpe, Aldwincle, and Wadenhoe ; and I have not the slightest doubt that all these reports were founded upon the appearance of this Harrier.

2nd. Mr. W. Edwards told me of having on several recent occasions noticed a Greenfinch near Thorpe, with many white feathers in wing and tail.

3rd. I observed some half-dozen Herring Gulls circling about high in air, and very clamorous, over Lilford.

6th. My son shot a young female Sparrowhawk that dashed at one of his dummy Wood Pigeons on a pea-field near Aldwincle.

10th. First Wigeon of the season, taken on the decoy. First report of Grey Wagtail at Wadenhoe Locks. Tern, in all probability *S. fluviatilis*, reported by the decoy-man and others as seen about the river about a mile below Thrapston.

11th. Whilst following the Bucks Otter Hounds this morning, I noticed that a young Coot, flushed by the hounds from a river-side-spinney near Tichmarsh, was furiously mobbed and pursued by many House and Sand Martins, who kept stooping at it after it settled on the river, at perhaps 100 yards from the spot whence it was first started.

15th and 16th. I received reports from one of the game-

keepers, and from my daughter-in-law, of a very large raptorial bird seen near Aldwinckle. The former informant stated that it was "many sizes larger than the Kite," *lege* Harrier; and the latter, that it seemed to be fully as large in spread of wings as a Heron. 16th. Four Wigeon on the decoy.

19th. First report of Redwings; four seen on Pilton.

21st. I noticed a few Reed Warblers still lingering amongst the osiers just below Lilford.

24th. Mr. W. Tomalin reported a bird, that can hardly have been other than Great Crested Grebe, as observed on the river between Lilford and Oundle.

26th. First report for the season of Golden Plover, seen by my son near Aldwinckle.

30th. The only Corncrake killed on our shootings this year was shot to-day on Achurch.

OCTOBER.

1st. First Jack Snipe of season, killed in a piece of seed-clover on Aldwinckle. "Small flock of Fieldfares (first report) on Sutton Heath."—H. H. S.

3rd. First reports for the season of Merlin and Common Redpolls, at Lilford.

4th. First report of Bramblings near Lilford.

13th. First report of Siskins, between Achurch and Thorpe.

15th. One of our gamekeepers, a Highlander from Inverness-shire, assured me that he this morning saw a large dark-coloured Eagle fly over within 100 yards of him near Sudborough. Woodcocks (first reports of season) from Burghley and Glapthorn.

18th. A Little Auk, picked up yesterday at Luddington, was brought to me alive, but dying. Another specimen of this species was picked up near Stamford within a day or two of this date.

19th. An Eagle was seen flying over Oundle Wood by two gamekeepers, and reported to me by the Rev. Ed. Moore, of Benefield Rectory.

22nd. A small flock of Wild Geese seen by my son on Achurch.

27th. I received a stuffed specimen of Crossbill, in the green plumage, from Mr. G. Bazeley, of Northampton, who informed me that it was one of several that had been sent to him, killed out of a large flock that had been haunting Harlestone Firs for

some time past. My son told me of seeing a Short-eared Owl on Wigsthorpe Wolds to-day. My trained Goshawk, "Jessica," received from France as a nestling in the summer of 1893, and a really good rabbit-hawk, took her first hare to-day.

30th. Young Rooks crying loudly from a nest in tall elm-tree near Thorpe Station.

NOVEMBER.

5th. My son, who was shooting on Pilton to-day, tells me that they put a Little Owl and a Barn Owl together out of some old bushy stone-pits.

6th. Mr. G. Bazeley (*cf.* 27th ult., *supra*) tells me that Harlestone Firs have suddenly been invaded by large numbers of Jays, of which species hardly any had been seen there for several months. He adds that the Crossbills have entirely quitted that locality, and attributes their disappearance to the advent and persecution of the Jays. A beautiful old female Peregrine was shot whilst carrying off a Pigeon near Peakirk, and sent to me in the flesh by her destroyer, who informed me that he had been told that his victim was a "Humming Buzzard" (*sic*). He also told me that he had killed an Osprey during barley-harvest, in the same district, some years ago.

7th. Wood Pigeons coming in swarms to feed on the fallen beech-mast about Lilford.

9th. I received, from Mr. G. Bazeley, a stuffed specimen (immature) of Common Tern, killed at Ravensthorpe Reservoir on 31st ult., a very late date for this species in our county.

10th. The falconer tells me of having recently noticed a very unusual abundance of Kestrels and Sparrowhawks, and two Peregrines, close to the house at Lilford; and to-day a great passage of Peewits towards the south.

11th. I heard, from Mr. William Bazeley, of many Kittiwakes about the meadows near Northampton, and that he had received a Great Northern Diver for preservation that was killed at Ravensthorpe Reservoir on 6th inst. I may add that this bird, a female in immature plumage, was subsequently most courteously presented to me by Mr. John Ewnson, C.E., and is the first Northamptonshire specimen of which I have personal knowledge. Mr. W. Tomalin, however, informs me that a Great Northern Diver was killed at Kingsthorpe about 1855, by a

cousin of his, Mr. Richard Dunkley, after a severe storm in the month of November.

16th. The decoy-man reports a single Whimbrel near the decoy; he is well acquainted with the differences between this bird and the Curlew, and I have no reason to doubt his accuracy; but this is a most unusual time of year for the appearance of Whimbrel in this neighbourhood, although many travel up our valley in August and September, and we generally see a few during the return passage in May. A Common Guillemot was caught alive by a shepherd at Kislingbury, and taken alive by him to Mr. Chas. Watts, of Kislingbury House, who was good enough to make me a present of the bird, stuffed by Mr. G. Bazeley. This is the first Northamptonshire Guillemot that I have hitherto seen, or, to the best of my recollection, ever heard of.

18th. About thirty Golden Plovers feeding on the meadows near the decoy.

19th. Two Swans on the flood-water near Achurch.

23rd. A female Pintail dropped into the decoy with a bunch of Teal at morning flight time.

26th. Mr. G. Nevile assured me that there are three broods of young Rooks just out of their nests in high elms at Pilton.

DECEMBER.

3rd—31st. A good many Mallard, and a few other fowl, on the decoy; but they were all what the decoy-man calls "stiff," and would not work to the dog. Our total catch since the last week of November inclusive only amounted to sixty head, consisting of thirty-nine Mallard, fifteen Teal, one Gadwall, one Pochard, three Wigeon, and last, not least, a very beautiful hybrid male of Teal and Mallard. This is without doubt of the race originally described by Pennant under the name of "Bimaculated Duck," and subsequently wrongly identified as *Anas* and *Querquedula glocitans*, to which species it has a certain resemblance in colour; but this specimen is considerably larger than the latter bird, and is, in fact, well described and figured in 'Yarrell,' 2nd ed. vol. iii. p. 260, under the heading of "Bimaculated Duck, *A. glocitans*." I may mention that this is the first specimen of this hybrid that I ever saw. Amongst the "fowl" that appeared on our decoy during this month were several

Pochards and a male Shoveller. With regard to the only one of the former species taken, pinioned, and put upon our park-pond, it is perhaps worthy of mention that she was soon joined there by a wild male of her kind, who still remains (Jan. 16th, 1895) in her close vicinity.

I append reports of first appearances of spring and summer migrants in our county. In instances where no special locality is mentioned, Lilford is to be understood:—March 9th, Chiffchaff, Warmington; 14th, Woodcocks, Thornhaugh (H. H. S.); 19th, Cuckoo, Thornhaugh (H. H. S.); 22nd, Wheatear. April 3rd, Swallow, Barton Segrave; 4th, Sand Martin, Lowick; 5th, Wryneck, Blackcap, Barton Segrave; 7th, Willow Wren, Redstart; 9th, Tree Pipit, Grasshopper Warbler, Thornhaugh (H. H. S.); Nightingale; 12th, Sedge Warbler, Whinchat; 13th, Ray's Wagtail; 16th, House Martin; 18th, Whitethroat, Redshank; 21st, Garden Warbler; 28th, Lesser Whitethroat; 29th, Corncrake. May 1st, Reed Warbler; 5th, Swift, Hobby; 8th, Turtle Dove; 10th, Spotted Flycatcher; 11th, Common Sandpiper; 13th, Wood Warbler.

RARE BRITISH BIRDS IN THE HUMBER DISTRICT.

BY JOHN CORDEAUX.

IN 'The Zoologist' for 1891, pp. 361-367, I have given a list of some of the rarer birds which have occurred in the Humber District during the ten years preceding that date; since this there have been several occurrences of rare wanderers, the records of which are now collected and brought together for the first time.

RING OUZEL, *Turdus torquata* (L.), var. *alpestris* (C. L. Brehm).—On February 25th, 1893, Mr. Hewetson, of Leeds, and I saw two apparently adult males near the coastguard-station of Kilnsea; these, both on the ground and when in flight, showed much more white on the wings and flank than the ordinary and common type which occurs on the east coast of Yorkshire so regularly on migration in the autumn ('The Naturalist,' 1893, p. 105). Subsequently one was obtained in the same neighbourhood, which I saw; this was unquestionably referable to the

form distinguished as *Turdus alpestris* by C. L. Brehm, which inhabits the alpine regions of Central and Southern Europe. I am inclined to think this race, or rather species, as recently revised by Dr. Stejneger and Mr. Seebohm, occurs on migration more commonly on our east coast than we are aware of. [See the remarks by Mr. John Young on *Turdus alpestris* in Hungary further on (pp. 66, 67).—ED.]

BLACK-THROATED CHAT, *Saxicola stapazina*, Vieillot. — A russet-coloured Wheatear, with the sides of the head and throat black, apparently an adult male, was seen by Mr. Hewetson and his sons on Sept. 18th, 1892, near the chalk embankment of the Spurn. Mr. Hewetson wrote, "I was quite close to it for some time." If the sketch of the bird, which he obligingly sent me, is quite correct as to the extension of the black to the lower part of the throat, it is more probable that this was *S. melanoleuca* (Güld.), the eastern form of *S. stapazina* (Zool. 1892, p. 424; Nat. 1893, p. 7).

BLUETHROAT, *Cyanecula suecica* (L.). — On Sept. 20th, 1892, Mr. G. H. Caton Haigh saw an immature Bluethroat in a hedge at North Cotes. It came out on a twig within three feet of his face. Subsequently he shot it, but, being only winged, it succeeded in escaping in the dense covert. One was also seen and recognised at the Spurn on Sept. 22nd in the same year (Zool. 1892, p. 417; Nat. 1893, p. 9).

BARRED WARBLER, *Sylvia nisoria* (Bechstein). — Besides the one already recorded from Spurn in 1884, another, an immature bird, was shot by Mr. G. W. Jalland, of Hull, at Easington, in Holderness, close to the coast, on Oct. 19th, 1892. This is now in the Science and Art Museum, Edinburgh (Zool. 1892, p. 424; Nat. 1893, p. 14). A third, an immature male, was shot at Kilnsea by Mr. G. E. Clubley, on Nov. 13th, 1893, and is now in Mr. J. H. Gurney's collection (Nat. 1894, p. 15). In the autumn of 1894 Mr. Jalland saw a bird, presumably of this species, in a hedge close to the village of Easington, but failed to get it; and in the same season Mr. F. Boyes, of Beverley, wrote, in 'The Field' of Dec. 29th, that an immature Barred Warbler was shot near Skirlaugh by Mr. Darley, a birdstuffer in Hull, on Sept. 3rd. This makes five examples seen and four obtained in Holderness in ten years.

SIBERIAN WILLOW WREN, *Phylloscopus borealis*. — On Nov. 21st, 1894, after some very heavy gales from N. and N.E., when out walking on the headland, Mr. Bailey, of Flamborough, and I, saw, on the lee-side of a plantation near the old lighthouse, a Willow Wren with a very distinct wing-bar; we watched it for some minutes, and, with the occasional aid of a glass, at the distance of a few feet. Subsequently I was able to establish the identity of the bird, from notes taken at the time, with *P. borealis*, and also from skins in Mr. Dresser's collection (Nat. 1894, p. 40; Zool. 1894, p. 125, footnote). Is also recorded in Mr. Bailey's list of birds in 'Flamborough Village and Headland,' 1894, p. 156; but the year was 1893, not 1894, as printed in this excellent guide-book.

YELLOW-BROWED WARBLER, *Phylloscopus superciliosus* (J. F. Gmelin).—One was shot on Oct. 13th, 1892, from a hedge at North Cotes, by Mr. G. H. Caton Haigh, of Grainsby Hall. This is now in Mr. Haigh's collection (Zool. 1892, p. 413; Nat. 1893, p. 10). Mr. F. Boyes, of Beverley, recorded three shot by Mr. Swailes, the nurseryman at Beverley, from the gardens, on Oct. 8th and following days ('The Field,' Oct. 27th, 1894), and one of these was secured by Mr. W. Eagle Clarke for the Science and Art Museum, Edinburgh; see Zool. 1894, p. 459.

FIRE-CRESTED WREN, *Regulus ignicapillus* (C. L. Brehm).—One, a fine adult male, Easington, in Holderness, on Oct. 15th, 1892. Came in with an extraordinary immigration of Gold-crested Wrens at that date (Zool. 1892, p. 418; Nat. 1893, p. 11).

RED-BREASTED FLYCATCHER, *Muscicapa parva*, Bechstein.—This example, shot at Scarborough on Oct. 23rd, 1889, is, I am informed, not in the possession of Mr. J. H. Gurney of Keswick Hall, as stated by me (Zool. 1891, p. 362), but in the collection of Sir V. H. Harpur Crewe, Calke Abbey, Derbyshire.

GREENLAND REDPOLL, *Acanthis hornemanni*, Holböll; the *Linaria canescens* of Gould.—On Feb. 25th, 1892, Mr. Hewetson and I saw a most beautiful example, presumably of this large arctic Redpoll, clinging to the dead stalk of a thistle on Kilnsea Common. It was with Snow Buntings, remaining after these had flown, and fortunately allowed us a very close inspection (Nat. 1893, p. 104). In 1894 Mr. Hewetson obtained a Redpoll, shot in the winter of 1892, and which had been kept since that time by Mr. P. Loten, the birdstuffer at Easington, in

a closet in his room. This also is a most beautiful bird, and is probably referable to the *Linota exilipes* of Coues, which appears to differ from the Greenland bird only in its somewhat smaller size and proportions. It was sent by Mr. Hewetson to Lord Lilford, and I understand will shortly be figured in the 'Illustrations of British Birds.' Mr. Loten remembers that two others of the same sort were brought to him last winter, but were unfortunately eaten by a cat. *Fringilla linaria*, Linn., is a common visitor on migration in the Spurn district, the larger races of the northern Redpolls being also occasionally met with.

WHITE-THROATED BUNTING, *Zonotrichia albicollis*, Bonap.—One was shot on Feb. 13th, 1893, by Mr. G. W. Jalland, of Holderness House, in his garden. This bird, now in Mr. Jalland's collection, is an adult male in winter plumage (Zool. 1893, pp. 149–50; Nat. 1893, pp. 113–14). This very beautiful specimen of the American White-throated Sparrow or Bunting was preserved and set up by Mr. Philip Loten, of Easington.

LAPLAND BUNTING, *Calcarius lapponicus* (L.).—On May 11th, 1893, Mr. M. Bailey and I saw a fine adult male in summer plumage on Bempton Cliffs (Zool. 1893, p. 225; Nat. 1893, p. 203). In the winter of the same year very considerable flocks occurred at Flamborough and on the Lincolnshire coast (Zool. 1894, p. 19; Nat. 1894, p. 39).

SNOWY OWL, *Nyctea scandiaca* (L.).—One, fully adult, was seen in a field close to the coast at Easington, on Sept. 27th, 1891, by myself, Mr. Hewetson, and Mr. H. Marsh of Leeds, and others ('The Field,' Oct. 3rd, 1891; Nat. 1891, p. 359).

RUDDY SHELDRAKE, *Tadorna casarca* (L.).—A female bird of this species, now in Mr. G. H. Caton Haigh's collection, was shot on Humberstone fitties on Sept. 1st, 1892 (Zool. 1892, p. 334; Nat. 1893, p. 8). See also Zool. 1892, p. 392.

CRANE, *Grus communis*, Bechstein.—One, an immature bird, was shot on the South Cliff Farm, Flamborough, in February, 1892 (Nat. 1893, p. 203). [Since then an adult Crane in abraded plumage, but apparently a wild bird, was shot at Benacre, near Lowestoft, in June, 1893, as recorded by Lieut.-Col. Butler (Zool. 1893, p. 313).—ED.]

ON THE VARIATIONS OF THE VIPER (*VIPERA BERUS*)
IN DENMARK.

By G. A. BOULENGER, F.R.S.

MR. G. F. L. SARAUW, of Copenhagen, has most kindly furnished me with an extensive series of Vipers collected in various parts of Denmark, mostly during the past year. Owing to the interest attached to individual variations in this difficult group of Snakes, and to the importance of establishing the characters by which *Vipera berus* is to be distinguished from its nearest allies, *V. ursinii*, *V. renardi*, and *V. aspis*, it may be useful to record the results of my examination, and to compare the range of variation in this limited area with that ascertained in Great Britain, as reported in this Journal three years ago (1892, pp. 87—93).

The specimens sent me by Mr. Sarauw are from the following localities:—

1. Near Copenhagen, N. Seeland (1 spec.).
2. Knudskov, W. of Vordingbor, S. Seeland (18 specs.).
3. Skaarup, E. of Svendborg, S. Fyen (1 spec.).
4. Glamsbjerg, E. of Assens, S.W. Fyen (7 specs.).
5. Bönnelykke, Longelsi Sogn, Langeland (1 spec.).
6. Near Aalborg, N. Jutland (1 spec.).
7. Hogholt, E. of Hjörning, N. Jutland (1 spec.).
8. Near Viborg, C. Jutland (14 specs.).
9. Trust, near Rødkærsbro, C. Jutland (1 spec.).
10. Arsing, S.W. of Herving, C. Jutland (1 spec.).
11. Skarrild, S.W. of Herving, C. Jutland (2 specs.).

To these I am able to add four more, from Seeland, previously received from Prof. Lütken. My notes are therefore based on 52 specimens.

1. SHAPE OF SNOUT.—The snout is perfectly flat above in all specimens but one. In this (from Glamsbjerg, a ♀) the canthus rostralis is somewhat raised, the snout consequently concave above.

2. SCALING OF HEAD.—In 48 specimens the frontal and parietal shields are well developed; in 4 (Seeland, ♀, Knudskov, ♂ ♀, Viborg, ♂) the parietals are very small, or broken up into scales. The frontal is as long as broad, or a little (not more than one-

third) longer than broad, and usually a little shorter than its distance from the end of the snout, as long as or very slightly longer or shorter than the parietals. In one specimen (Viborg, ♂) the frontal is in contact on both sides with the supraocular, in two (Knudskov, ♂) on one side only; in all the others one series of small shields separates the frontal from the supraocular. The rostral is as broad as deep, or slightly (7 : 6 or 8 : 7) broader than deep, or slightly (9 : 8 to 6 : 5) deeper than broad; it is in contact above with two apical shields, except in 4 specimens (Knudskov, ♂, Glamsbjerg, ♂, Viborg, ♂ ♀), in which the apical is single. Two specimens (Viborg, ♀, Knudskov, ♂) have a single canthal on one side; all the others have two. A single series of scales separates the eye from the labials, except in one specimen (Knudskov, ♂), which has two complete series on the left side, whilst on the right side the two series are separated by a single scale between the eye and the fourth labial. The latter arrangement is also shown on both sides in one specimen (Skarrild, ♀), and on one side in two others (Knudskov, ♂, Glamsbjerg, ♀). 6 to 12 scales (exclusive of the supraocular) surround the eye, 8 or 9 being the usual number. The upper labials vary from 7 to 10, the two extreme numbers occurring but once; in 42 cases there are 9 labials, in 60 there are 8 (the number not being always the same on both sides of the animal); in 73 cases the fourth and fifth labials are below the eye, in 31 cases the fourth only.

SCALING OF BODY AND TAIL.—The scales on the body are in 21 rows, except in four specimens: one with 19 (Viborg, ♂), one with 20 (Knudskov, ♂), and two with 23 (Glamsbjerg, ♀, Trust, ♂). The ventral shields vary between 135 and 147 in ♂, 140 and 154 in ♀; the subcaudal shields between 34 and 42 in ♂, 28 and 38 in ♀.

SIZE.—The largest male specimen measures 590 millim., the largest female 650. The length of the tail is $6\frac{1}{2}$ to 8 times in the total in males, 8 to $9\frac{2}{5}$ times in females.

COLORATION.—The same amount of variation is shown as in the British specimens, on which I have previously reported, and the sexual differences are as a rule well marked, males being characterized by the intensity of their black markings; among the latter we likewise find silvery-grey, almost white, specimens, with pitch-black markings, the so-called white Vipers, on

which so much has been written in popular papers of late. The red specimens, of which there are also several in the collection, are females. Of special interest are a number (15) of black specimens, all from the island of Seeland, where they appear to be of common occurrence. Most of them are males, and I have satisfied myself that the melanism is usually obtained, in that sex, by the expansion of the black markings, as is proved beyond a doubt by some intermediate specimens, among which is one having the black of the back, formed by the expansion of the vertebral band, separated from that of the sides, formed by the coalescence of the lateral spots, by a narrow light brown undulous stripe. In females, on the other hand, as well as occasionally in males, the black is produced by gradual darkening of the ground colour; so that in most cases, under certain lights, the typical markings may still be detected. So far as we know at present, the former type of melanism is not found in Great Britain; all the specimens hitherto examined are of the latter type, and females.

These observations confirm those previously made by Geithe in Germany. Fatio had also observed among the *Vipera aspis* of Switzerland that some are black through darkening of the ground colour, and others through enlargement and confluence of the markings.

In all the black specimens at least a few dots of whitish are visible on the lips, and of yellow under the end of the tail. The belly is black or dark bluish grey, uniform or with small whitish or reddish spots; specimens about to cast their skin may have the ventrals almost white, with the outer ends blackish brown. With few exceptions the end of the tail is bright yellow or orange beneath.

ON THE PROPER SPECIFIC NAMES OF THE COMMON SHREWS OF ENGLAND AND THE CONTINENT.

BY OLDFIELD THOMAS, F.Z.S.

THE extraordinary laxity which prevails in the nomenclature of Mammals is nowhere better illustrated than in the cases of the Common, Pigmy, and White-toothed Shrews, all three of which have constantly been referred to by names which have over and over again been shown to be untenable, and the present note may

be looked upon in the light of an appeal to zoologists in general to use the names that are technically correct. For to go on using names which, however familiar, are known to be wrong is the one certain method of continuing the present confusion, to the annoyance of our successors; while boldly to adopt whatever names are clearly shown to be correct will put a stop to the trouble once for all, even if at the cost of a little temporary inconvenience to ourselves.

The present cases are all quite straightforward, and do not involve any rules for zoological nomenclature about which dispute is possible; and when I recall the fact that Mr. Alston, in his later papers, himself rejected two and clearly knew of the propriety of changing the third of the names now objected to, few will be found to resist the alterations proposed, except those who frankly say they will stick to their familiar names right or wrong, and with such persons there is no arguing.

THE PIGMY SHREW (properly *Sorex minutus*).

This animal has been commonly called *Sorex pygmæus*, Pall. (1811), but was named *Sorex minutus* by Linnæus in 1766, and should consequently be known by the latter name. The identity of the two has been universally admitted, and the late Mr. Alston, who wrote of "*Sorex minutus*, Linn.," in his 'Fauna of Scotland,'* was clearly right in so doing, and his example ought to be followed by all.

THE COMMON SHREW (properly *Sorex araneus*) and THE CONTINENTAL WHITE-TOOTHED SHREW (*Crocidura russula*).

A similar mistake to the well-known one by which our Common Hare (*Lepus europæus*) became christened with a name (*L. timidus*) properly appertaining to the Varying Hare, has arisen in regard to these two Shrews, and ought to be corrected.

As in England, so in Scandinavia, the Shrews (apart from *Crossopus*) are only represented by brown-toothed forms (*Sorex* as restricted), and Linnæus gave, in both the 10th and 12th editions of his 'Systema Naturæ,' the name of *Sorex araneus* to the commonest species, the one we know as the Common Shrew. But in France and Germany, where the commonest Shrew is a white-toothed one (*Crocidura*), the name *araneus* got misapplied to that,

* Mamm. p. 10, 188

and then, in default of *araneus*, some naturalists took *Sorex vulgaris* from a technically untenable work,* while others, amongst whom was Alston, knowing *vulgaris* to be unavailable, and not venturing to try and change the name of the White-toothed Shrew, took the next name having priority for the Brown-toothed Shrew, *Sorex tetragonurus*, Herm.†

But I venture to think that it was a mistake for these naturalists to be so half-hearted in the matter, and that had they then said, as I do now, that we ought to go back to Linnæus's name *Sorex araneus* for the Brown-toothed Shrew, and to take the next pertinent name, *Sorex russulus*, Herm., for the White-toothed Shrew, the world would soon have followed their example, and all further confusion and misunderstanding would have been avoided.

I would therefore suggest, as it is never too late to mend, that all British zoologists should now make a point of using the name "*Sorex araneus*" for our Common Shrew, especially when writing in such publications as 'The Zoologist,' through the medium of which this correct term will soon gain general currency. And in the same way *Crocidura russula* should be used for the common continental White-toothed Shrew.

NOTES AND QUERIES.

MAMMALIA.

The Names of the Mole.—In the interesting communication on this subject by Prof. Strong (p. 11), the Scottish name is given (probably through a misprint) as "moudie-wort." This should be of course "warp," being the same as the early English given on the following page, the Lowland Scots being an Anglo-Scandinavian dialect showing a close similarity with the Icelandic. The modern Dano-Norwegian is *muldvarpe*; but there is another synonym in Danish, which may be compared with Lloyd's Welsh name *twrch daeor*, "earth-hog"; it is *marsvin*, "pig of the elves," both names, no doubt, arising from the elongated snout of the Mole somewhat resembling that of a pig. The last part, "warp," seems to be the same as "warp," to twist or throw aside, and may arise either from the position of

* Linnæus, Mus. Ad. Frid. p. 10, 1754.

† Faun. Scotl., Mamm. p. 9, 1880; see also Proc. Zool. Soc., 1877, 272, footnote 1.

the fore legs of the animal, or more probably from its twisting or throwing aside the earth in its rapid burrowing, as seen from the surface.—HAROLD RÆBURN (31, Clare Road, Halifax).

Lesser Horseshoe Bat in the Washburn Valley, Yorkshire.—On Dec. 8th I was fortunate enough to meet with a good specimen of the Lesser Horseshoe Bat, *Rhinolophus hipposideros*, hibernating in an old coal-mine near to the head of the Washburn. I have the satisfaction of adding this Bat to the fauna of the Washburn Valley, as I had in Nidderdale some years ago.—WM. STOREY (Fewston Lodge, near Otley).

Whiskered Bat in Yorkshire.—I have taken the Whiskered Bat, *Vespertilio mystacinus*, several times in the Washburn Valley, as high as 900 ft. above sea-level.—WM. STOREY (Fewston Lodge, near Otley).

Seasonal Changes of Colour in the Fur of Mammals: how brought about.—I have given attention to this question for some time, and from my observations I find I must differ from the opinion held by most recent writers, *viz.*, “that there are two moults in the year; so that, in the case of animals which turn white in winter, the change is brought about by moult.” I maintain that there is but one moult in the year, and that takes place in the spring, and during the warm months this moult is complete, every hair being shed; so that before the time for taking on the winter dress arrives, the animal has an entirely new coat, which is not shed till the following year. The period over which the moult extends varies according to the necessities and condition of the animal. In some animals part of the old fur remains during the greater part of the summer, and being then old and faded, gives the animal a peculiar summer dress, there being some lapse of time between the main moult and the coming of the new hairs; the new coat growing beneath these old hairs, they gradually fall out. In most instances the new coat is darker or richer in colour than before the moult, being also much shorter and thinner; as autumn comes on gradually lengthening and thickening, and by degrees changing in colour, not by moult, but by change of pigment in the existing hairs to that of the full winter dress, which in northern latitudes is frequently pure white.—W. E. DE WINTON (Graftonbury).

CETACEA.

Grampus on the Norfolk Coast.—The occurrence of two very juvenile examples of *Orca gladiator* on the coast of Norfolk, on Nov. 13th and 19th, 1894, is a matter of some interest, if only as indicating the season of reproduction of this species, of which I have seen no certain information. These two specimens (one of which I had the opportunity of examining) were evidently very young, and probably had not taken solid food. They measured about 7 ft. 5 in. and 7 ft. 6 in. respectively in total length, and

the one I saw was very beautifully marked, all the dorsal portion being glossy black and the ventral surface yellowish cream-colour, which during life was probably pure white. There was also a patch of the latter colour commencing over the eye, and continued some distance backward. The line of demarcation between the two colours was sharply defined, and when nearly under the dorsal fin was directed upwards and backwards, and recurved upon itself in a way difficult to describe in words, but very pretty in effect. The saddle-shaped patch frequently noticed in this species was absent in these two individuals. Possibly the two may have been the offspring of one female, but of that I have no further evidence than that they were apparently of the same age.—T. SOUTHWELL (Norwich).

BIRDS.

Grebes in the Washburn Valley, Yorkshire.—I have a specimen of the Great-crested Grebe, which was picked up dead on the margin of Swinsty Reservoir, Nov. 14th, 1894. It is a young bird, and, as far as I can ascertain, this is the only instance of the occurrence of this species in this valley. I have on several occasions observed the Slavonian Grebe on these reservoirs.—WM. STOREY (Fewston Lodge, near Otley).

Red-necked Grebe on the Solway Firth.—The Red-necked Grebe is an irregular visitant to the north-west of England, but it generally appears on our rivers during the prevalence of hard weather. I never happened to come across a specimen in the pretty first plumage until last September, when a Red-necked Grebe arrived near Silloth on the 22nd of the month. It was a solitary bird, and proved to be in very perfect feather, but rather wanting in condition.—H. A. MACPHERSON (Carlisle).

Eared Grebe in the Hebrides.—The Hebrides appear to lie to the north-west of the usual migrations of the Eared Grebe; hence we rarely meet with this species upon our Highland lochs. The Little Grebe is, in my experience, the commonest Grebe to be found on the north-west coast of Scotland. The Slavonian Grebe is also to be met with sparingly every winter. On the other hand, the Eared Grebe so seldom wanders to the Hebrides that sometimes years elapse between its known visits. In January, 1895, an Eared Grebe, in winter plumage, was shot in Skye by my keeper. We compared it with a second specimen, killed on Ulleswater Lake about the same time. There was already a fairly good series of Slavonian Grebes in the Carlisle Museum, but specimens of the Eared Grebe were wanting, so that these two specimens proved very acceptable.—H. A. MACPHERSON (Carlisle).

Note on *Turdus alpestris*.—Whilst on a visit to some friends in Hungary last spring, we made an excursion up the mountains, and encamped at an altitude of 5000 ft. We amused ourselves by birdsnesting. We

were just on the higher limit of the fir-growth, where it mingles with the creeping pine. Patches of snow lay here and there. Ring Ouzels were abundant; we found half a dozen nests in the course of a morning's ramble, all containing young birds. I caught two young ones which had left the nest; they were as wild as hawks at first, and I was obliged to cram them, but they soon became tame and fed themselves. We conveyed them down to the valley in a creel in company with three young Nutcrackers which we took *en route*, the nest being in a young spruce not more than twenty feet from the ground. The sexes of *T. alpestris* are distinguishable from the time they leave the nest. I brought these Ouzels safely to England, and kept them in my sitting-room, under daily observation, where they changed, apparently without shedding a feather, into the adult mottled plumages. I never saw a single feather either in the cage or in the room during the whole time they were changing. This strikes me as very remarkable. They are now deposited in the Zoological Gardens, together with a specimen of *T. torquatus*. The difference between the birds is very striking. The female of the mountain bird is much larger than the male of the British bird; they retain their mottled plumage all the year. They invariably breed in trees from ten to thirty feet high, and the song approaches that of the Song Thrush. I think there can be no doubt that *T. alpestris* is entitled to specific rank.—J. YOUNG (64, Hereford Road, Bayswater, W.).

Bittern in Berkshire.—On Jan. 10th a Bittern (*Botaurus stellaris*) was shot by Mr. T. Dewe, of Longworth, on land in the occupation of Mr. Chandler, at Duxford, about six miles north-east of Faringdon, Berks.—A. ROBINSON (University Museum, Oxford).

Snipe drumming in January.—On Jan. 16th I was told by a man that he had heard a Snipe drumming the day before, and that same evening, whilst standing for flight-shooting, I heard a Snipe drumming close to me. The following evening, while at the same place, I heard one again. Is this not unusual so early in the season? Perhaps it may be accounted for by the mildness of the weather at that time. Many Partridges have been paired since the beginning of December.—JOHN STARES (Portchester, Hants).

Shore Lark and Black Redstart in Gloucestershire.—A male specimen of the Shore Lark (*Otocorys alpestris*) was shot at Avonmouth, October 19th, 1894, by Mr. J. R. Burge. I know of no record of this species occurring in our district for the last thirty years. On Jan. 8th I observed a Black Redstart (*Ruticilla titys*) flying about the banks of the Avon, at Sea Mills; the bird kept very close under the bank, and, on being disturbed, would fly a little way, and again alight close under the bank. Sometimes it would fly a little way out on the mud, and, alighting on a piece of wood or any projection, would vibrate its tail in the same way as

our Common Redstart. It was shot by Mr. J. R. Burge on the 10th, and proved to be a young male, in very poor condition; indeed, from the state of its lungs, I have no doubt it would soon have died.—H. J. CHARBONNIER (Clifton).

Great Northern Diver at Hastings.—On Dec. 31st I saw an immature Great Northern Diver, *Colymbus glacialis*, shot off Hastings Pier. Its weight was 6 lbs. only, and it was in poor condition.—G. W. BRADSHAW.

Thick-knee in Sussex in Winter.—On Jan. 7th I had brought to me an adult female Thick-knee or Norfolk Plover, *Ædicnemus crepitans*, shot at a small stream near St. Leonards Green, which is within the boundaries of the towns of Hastings and St. Leonards. Weight, 1 lb. 5½ oz.—G. W. BRADSHAW (Hastings).

[The occurrence of this bird in England in winter is noteworthy, for, except in the south-western counties of Devon and Cornwall, which seem to come just within the northern limit of its range in winter, its stay with us as a rule is only from April to September inclusive.—ED.]

Remarkable Invasion of Little Auks.—From all parts of the north and north-east coast reports have reached us of the extraordinary abundance during the month of January of the Little Auk, *Mergulus alle*. On the 21st of that month great numbers were observed passing south, both at sea and along the coast, and many were cast ashore in a helpless condition, exhausted in their attempts to withstand the stormy weather which has recently prevailed. Several also have been shot by coast gunners, while others have been picked up in a moribund state many miles from the sea. In the neighbourhood of Redcar, Mr. Nelson reports the occurrence of not less than two hundred and fifty, the energies of the local birdstuffers having been taxed to the utmost to preserve the numerous specimens which have been sent to them by persons desirous of keeping mementoes of so curious an occurrence. Similarly at Scarborough the taxidermists have had a busy time of it; and on the Norfolk coast Mr. J. H. Gurney has collected records of the capture or finding of more than one hundred and twenty of these little birds. They have indeed had a rough time of it, not only buffeted to death by wind and wave, or shot by the coast gunners, but seized upon in their helpless condition by the larger Gulls, and promptly devoured. In the stomach of a Great Black-backed Gull a Little Auk was found crushed but entire, and the same thing occurred in the case of a Glaucous Gull. These great birds with their powerful beaks find no difficulty in crunching their victims till all their larger bones are broken (just as the Heron treats a Water Rat) and then swallowing them whole. This perhaps is not a very wonderful feat, since a Little Auk which I received was found to weigh only 4½ oz., or the average weight of a Snipe.—J. E. HARTING.

Migration of Grouse in Winter.—We learn from several correspondents that the severe weather and snow during the third week in January caused the Grouse in Yorkshire to leave the moors in packs, and come down to the lower grounds in search of food. Mr. R. Fortune writes that on Jan. 21st a number of these birds made their appearance on the Harrogate Corporation Farm, and in the fields along the Skipton road. On the 22nd several lots were seen on the Harlow Moor and Birk Crag. In Nidderdale also they appeared in numbers on the low ground, and about Dacre Banks, the deep snow frozen hard on the top preventing them from getting food in their usual haunts. On the morning of Jan. 22nd, according to the 'Newcastle Daily Journal' of the 24th, a large flock of Grouse were seen flying over the lower part of the village of Slaley, in the direction of Tyneside, leaving their native hills owing to the severity of the winter. Snow for the previous three weeks covered the heather to a great depth; whilst alternate frosts and freshets bound up the surface beyond penetration, depriving the birds of their natural food and shelter, and causing their departure to more genial haunts. An exodus of this kind is of extremely rare occurrence; the last one, it is remembered, was during the ever-memorable winter of 1886. On the same day, Mr. Wm. Storey, of Fewston, near Otley, wrote:—"The severe weather is having a very telling effect on bird-life in the Washburn Valley. I observed to-day hundreds of Grouse coming down from the high moorlands into the valley. Several were observed feeding on the haws; while large flocks of Snow Buntings are to be seen on the margins of the reservoirs." See 'Zoologist,' 1886, p. 107.

Waxwing in Sussex.—The appearance of this winter visitor to our islands is most erratic. In some years it arrives in numerous small flocks, which disperse about the country and find food in our hedgerows and hawthorns until they are either shot or driven away; in other winters not one of the species is to be found, or at all events their appearance is not reported. The recent N.E. winds and cold weather appear to have driven some hither across the North Sea, and already we hear of a few being met with in the eastern and south-eastern counties. On Jan. 31st a little flock of six appeared in the Allotment Gardens at Rye, and two of them were—almost as a matter of course—shot. Doubtless we shall hear of more in other localities.—J. E. HARTING.

Waxwing in Suffolk.—A hen Waxwing was shot on a tree at Aldeburgh on Jan. 27th, and sent to me, in the flesh, a few days afterwards. Its crop was crammed with hawthorn berries, which had been swallowed whole. This is the third January in succession in which this very uncertain winter visitant has been obtained in Suffolk.—JULIAN G. TUCK (Tostock Rectory, Bury St. Edmunds).

Waxwing in Derbyshire.—An example of this rare winter visitor has

lately come into my possession. It was shot on January 22nd, at Smalley, near Ilkeston.—B. ROSE (Nottingham).

Waxwing in Northamptonshire.—Just as this page is going to press we learn from an esteemed correspondent, resident in the county, that a few Waxwings have lately been met with in Northamptonshire.

Brünnich's Guillemot on the Yorkshire Coast.—On Dec. 7th last a specimen of this rare Arctic visitor was shot in North Bay, Scarborough, and taken to Mr. W. J. Clarke, taxidermist, of that town, who very kindly forwarded it to me for inspection, and I had the pleasure of exhibiting it at a meeting of the Linnean Society. The occurrence of this species in the British Islands has been so rarely proved that it is of interest to place on record some details respecting the specimen now referred to. The measurements, taken while the bird was still unskinned, were as follows:—Total length, 18 in.; length of wing from carpal joint to end of longest primary, $8\frac{1}{4}$ in.; total expanse of wings, $24\frac{1}{2}$ in. On comparing it with a Common Guillemot the beak was found to be decidedly shorter and thicker; and the white line on the edge of the upper mandible, running from the gape to the nostrils, very distinct; head, nape, and back pure black, without any brownish tinge; the white of the under parts running up to a point on the front of the neck, not to a rounded arch as in the Common Guillemot; tarsi and toes dirty orange, interdigital webs dirty brown. It proved to be a male by dissection. Since this specimen was obtained, Mr. O. Grabham, of Scarborough, has reported that on Jan. 30th he picked up another on the sands at Filey, and saw a third in the possession of a man who had secured it, together with a specimen of the Ringed Guillemot, in the same neighbourhood. The Rev. Julian Tuck also has written to announce the capture of another in Cambridgeshire; but as to this specimen there appears to be, at present, a little uncertainty, inasmuch as he describes it as having some faint transverse ridges on the upper mandible, a peculiarity which suggests the possibility of its being an immature Razorbill, in which the bill might be less developed than in the adult bird. I am not aware that any such markings, faint or otherwise, are to be found on the mandibles of Brünnich's Guillemot at any age. Mr. Tuck, however, appears to have no doubt that he has correctly identified the species, and states that the white line on the edge of the upper mandible is very plain, and that the colour of the legs and feet is pale brown with darker webs.—J. E. HARTING.

Brünnich's Guillemot at Filey.—On Jan. 30th, when shore-shooting at Filey, I picked up on the sands a remarkably large Guillemot, being attracted by its size, the very distinct white line along the edge of the upper mandible, and the colour of the legs. Total length, $19\frac{3}{4}$ in.; from carpus to end of longest primary, $8\frac{1}{4}$ in.; total expanse of wings, $28\frac{1}{2}$ in. On calling upon Mr. Clarke, of Scarborough, to compare my bird with his

specimen of Brünnich's Guillemot, which was shot in North Bay, Scarborough, on Dec. 7th, and which I had the pleasure of examining in the flesh, I found, on taking measurements, that the beak of his bird is shorter, but mine is more angular and of greater depth. Mine is as black as his on the back and neck, and very much blacker than a Common Guillemot in summer plumage which I have, but it shows on the top of the head a few brownish feathers. My bird is much larger, and the tarsi and toes are yellowish olive, whereas those of Mr. Clarke's bird I had noted as dirty orange. The white on the neck in both birds runs up to a point under the chin, instead of a rounded arch as in *Uria troile*. On searching for a Common Guillemot, I found a man with two birds which he got the same day (Jan. 30th), one a Ringed Guillemot (of which more anon), and the other a Guillemot, very like, but not so large as, my Filey specimen. Its dimensions were as follows:—Total length, $18\frac{3}{4}$ in.; carpus to end of longest primary, $7\frac{3}{4}$ in.; total expanse of wings, 26 in. Black on the head, neck, and back; the white on the front of the neck running up into a point, and a very distinct white line on the edge of the upper mandible; but whereas in the Filey specimen this white line begins in front of the nostrils and runs back to the gape, in the second bird it begins behind the nostrils. The tarsi and toes were yellowish olive; webs dirty brown, as in the Filey bird. I am going to preserve them both, as I do all my birds myself, and if they are not Brünnich's, I confess I am very much puzzled, for the only difference I can detect is that Mr. Clarke's bird is shorter in the bill, and the tarsi and toes are a little different in colour, both my birds being larger than his. Of course there is nothing improbable in other specimens of Brünnich's Guillemot turning up after such severe weather and heavy gales as we have had recently; in fact, it would be curious if a gregarious bird like the Guillemot (if it sought our shores at all) should not come in small flocks, and not merely a stray specimen. As bearing on this point, I do not know whether Mr. Clarke has told you (he informed me he was going to do so) that he heard from a friend of his in Canada (Toronto, I think) that the three rarest birds he had received this season were three Brünnich's Guillemots, accounted very rare out there. — OXLEY GRABHAM (Scarborough).

P.S., Feb. 5th.—Since last writing to you, I have seen a Ringed Guillemot got here, the ordinary chocolate-brown colour—mine, as I told you, was pure black—with a very distinct white line on the edge of the upper mandible. Is there a ringed variety of the Brünnich's Guillemot? It was very far gone, and sadly knocked about, but I have managed to preserve the head and neck. The large Filey Guillemot, with the white line on the upper mandible, and light legs, I have also preserved. It was an enormous bird, a male.—O. G.

Manx Shearwater breeding on the Coast of Carnarvonshire.—It is a well-known fact that the Manx Shearwater, *Puffinus anglorum*, breeds on some of the small islands off the Welsh coast, but it is perhaps not so well known that it breeds in certainly one locality on the mainland. When visiting the Carnarvonshire coast between Pwllheli and Aberdaron, in June, 1887, Mr. C. Oldham and I saw a string of these birds flying across the bay towards two small islands; and the following year we made several enquiries about the birds from the lighthouse-keepers on the islands, and from the natives. They all spoke of "Mackerel-cocks" being occasionally seen in the bay, but affirmed that they did not breed. The keepers, however, said that they heard them at night making a noise "like a child sobbing in trouble." Visiting the same locality in May, 1893, we found a great number of dead Shearwaters along the cliffs and on the beach. All the birds had apparently died violent deaths, for their necks were broken, and many of them had their heads twisted off. In one spot on the steep grassy cliffs of the mainland we found over a score of bodies lying near some rabbit-holes, some quite recently dead, others very much older. All the older bodies had the skin torn from the breast and belly, and the skeletons were picked clean, probably by the Carrion Crows, several pairs of which birds nest along these cliffs. One of the rabbit-burrows had been dug out with a spade, and contained a dead Shearwater and a broken egg. At the mouth of two holes at the base of a turf-wall there were recent droppings, in one case hardly dry, and in digging in we found, at a depth of eight or nine feet, a few feathers and a little grass and other nesting material. Next day we found a dead Shearwater on one of the islands, and the lighthouse-keepers told us that some weeks before some men had been catching rabbits on the islands, and had bolted several Shearwaters and killed them. Probably this also explained the massacre on the cliffs, although the natives either knew, or professed to know, nothing about it. The keepers again spoke of the bird calling at night, and described the call as sounding like a deep, drawn-out repetition of the words "It's your fault;" the emphasis on the word "your." We found odd corpses along the cliffs for some distance, though they were only numerous in one spot, where the cliffs were very steep and covered with heather, bracken, and furze.—T. A. COWARD (Bowdon).

Variety of the Hawfinch.—A beautiful variety of the Hawfinch, *Coccythraustes vulgaris*, was shot by a keeper on Oct. 5th, 1894, at Berry Hill, near here, and kindly sent me by Mr. W. Hollins. The head, neck, breast and tail are pure white, except on rump, where there are a few grey feathers; the shoulders are white, the rest of wings of the normal colour—a blue-black, the bar across them being very white and large, a pleasing contrast which adds to the beauty of this bird. The legs are flesh-colour. This is one of the most striking varieties of the Hawfinch I have ever seen,

and also a very rare one, only two other varieties of this species being on record, one of which is in my collection.—J. WHITAKER (Rainworth, Mansfield, Notts).

REPTILIA.

Ringed Snake laying Eggs in Captivity.—Some months ago a country lad caught two fine specimens of the Ringed Snake (*C. natrix*). These I requested him to keep for me until I returned from my holiday. During that time the Snakes laid (between them) seventy-one eggs in the box in which they were kept. The shape of the eggs was oval, and the skin was something similar to limp parchment, and they were from three-quarters to one inch long. Some of these eggs were deposited in heaps, while others lay about the box in twos and threes, closely agglutinated. The Snakes themselves did not seem the least solicitous about the welfare of their eggs, and moved them about as they pleased. I wrote to this boy, telling him to put all the eggs in a warm manure-heap in his garden. That was the only plan I could think of for hatching them. Great was my vexation to find, when I next saw him, that he had thrown them all away. If he had done as I told him they would in all probability have been successfully hatched. Each Snake measured three feet six inches in length. Another one he gave me later on was slightly less.—C. B. HORSBRUGH (Bath).

MOLLUSCA.

Homing Instinct in Limpets.—At a meeting of the Bristol Naturalists' Society, held on Dec. 27th, Prof. Lloyd Morgan referred to the results of experimental observations he had recently made on the homing habits of Limpets. His plan of operations was to watch for the times when the Limpets were just beginning to start on a journey from their bed on the rock—commonly as the tide left them exposed—and then to lift them bodily up and place them on the rock at distances varying from six to twenty-four inches from their home. A certain proportion of those experimented upon returned accurately to the place whence they were taken—this proportion lessening directly as the distance increased, the time occupied in the return journey also increasing with the distance. Some never returned, and were either lost sight of, or attached themselves to a fresh bit of rock. These observations, Prof. Lloyd Morgan thought, negatived the hypothesis that had been advanced by Prof. Davies, of Aberystwyth, that Limpets found their way back by means of scent. He was inclined to attribute the phenomenon to touch, as he had noticed that while moving, the Limpet always touched the rock with its feelers at each step. Their range of peregrination does not seem to exceed three feet, and the rate of movement in one case observed was an inch in two minutes, including stoppages.

SCIENTIFIC SOCIETIES.

LINNEAN SOCIETY OF LONDON.

Jan. 17th, 1895.—Mr. C. B. CLARKE, F.R.S., President, in the chair.

Surgeon-Captain J. H. Walsh and Messrs. S. Dunn, J. P. Hill, D. Hooper, V. O'Rell, W. B. Stonham, and J. Wilshire were elected Fellows.

Mr. George Murray exhibited lantern-slides representing a new part of *Pachytheca*, consisting of a cup-shaped receptacle in which *Pachytheca* was found by Mr. John Storrie, of Cardiff. The walls of the cup are composed of radiating chambers like those of *Acetabularia*, and in the centre there are traces of an axile structure. Mr. Murray considered that this discovery only made the interpretation of the nature of *Pachytheca* more difficult than ever.

Mr. Arthur Lister exhibited and made remarks upon a Landrail, *Crex pratensis*, which had been found a few days previously near Axminster in Devonshire, where it had been killed by coming in contact with telegraph-wires. The occurrence in mid-winter of a bird which is a summer visitor to this country seemed to him to be worth notice.

Mr. J. E. Harting exhibited specimens of northern sea-birds which had been driven upon the east coast of England during recent gales; amongst others the Little Auk, *Mergulus alle*, of which great numbers had come ashore dead or in an exhausted condition; the Little Gull, *Larus minutus*, obtained at Whitstable on Jan. 5th; and an example of Brünnich's Guillemot, *Uria Brünnichii*, Sabine (Trans. Linn. Soc. xii. p. 535), a species which, though abundant in Greenland, N.E. Iceland, and Spitzbergen, is of such extremely rare occurrence on our coasts that not more than two or three authenticated instances of its appearance here have been recorded. The specimen exhibited had been forwarded by Mr. W. J. Clarke, of Scarborough, near which seaport it was shot on Dec. 7th last. (See p. 70).

A paper was then read by Mr. I. H. Burkill on "Variations in the number of stamens and carpels." Of *Stellaria media* about 5700 flowers were examined, showing that, towards the end of the life of the plant, the number of stamens becomes reduced. *Ranunculus ficaria* (nearly 800 flowers) showed that towards the end of the flowering period both stamens and carpels become reduced in number without their proportion being changed. Smaller numbers were examined of *Caltha palustris*, *Ranunculus arvensis*, *R. bulbosus*, *Thalictrum flavum*, *Bocconia cordata*, *Prunus padus*, *P. lauro-cerasus*, *Crategus oxyantha*, *Rosa canina*, *Quercus ilex*, and *Sagittaria montevidensis*, all of which showed, either in carpels or in stamens, a reduction in number towards the end of the flowering period. Of other influences besides age which affect the number of parts, temperature might be one, but nothing could be safely assumed.

Of a kindred nature was a paper by Mr. A. G. Tansley and Miss E.

Dale, on "Variation in the floral symmetry of *Potentilla tormentilla*, Necker." This paper, of which Mr. Tansley gave an abstract, was mainly a record of variations tending to alter the normal tetramerous actinomorphic symmetry of this flower.

ZOOLOGICAL SOCIETY OF LONDON.

Jan. 15th, 1895.—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 December, 1894, and called attention to two Tapirs recently deposited in the Society's Gardens, which he believed to be referable to Dow's Tapir, *Tapirus dowi*, of Central America.

Mr. P. Chalmers Mitchell exhibited and gave an account of a tibia and other bones of an extinct bird of the genus *Æpyornis* from Central Madagascar, which had been lent to him for exhibition by Mr. Joseph H. Fenn. With these bones was associated a skull of a species of *Hippopotamus*.

Prof. G. B. Howes exhibited and made remarks on the photograph of an embryo *Ornithorhynchus*.

The Secretary exhibited, on behalf of Mr. R. Lydekker, a life-sized drawing of *Idiurus zenkeri*, a new and remarkably small form of Flying Squirrel from West Africa, recently described at Berlin.

Lord Lilford sent for exhibition the skin of a Duck, believed to be a hybrid between the Mallard, *Anas boschas*, and the Teal, *Querquedula crecca*, that had been caught in his decoy in Northamptonshire. (See p. 55).

The Rev. T. R. R. Stebbing exhibited a specimen of a species of *Peripatus* from Antigua.

Mr. Frederick Chapman gave an account of some Foraminifera obtained by the Royal Indian Marine Survey's SS. 'Investigator' from the Arabian Sea near the Laccadive Islands. The author described the forms found in the samples sent him. As many as 277 species and varieties were enumerated, some of which were new to science. Several of the species, which were here recorded for the first time from recent soundings, had been previously known from the Pliocene deposits of Kar Nicobar.

A communication was read from Mr. P. R. Uhler, containing an enumeration of the Hemiptera-Homoptera of the island of St. Vincent, W. Indies.

A communication from Mr. T. D. A. Cockerell contained a description of a new species of the family *Coccidæ* belonging to *Lichtensia*, a genus new to the fauna of the Nearctic Region. The species was named *L. lycii*.

Mr. Sclater read some notes on the recent occurrence of the Barbary Sheep in Egypt. A flock had visited the eastern bank of the Nile above Wady Halfa in the summer of 1890. A second paper by Mr. Sclater contained some notes on the recent breeding of the Surinam Water-Toad, *Pipa americana*, in the Society's Reptile House.—P. L. SCLATER, Sec.

ENTOMOLOGICAL SOCIETY OF LONDON.

January 16th, 1895.—*Sixty-second Annual Meeting*.—HENRY JOHN ELWES, F.L.S., F.Z.S., President, in the chair. An abstract of the Treasurer's accounts, showing a good balance in the Society's favour, having been read by Mr. W. F. H. Blandford, one of the Auditors, Mr. H. Goss read the Report of the Council. It was then announced that the following gentlemen had been elected as Officers and Council for 1895:—President, Professor Raphael Meldola, F.R.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. George T. Bethune-Baker, Mr. Walter F. H. Blandford, Dr. Frederick A. Dixey, Mr. Henry J. Elwes, Mr. Charles J. Gahan, Professor Poulton, Dr. David Sharp, and the Right Hon. Lord Walsingham. It was also announced that Professor Meldola, the new President, would appoint Lord Walsingham, Mr. Henry J. Elwes, and Professor Edward B. Poulton, Vice-Presidents for the Session 1895-6. The outgoing President then delivered an interesting address "On the Geographical Distribution of Insects." He remarked that though a great deal had been written of late years on the geographical distribution of plants, mammals, birds, fishes, and reptiles, comparatively little had yet been done by entomologists to show how far the natural divisions of the earth's surface which have been established for other classes were applicable to insects. Perhaps the proportion of known as compared with unknown insects was still too small, and the classification of the known species still too uncertain, to allow anything like the same methods to be applied to insects that had been used for mammals by Dr. Wallace, for birds by Dr. Sclater and Dr. Bowdler-Sharpe, and for plants by Sir Joseph Hooker, Mr. Thiselton Dyer, and Mr. W. B. Hemsley. He then enumerated the genera of the Rhopalocera, and pointed out which of them were characteristic of the various regions and sub-regions into which the world had been divided by the zoologists and botanists above-mentioned. He also exhibited specimens typical of these regions and sub-regions. After alluding to the prosperous condition of the Society, and to the increase in its numbers and income, reference was made to various entomologists who had died during the year, and a vote of thanks to the President and other Officers of the Society having been passed, the proceedings terminated.—H. GOSS & W. W. FOWLER, *Hon. Secretaries*.

NOTICES OF NEW BOOKS.

Sir Victor Brooke, Sportsman and Naturalist: a Memoir of his Life and Extracts from his Letters and Journals. Edited by OSCAR LESLIE STEPHEN. With a Chapter on his Researches in Natural History by Sir WILLIAM H. FLOWER, K.C.B. Portraits and Illustrations. 8vo, pp. 266. London: John Murray. 1894.

THE name of the late Sir Victor Brooke is known to most people as that of an enthusiastic lover of field sports, a good shot with both gun and rifle, a hunter of big game, and for some years Master of the Pau Foxhounds. To the readers of this journal his name will be familiar as that of an observant field naturalist who made a special study of the horned ruminants, and published some excellent papers on Wild Sheep, Wild Oxen, Deer, and Antelopes, in the 'Proceedings of the Zoological Society.' From the time he began his mountaineering, at the age of nineteen, with the ascent of Sneehätten, followed by his ascent of Vaugacullen, the highest peak of the Lofodens, his love of travel and exploration knew no rest. To the pursuit of Elk and Reindeer in Scandinavia succeeded the more exciting pleasure of stalking Moufflon in Sardinia, shooting Bears and Bouquetin in the Pyrenees, riding down a Grey Wolf in the deserts of Cairo, and finally killing Elephants and Tigers in India. The biggest "tusker" on record fell to his rifle, and he was fortunate enough to bag that *rara felis in terris*, a black Panther, which constituted one of his most cherished trophies. In the Neilgherry Hills he stalked Ibex, and not content with the pursuit of these wild animals in the Old World, he proceeded in 1890 to America, where his experience amongst the game of that country, if less exciting because less dangerous, was almost as delightful. In the journals which he has left behind him, and in his letters home which have been preserved, he has left a most interesting yet unaffected record of his prowess as a sportsman, and his keen powers of observation as a naturalist. His friend Mr. Leslie Stephen, as editor of the volume before us, has given us a delightful memoir of one whom it was our pleasure and privilege to know well, and we have seldom read a brighter book. Sir William Flower has contributed a chapter on the nature and value of Brooke's scientific work, including a

list of his published papers, more than twenty in number, in every one of which we find some new and important observations on the zoology, anatomy, or palæontology of the group of mammals of which he had made a special study.

He had long contemplated the publication of an exhaustive monograph on Deer and Antelopes, and with that object had accumulated a large amount of material, not only in the shape of a fine collection of heads and horns, but voluminous notes illustrated with admirable coloured drawings by that unrivalled zoological artist Joseph Wolf. Although, unfortunately, he did not live to perfect this most desirable work, it is satisfactory to know that his labours in this direction will not have been altogether in vain, for his manuscripts and drawings have been placed in the hands of Messrs. P. L. Sclater and Oldfield Thomas, who have already commenced to utilize them by the publication in parts of a quarto monograph of the Antelopes, of which two parts are now before us. Of this work we shall have something to say on a future occasion. Meantime we must be satisfied in recommending to the perusal of every naturalist the charming memoir which Mr. Leslie Stephen has just edited. It shows very clearly how the pleasures and pursuits of a sportsman may be made subservient to the ends of science; and how in turn a little scientific training may add largely to the enjoyment to be derived from sport. Sir Victor Brooke was a fine exponent of both, and while his loss will always be mourned by those who had the privilege to know him, his memory will be kept green by the graceful tribute to his worth which is embodied in the volume before us.

Allen's Naturalists' Library. Edited by R. B. SHARPE.—*A Handbook to the Primates.* By H. O. FORBES. Cr. 8vo, 2 vols. With coloured plates and maps. London: Allen & Co. 1894.

THE publication of this series proceeds apace, and these two volumes on the Lemurs, Monkeys, and Apes, from the pen of Dr. H. O. Forbes, form an important addition to the set.

We confess to some surprise at finding the *Hominidæ* included in the same category as the Anthropoid Apes, with the observation (vol. ii. p. 203) that "with this family we reach the culminating point of the zoological tree," because we have always

considered that between the highest form of Ape and the very lowest type of man there are too many structural differences to warrant the assumption that there is any real relationship. Dr. Forbes, however, has evidently thought it convenient to introduce the genus *Homo*, for the purpose of pointing out the respects in which man resembles and yet differs from the man-like Apes, and these points, in the words of Prof. Huxley, are made clear towards the close of his second volume.

His monograph, which seems to be a very complete one, gives us in a handy form a summary of the most recent views on the classification and geographical distribution of a very important group of mammals, to which the author has added much reliable information concerning their haunts and habits. His own experience as a traveller in countries where Monkeys are found has served him in good stead; and the very useful coloured maps which he has appended, showing the distribution of both living and fossil forms, are much to be commended.

The coloured plates, twenty-nine in number, are certainly improvements upon those originally issued in 'Jardine's Naturalists' Library,' having been expressly drawn for these new volumes by Mr. J. G. Keulemans; but it is to be regretted that more pains have not been taken with the colouring, which has been very carelessly executed.

It would have been a useful addition if Dr. Forbes had indicated under the head of each species whether any living example is to be seen in the Zoological Society's Gardens.

A Monograph of the Land and Freshwater Mollusca of the British Isles. By J. W. TAYLOR. With the assistance of W. D. ROEBUCK, C. ASHFORD, and others. Part I. 8vo, pp. 64. With coloured frontispiece and numerous illustrations. Taylor Brothers, Sovereign Street, Leeds. 1894.

THIS is the first part of a new work on British Mollusca which, from the thorough mode of treatment adopted by the author, and the excellent and numerous illustrations given, promises to eclipse all previous text-books on the subject, so far as Great Britain is concerned.

The introductory matter deals with Classification, Nomen-

clature, and Synonymy, and is followed by remarks on the structure of the shell both in univalves and bivalves, and on variation generally, with observations on species, subspecies, and varieties; all these sections being admirably illustrated with explanatory figures. A noteworthy feature is the addition, at the end of each section, of the bibliography relating to each division of the subject, and this will be found extremely useful. To the list of papers on "Zoological Nomenclature" given on page 18, considerable additions might be made which would add to its completeness, but the author has probably not aimed so much at giving an exhaustive bibliography, as at supplying a few good references to authoritative memoirs. The difficulties which must always beset the writer of a comprehensive work like that which has been undertaken by Mr. Taylor, in regard to the rectification of synonymy, are no doubt very great, but on this point the author's views, as set forth in his introductory remarks, seem to us sound and practical; and the thoroughness which he has displayed in the treatment of his subject, so far as indicated by the first instalment of sixty-four pages, leads us to expect that the continuation of the work will proceed on equally satisfactory lines. The typography is excellent, and the illustrations, which are numerous, are far superior to any figures of mollusca and their shells which we have seen for a long time. Indeed, so far as it is possible to represent form and markings without the aid of colour, we do not think the shells could be more correctly represented. A coloured plate, by way of frontispiece to the first volume, is issued with Part I., and seems to us to want nothing but a little more shading on the figures to give them greater rotundity.

The first volume is announced to be completed in four parts, and the specific portion of the work will then be commenced. The distribution of species, we are informed, will be illustrated by means of coloured maps, and in this respect, therefore, there will be a further distinct advance upon previously published works on British Mollusca. It is to be hoped that subscribers will give that support which is necessary to ensure the completion of what must obviously be a very costly undertaking.

THE ZOOLOGIST

No. 219.—March, 1895.

A FLYING VISIT TO SPITSBERGEN.

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

THE record of a run across from Norway, and a visit of a few days to Spitsbergen last summer, hardly deserves to occupy space in the pages of this journal, inasmuch as the trip was made chiefly with the object of communicating with the depôt of the American Polar Expedition on Danes Island, and with little regard to zoological observation. The 'Saide,' R.Y.S., on board of which I was a guest of the late Captain Townley Parker, is an auxiliary steam yacht of 383 tons, 50 horse-power, iron frame-planked, but was in no way prepared for contact with ice. Four days' steaming from Bergen through the Norwegian fiörds, with their glorious scenery, brought us to Tromsøe, where we anchored on June 27th, in splendid weather. In the inner waters of the Norwegian coast we saw considerable numbers of Red-throated Divers, in full breeding plumage, sometimes in pairs, more frequently single birds. I noted between Bergen and Tromsøe *Larus marinus*, *L. fuscus*, *L. argentatus*, *L. canus*, *Rissa tridactyla*, *Sterna macrura*, *Mormon fratercula*, *Uria grylle*, and a few pairs of *Stercorarius crepidatus*. Eider Ducks were numerous at some stations. I once saw a solitary Eagle, and the impression left was the general poverty of bird-life in the fiörds. About sixty miles south of Tromsøe, the fiörd, which is very narrow, winds through a lovely, and, near the shore, well-cultivated country. Between latitudes 68° and 69° N. the shores are laid out in hay-fields; we saw neat farm-houses, churches, and pretty dwellings. The hill-sides in the back-ground are clad with foliage, chiefly birch. At

this date patches of snow lay here and there on the slopes, reminding us of what might otherwise have easily been forgotten, that we were in the same parallel as treeless Disco on the west coast of Greenland, and the frozen area of the Parry Archipelago. Here the surface temperature of the sea-water of the fiörd was 58°, that of the air 53°.* As soon as the anchor dropped, at 2 a.m., I went ashore, and made for the birch-woods that cover the small island on which the town of Tromsøe is built. It was a delightful morning, the sky clear and unclouded, with a breeze just sufficient to render walking in the woods not oppressive. The birch, the "lady of the woods," was then decked in tenderest green, and her million leaves trembled with gentle murmur to the breath of the south wind. The wild flowers grew in rich profusion in the meadows adjoining the sea-shore and in the dank vales that ran up to the birch-clad hills. Now and again the musical tinkle of a cattle-bell sounded, answered by the croak of the Ravens or the merry chatter of Magpies. I walked for several miles through the birch-woods before I fell in with a colony of nesting Fieldfares. I saw the birds at intervals flying over the trees with food in their bills. At length the harsh cries of these birds, darting about amongst the branches, showed me I was close to a colony, and I stood in a grove where some twenty nests were visible. Many of them contained young, which the parent birds were feeding, though they showed by their harsh screams that they did not approve of my being there; one nest had five fresh eggs in it. During my ramble I did not find a Redwing's nest.

I several times almost trod on males of the Willow Grouse, *Lagopus albus*; they arose at my feet with a loud cry, flew a short distance, and then settled with outspread wings, and commenced running about; this to allure me from the hen bird and young, which in one case I nearly stepped on. The anxiety of the mother was intense: scattering her young in the first place with her feet, she then ran round and round to gather them together; at times she crouched, with every feather upstanding, within a few paces of me, then dashed here and there and everywhere collecting her brood. I remained still until this was accomplished, and the parents had departed with their young. The male bird, in his white and orange-tawny plumage, is a fine-looking fellow. I found

* Temperatures recorded in Fahrenheit.

one nest from which most of the eggs had been hatched, but there were a couple left. I came across the nest of a Willow Wren with seven eggs much incubated; the inside lining was entirely composed of the white feathers of the Willow Grouse.

The Tromsøe Museum is well deserving of a visit. It contains most interesting collections from northern Norway, Finmark, Spitsbergen, Novaya Zemlya, and other parts of the Polar area. The Museum authorities have exercised a most wise discretion in limiting the collections to illustrate the Natural History, Zoology, and Geology of the far north.

The coaling of the yacht being completed by 4 a.m. of June 28th, we left Tromsøe under steam. The temperature of the water was 53°, and that of the air the same. Our course was through Gröt Sund, Kaag Sund, and to the open sea between the islands of Loppen and Arnoe; the latter, which I estimated at about 1200 feet, has stunted birch-woods growing half way up its sides. By mid-day we were well outside of the islands, meeting with a heavy, confused sea, which continued throughout the day; the temperature of the water was 47°. The weather, which had looked threatening for some hours past, now turned into a north-west gale with rain and fog, and the wind increased in strength till mid-day of June 29th, when the ship was hove to for a couple of hours. By 4 p.m., the sea having moderated, we proceeded under steam, the air temperature being 39°, that of the sea 40°. At 6 p.m. we got a good observation, which put our position to the eastward of Bear Island. The gale and current had drifted us sixty to seventy miles out of our course, which had been laid for the westward of Bear Island. We bore up to pass, if the ice we expected to meet with permitted, between Bear Island and the south cape of Spitsbergen. To our surprise we found the sea to the eastward of Bear Island entirely free from ice, I should think an unusual condition of affairs; indeed the only piece of ice we sighted was a small berg floating some sixty feet above water. At 3 a.m., June 30th, we sighted Bear Island, bearing west, and we sounded in 36 fathoms. Drizzling rain set in; the temperature of the air was 34°, that of the sea 40°. Towards mid-day the weather improved, and we passed through alternate areas of fog and bright sunshine; the sea had decreased to a long undulating swell. I noted during the day a single Pomatorhine Skua, many Kittiwakes, plenty of Brünnich's Guillemots, Black Guillemots, Glaucous Gulls,

Fulmars, and Little Auks. I noticed a pure white Brünnich's Guillemot* within twenty yards of the ship's side. At 4 p.m. the south cape of Spitsbergen came into view, bearing N.W. by N., some twenty miles off; the temperature of the air was 34°, of the sea 38°. The weather being very fine we hauled in nearer the land, and steamed northward with the bold mountainous coast of Spitsbergen on our starboard.

By mid-day of July 1st every cloud and wreath of mist had disappeared from sea and land, and the peaked mountains and ice-fields and glaciers stood forth in all their grandeur and glory. In the finest of Arctic summer weather we steered into the estuary of Ice Fiörd. The temperature in the shade was 47°, in the sun 61°, of the sea 39°; except for our surroundings of snow-clad peaks and vast glaciers descending to the sea on the north side of the fiörd, we could scarce believe that we were in Polar regions. As we proceeded up the fiörd we could see from the foreyard that the pack-ice stretched continuously from Cape Boheman to Hyperite Hat, but the entrance to Advent Bay was clear. I was surprised to see what a long extent of the foreground on the south side of the fiörd was bare of snow, and even up to a height of a thousand feet the mountain slopes were mostly clear.

Animal life was fairly abundant in the fiörd. Thousands of Little Auks and Guillemots floated on the waters, or might be seen high overhead winging their way in flocks to their breeding haunts; the northern Dovekie and Puffin were far less numerous. Now and then a Seal popped its head above water, and one small Whale showed itself close to the bows of the ship. When we reached the entrance of Advent Bay, an inlet on the south side of the great Ice Fiörd, the scene was enchanting. The bay, full of fragments of floe and berg, glistening under the bright sunshine, the sea without a ripple, and the ship gliding to her anchorage between the loose pieces of ice formed a delightful picture. The position we anchored in was that surveyed and charted by Mr. Lamont,† and is by far the best anchorage in Advent Bay. A ship of large size can find ample depth and security close to the abruptly sloping shingly beach. Immediately

* I procured a similar albino example of this species from West Greenland, which is now in the British Museum.

† 'Yachting in the Arctic Seas,' 1876. Appendix I.

after the anchor was let go, at 6 p.m., several of us went on shore. Some of the party proceeded along the south side of Advent Bay; I and a sailor to the south-west along the shore of Ice Fiörd. I searched the slopes of the hills for Ptarmigan, but only found their feathers, droppings, and dusting places. Seeing a Reindeer moving below us to the westward and following the shore-line, we went in pursuit. As we walked along an endless procession of Fulmars accompanied us. They were heading the same way as ourselves, evidently bound for a roosting place, but avoiding the sea they passed along the foreshore between the slope of the hills and the water. Hundreds of these birds passed close overhead and on each side. They showed no fear, many sailing past within ten feet of us. Raising a rifle or shouting only made them sheer off a little, with a slight shudder of the wings and a blink of the eyelid over their lustrous black eyes. I had never before seen a vast body of Fulmars deliberately leave the water and take to a passage overland. In the most northern latitudes, and when the sun is at its highest altitude, in June and July, I have noticed some slight appreciation by birds of the hour which in lower latitudes would be midnight. They are silent for a short time, they seek their resting places or cover their eggs; but the period of repose is brief, and long before the sun has passed from the northern to the eastern quarter of the sky they are again in activity. Nevertheless there is an indefinable something in the surroundings which tells the traveller, without reference to his watch, that the hour which should be midnight is at hand.

We found the Reindeer about Advent Bay so tame, that I presumed we were the first who had invaded their haunts that season, and recollections of previous onslaughts had faded. Following the track of the Reindeer which we had seen, led us to a valley that opens on to the shore of the fiörd some six miles from our anchorage. Seeing a Reindeer feeding on the slopes of the glen we stalked it. This involved crossing a rushing torrent of icy cold water up to our waists. Crawling and creeping, I got within eighty yards of where I supposed the animal to be, and, cautiously peeping over the knoll, saw the deer feeding. As its stern was towards me, I gave a low whistle, in the hope that the animal would turn and give a side shot. It turned, and to my surprise, instead of making off, walked up to me with head elevated sniffing the air. I shot the poor creature within a few

yards of me. The death of the Reindeer was the signal for all the Glaucous Gulls in the valley to congregate around us. Like Vultures in the tropics, they assembled from each side of the glen, and the *grallock* was hardly removed from the quarry before fifty of these great white gulls were tearing and fighting over it. On running up from where I fired to where the deer fell, I nearly put my foot on a Purple Sandpiper, which bustled off her nest and four eggs. Putting my cap over them, I returned shortly to pick them up, and the Sandpiper was running round and round within a few feet of my cap, but on seeing me crouched and made off, like a mouse, amidst the short herbage. The nest was a slight depression lined with moss and a few dried leaves. Three more Reindeer were seen further up the glen, and they allowed me to approach so near that I shot another with hardly the pretence of a stalk. It seemed so cruel to shoot these confiding animals that I made up my mind not to do it again, and I kept to this resolution. My companion and I had hard work dragging the carcasses of the two deer to the sea-shore; our strength would not allow of carrying them another six miles to the ship. On sending for them the next day only their skeletons and hides were found; the Glaucous Gulls had picked them to the bone. The experience of my shipmate, Colonel Bond, who went out after Reindeer in another direction at the same time as I did, was very similar to my own. Meeting with a buck and two does, he shot the former; the latter, instead of making off, came within three yards and smelt at him. Like a good sportsman, his rifle was likewise returned to its case, and the animals required for the ship's larder were shot by the sailors.

During July 2nd, Bond and I went in the steam-launch towards the head of Advent Bay. The water there is so shallow we could not get within half a mile of the muddy shore in the launch, but we landed from a light skiff we had in tow. Our object was to visit the small lake mentioned by Mr. Lamont as the place where he met with both Brent and Bernacle Geese. It seems to me very unlikely that so experienced a sportsman and good field-naturalist could by any possibility be mistaken in his identification of these two species. I quote his words: *—
“ There is a pond a little in-shore at the end of Advent Bay, and

* *Op. cit.* pp. 284, 285.

about it were large flocks of Brent and Bernacle Geese. The latter were moulting, and therefore not able to fly, but they were able to run like hares. I however got a hundred by concealing myself in one direction while I sent round a man to drive them from another. The flesh of the latter is coarse and ill-flavoured compared with the more delicate meat of the Brent Goose." On getting within sight of this piece of water I scanned it very carefully with my glasses: there were some fifty Brents on it, and some Eiders, but no Bernacle. Bond hid up on the sand-spit which separates the lake from the bay, and I went round and drove the geese over him. He killed three Brents out of the flock, and as they passed close to him he was able to corroborate my view that all were *Bernicla brenta*. Our experience in no way shakes my confidence in the correctness of Mr. Lamont's identification. It was two weeks later in July when he met with the Bernacle Geese at this place, and it was July 22nd when Mr. Eaton obtained them on a small lake inland from Wiide Bay. Probably it will be found that the Bernacle Geese in Spitsbergen, like the Pink-footed, nest inland, and bring down their goslings to the sea-side lakes in the summer. Ascending to some little height, I noticed that a broad and level valley, at this time of the year much bared of snow, with a series of lakelets in it, extends for several miles from the head of Advent Bay. It looked a likely stretch of country to investigate, and much did I regret that there was not time to explore it. I hope it may receive attention at some future period. Near the lake a pair of King Eiders, the male in adult plumage, passed me; I secured the female, and on our return by water to the yacht, we shot two more *Somateria spectabilis*, and several common Eiders and Dovekies. We also noticed the first Ivory Gull.

On July 3rd we left Advent Bay, and anchored on the west side of Green Harbour. About a mile and a half north of this anchorage the land near the shore is low, and there are two shallow pools of water not far from the beach. There we came across two pairs of Grey Phalarope. This bird has a very pretty habit—which I have noticed as well in other parts of the far north—of standing in shallow water, and with its wings raised and meeting above the back, skipping and flickering when taking its bath. The Grey Phalarope in breeding plumage is a lovely bird, and its bright garb seems quite out of place with the surroundings

of snow. No other bird in the Polar Regions can compare with it in richness of colour. We were fortunate enough to find a nest, a mere depression in the turf containing two eggs. The male bird was on the nest. We proceeded after this in the steam-launch to the extreme head of Green Harbour, a distance of some seven miles, and landing, visited a most interesting glacier. A single Buffon's Skua was seen and shot there. Hundreds of Kittiwakes and Glaucous Gulls were gathered together on the sands and blocks of ice at the head of this bay, and a few Arctic Terns and Ivory Gulls with them.

The next day I was ashore early. The temperature on the fell marked 50° ; it felt very warm. I came across eight Pink-footed Geese feeding near the shore; I was within eighty yards of them. When they arose six flew away to the other side of Green Harbour, and one pair took to the fell. Following them up, I again disturbed them, but instead of leaving, they sailed round in a great circle, now and again alighting on a hillock or spot of rising ground. From their actions it was easy to judge their nest or young were not far off. I had not time to continue the search. Near a morass I picked up the withered wings of a wading bird, which I afterwards submitted to Professor Newton, who gave me the following opinion:—"The withered wings which you found in Green Harbour seem, after comparison, to be those of *Tringa alpina*, of medium size, *i. e.*, neither *T. schinzi (vera)* nor *T. americana*; but I would not swear to their identity." I think, however, we may, without much scruple, include the Dunlin, *Tringa alpina*, as a straggler to Spitsbergen.

We left Ice Fiörd, on our way north to Danes Island, on July 5th. At 3 p.m. of that day we were about the approximate position of Goshawk Rock, which is charted as twenty feet above water. No such rock appears above the surface in fine weather, and it is probably a hidden danger, to be carefully avoided. As the sea was quite smooth and the weather fine, we got into the dingey and took a series of soundings. About two or three miles from where the yacht lay was a low island close inshore of Prince Charles Foreland, and bearing south-east of Goshawk Rock of the chart. We pulled to this skerry, which is a low island of schistose rock about 50 acres in extent. We landed after some little trouble, for even in this calm weather the swell broke heavily on the rocks. On scrambling up we found the centre of the islet

more depressed than its edges, and covered by a saturated moss, in which lies a small tarn of fresh water. Being some distance from land and surrounded by open water, this islet offers a safe asylum to the Eider Ducks and Brent Geese. I never saw a limited area more thronged with Eider fowl than this was. I calculated that on our first landing the skerry must have been occupied by more than five hundred pairs of Eiders and some twenty pairs of Brent Geese. The Eiders (all *Somateria mollissima*) were nesting in colonies, and so tame that we had almost to push the ducks off their nests. Overhead floated several pairs of Skuas (*S. crepidatus*), and these insolent marauders flew to the nests, when uncovered by the owner, and scrambled for possession of her eggs with us. We had to poke at them with the barrels of our guns to drive them off, but they secured several and sucked them at our feet. A pair of Red-throated Divers had their nest, with one egg in it, by the side of the tarn. We only found two nests of *Bernicla brenta*; each contained three eggs, and the owners were very unwilling to leave them. These eggs were embedded in a soft mass of grey down. Arctic Terns screamed overhead, and we found one or two of their nests and eggs. A few pairs of Purple Sandpipers seemed to be breeding. As fresh meat was required on the yacht, several of the Eider Ducks were shot, but we had to be careful in gathering them up at once, for if left on the ground, and we moved on fifty yards, they were immediately torn to pieces and devoured by the Glaucous Gulls. In the midst of the confusion arising from the attack on the ducks, a fine Snowy Owl rose from the highest spot of the skerry and sailed over our heads. The two men from the dingy joined us, and helped us to carry our burdens to the boat. We returned to the ship with thirty Eiders and one hundred and sixty of their eggs, which were nearly all quite fresh. These birds and eggs were highly appreciated. The northern Puffin, *Mormon glacialis*, was swimming in numbers near the skerry; it struck me as looking decidedly larger when on the wing than *M. fratercula*. These birds carry away a great quantity of lead, and are somewhat difficult to secure in the sea, for even when shot through the head they are well able to dive.

The Snowy Owl has hitherto been recorded as a very rare species from Spitsbergen. Professor Newton and Dr. Malmgren mention one being shot on a piece of floating ice between Verlegen

Hook and Shoal Point in July, 1861. Dr. Theel records a second example from Mossel Bay. In the neighbourhood of Advent Bay, on July 2nd, I came across a low mound, which was undoubtedly used as a resting-place by this species. Many of its unmistakable feathers lay about, and numerous castings, which proved to consist entirely of the remains of the Little Auk.

The same day Colonel Bond, on the shore of Advent Bay, saw a Snowy Owl, which rose from the ground close to him. He was after Reindeer at the time, and having only a rifle could not secure it. On July 5th, as already mentioned, we observed a fine Snowy Owl on the small island that lies off the west side of Prince Charles Foreland, approximately in lat. $78^{\circ} 22' N$. Skipper Olsen, of the 'Familien,' whom we met in Smeerenburg Bay, gave me the skin of one, which he had shot at Welcome Point, lat. $79^{\circ} 50' N$., on July 1st. Capt. H. C. Johannesen brought to the yacht, on July 8th, another, which had been shot a few hours previously on Amsterdam Island. This was a female, and one of the fattest birds I ever dissected. This bird had evidently been sitting, for its breast was quite bare, and showed signs of incubation. The stomach contained remains of *Mergulus alle*. In our brief visit to Spitsbergen we obtained two specimens, saw two more, and found traces of them. I had, prior to my visit, accounted for the rarity of the Snowy Owl by the entire absence of the Lemming from Spitsbergen, for in Grinnell Land and Novaya Zemlya, where the Snowy Owl is abundant in summer, so also is the Lemming. As, however, the bird appears to be able to live well in Spitsbergen on the Little Auks, which doubtless it can procure at their breeding haunts in any number, this line of reasoning does not hold good. Is it possible that the Snowy Owl has only of late years discovered the capabilities of the Auk-fells of Spitsbergen? If such be the case, we may expect to find this bird increasing yearly in numbers in Spitsbergen, and this will be an interesting point for future observers to determine.

I do not find in my journal of the cruise any further notes of zoological interest connected with Spitsbergen. After communicating with the depôt of the American Polar Expedition on Danes Island, where we found Professor A. Oyen, of Christiania, in charge, and taking a mail for Europe on board, we returned to Tromsøe, which we reached on July 12th.

NOTES ON THE SEAL AND WHALE FISHERY, 1894.

BY THOMAS SOUTHWELL, F.Z.S.

I MENTIONED last year some of the vicissitudes of Newfoundland Sealing, showing how much depends upon a right judgment as to the position of the drifting pack on which the Seals would be found, and that not all the long experience of those who year after year have studied the uncertain movements of the ice, carrying with it the breeding Seals, can do more than form an approximate estimate of their whereabouts; and even then unlooked-for changes in the force or direction of the wind, or in the intensity of the frost, may frustrate all their wisely-laid plans. This was fully exemplified in the past season.

The reports state that the spring of 1894 was a very stormy one, and that the ice was in consequence in constant motion, and difficult to navigate, thus often rendering the breeding Seals unapproachable.

When the steamers sailed on March 10th the ice was somewhat off the land, and all of them, with the exception of the 'Hope,' kept outside; as the Seals whelped on the inside of the ice, the 'Hope' struck them at once just to the N.E. of Cape St. John; but two days afterwards, a N.E. gale coming on, they all drifted into Green Bay, where they remained until the beginning of April, when the 'Hope' returned with 16,499 Seals, the largest number obtained by any one vessel of the 22 steamers. The other steamers could not get amongst the Seals; two or three of them, however, contrived to do fairly well, but the rest did very little on that part of the coast, and no old Seals to speak of were got later in the season. The 'Algerine' killed 10,719 young Harp Seals in the Straits of Belleisle, and the 'Labrador' took some 2400 young Hooded Seals off Cape Anguille, and the remainder of her cargo further to the westward. Whilst butting through the ice she had the misfortune to lose two men; one poor fellow fell through the ice under her bows, and a companion, coming to his assistance, also lost his footing; the vessel, at the same time steaming ahead, crushed both of them; one sank, but the body of the other was recovered. The shore-fishery by landmen and schooners was very successful, and probably 150,000 Seals were thus taken.

Of the 22 steamers, one, the 'Newfoundland,' landed about

6012 Seals at Halifax. We have therefore to deal with only 21; these captured a total of 152,821 Seals old and young, the 'Hope' heading the list with 16,499, followed by the 'Diana' with 15,122; only two other vessels had over 10,000, the average of the 21 being 7277, an improvement upon the previous season, which averaged only 5866; but still far from a paying cargo.

The Greenland sealing was again very unimportant, only 4712 being brought home by three vessels. In addition to this a vessel called the 'Alert,' which acts as a carrier sailing from Peterhead to Cumberland Gulf with stores for Mr. Noble's station there, and returning with produce, brought home 7000 skins, making a total import of 11,712 from the northern fishery; added to these, 13,458 from Newfoundland gives a total of 25,170 Seals taken by six Scotch vessels (including the 'Active'), producing 269 tons of oil, which at £17 per ton, and skins at, say, 4s. each, represents a sum of £9607, as compared with a like valuation of £9915 in the previous season.

The year 1894 marks a new era in the declining history of the British Whale fishery. For the first time since the year 1788, Peterhead, which port has in its palmy days sent as many as 29 ships to the Arctic Seas, has been totally unrepresented in either the Greenland or Davis Straits fishery, except by the small carrier already mentioned, in the employ of the station in Cumberland Gulf. The last Peterhead vessel, the 'Windward,' which Capt. David Gray commanded in 1893, has been sold to the Jackson-Harmsworth Expedition, and, should her commander have been successful so far in his arduous undertaking, is now wintering somewhere in the neighbourhood of Franz Josef Land. Dundee sent out only eight vessels, and, should report prove true, it is probable that three or even four of these will be laid up next season. Present prices are so low, and the produce, even when obtained, so difficult to dispose of, that there is little inducement to continue the fishing. It seems not unlikely also that the present financial crisis in Newfoundland may have the effect of materially reducing the number of the sealing fleet which will leave the ports of that colony in the spring.

The three vessels which sailed from Dundee last season for the Greenland fishery were the 'Active,' the 'Diana,' and the 'Polar Star.' The first captured two small Right Whales,

yielding only 20 tons of oil and $15\frac{1}{2}$ cwt. of bone; the second, one Whale, with 8 tons of oil and 4 cwt. of bone; and the third, one Whale, of 10 tons of oil and $7\frac{1}{2}$ cwt. of bone;—a miserable return compared with the captures at the Straits fishery, which averaged over 16 cwt. of bone each; and this deficiency was not made up by the sealing, which was equally bad. Most of the Whales taken of late years in the Greenland Seas have been very young animals. Experts are therefore of opinion that there must be breeding Whales there, although they cannot succeed in finding them. It may be that the older Whales have become extremely wary, and that it is only the young and inexperienced which expose themselves to capture.

Five vessels fished in Davis Straits, killing 15 Whales and 1261 White Whales. Of these the most successful was the 'Eclipse,' which returned with five fair-sized Whales, yielding 95 cwt. of bone; the 'Terra Nova' had also five Whales, producing 70 cwt. of bone; the 'Nova Zembla' four; the 'Balæna' one Whale and 820 White Whales; the 'Esquimaux' had to be content with 432 White Whales only. All the vessels experienced very bad weather early in the season, which so delayed them that the majority of the fleet missed the "spring fishing," and there was much weary waiting before they were rewarded by a capture. At the end of 30 days the 'Nova Zembla' was only 500 miles from home.

Capt. Guy describes the summer as one of the worst he had ever experienced, extremely cold, foggy, and gales of wind of almost daily occurrence. On July 8th, being beset in the "fast" ice, the vessel had a very narrow escape of being crushed; a huge iceberg was observed approaching, from which there appeared to be no way of escape, and all prepared to leave the ship. Down came the iceberg, the lower edge of which caught the ship's quarter; such, however, was her strength that, instead of the vessel being crushed as was expected, she heeled over on her broadside, and, after being in that position for about four hours, the iceberg sheared off, and she righted, to the relief of her officers and crew, whose anxiety was intense. It was not till Aug. 23rd that Capt. Guy killed his first Whale, and three others were secured at short intervals during the next few weeks. On Oct. 1st the 'Nova Zembla' bore up for home, and had a splendid run of 14 days.

The 'Terra Nova' had a curious experience. About 45 miles off Martin's Mountains, the southern point of Lancaster Sound, Capt. M'Kay killed his first Whale, a very large animal with 12 ft. bone. When cutting it up an old harpoon was found embedded in its blubber, which bore the name of the whaler 'Jean,' of Bo'ness, and was dated 40 years back. This vessel was lost in the ice 37 years ago, and the finding of the relic excited a considerable amount of interest. The steel is said to have been as bright as the day it was made, and the Whale seemed to have sustained no injury from it.

The 'Balæna' killed her only Whale on Sept. 23rd; a fair number had been seen, but it was not until that date that they were enabled to effect a capture. In Elwin Bay, Prince Regent's Inlet, they killed 820 White Whales in the month of August. Capt. Fairweather reports a ghastly discovery in this locality. Three vessels were cruising in concert, looking for White Whales, when Mr. Fairweather, jun., being on shore with a seaman, observed three corpses lying together not far from the shore, and "a slight scrutiny revealed the fact that a party had died of starvation. It was evident that the group, two men and a woman, had resorted to cannibalism before death intervened to end their sufferings. . . Lying scattered about in the vicinity were a number of human bones, skulls, &c. . . It is supposed the dead Esquimaux were natives of Lancaster Sound, who had travelled across the ice in search of depôts of stores left by old navigators." A large number of relics, the property of these poor people, were brought away, amongst which was a telescope engraved "Feathers, Dundee." Capt. Fairweather states that a number of years ago, when in command of the 'Thetis,' he presented a similar telescope to an Esquimaux, and he is of opinion that the instrument discovered by his crew is the same.

The total produce of the Whale fishery was 20 Right Whales, 1261 White Whales, and 49 Walrus; these yielded 412 tons of oil and 14 tons 7 cwt. of bone. The former may be valued at £17 per ton, or £7004; and the latter, allowing for under-size bone (£1500 per ton for the former, and £750 for the latter, about 10 per cent. of the whole), at a sum of £20,448, or a total of £27,452, as against a like valuation of £41,449 in the previous season.

The British vessels have not repeated the experiment of a

visit to the Antarctic Seas, but the Norwegians were more persistent, prosecuting the sealing there with vigour, laying up their vessels at the Falkland Islands, and employing a carrier to bring home their produce. This vessel, on her return after last season's fishing, was wrecked on the Goodwin Sands, the salvage realising very little; and the Norwegian ships, I am informed, do not intend to continue the enterprise in that direction,—fortunately for the southern Seals, which would otherwise have been quickly exterminated.

I have, as on former occasions, to express my indebtedness to Mr. David Bruce and Mr. R. Kinnes, of Dundee; to Capt. David Gray, of Peterhead; and Mr. Michael Thorburn, of St. John's, Newfoundland, for their kindness in supplying me with information.

ORNITHOLOGICAL NOTES FROM NORFOLK.

By J. H. GURNEY, F.L.S.

THE following notes for 1894, as will be seen, have been chiefly collected from the observations of others, and I have been careful in every case to specify the source of the information. We have so many good naturalists in Norfolk, that there is seldom any need to personally verify the reported occurrence of rare species.

JANUARY.

8th. A Black Guillemot and a female Eider at Hunstanton (J. G. Tuck, Zool. p. 64).

13th. About this date a Scaup was shot on the river at Dunston, four miles south of Norwich. This is some way inland, but at the beginning of the month a good many of these birds appeared at Blakeney and other places on the coast, and I received one alive, but it soon died. Others were shot, being tamed by the very severe weather. The 4th was the coldest day experienced in Norfolk for twenty-seven years, but on the 10th the frost broke up.

FEBRUARY.

1st. A female Great Bustard was shot at Costessey, near Norwich, by a man named Paul, of which a full account has been given by Mr. T. E. Gunn (Trans. Norfolk Nat. Soc. v. p. 656). Its gizzard contained an angular flake of flint (which must have been

an awkward morsel to swallow) and three small pieces of pottery, one of a blue colour, recalling to mind New Zealand Moa stones (see the coloured figure in 'The Ornithological Miscellany,' vol. iii. p. 240), which were sometimes of a bluish hue. The last occurrence of the Great Bustard was on Jan. 19th, 1891, when six others were killed in different parts of England, and, like this one, were all females.

4th. Signs of spring. My Eagle Owls both received their master with many loud snaps, which always indicates the nesting impulse, and both sexes scrape holes the first fine spell of weather which comes after January. This snapping noise is caused by the withdrawal, not the meeting, of the mandibles, but the action is so rapid that it is very difficult for the eye to follow it. The 24th of March is about the time these Owls usually lay their first egg, and incubation lasts about thirty-six days, the old bird beginning to sit directly the first egg is laid. On a fine day she will leave her young ones, when about a week old, to the warmth of the sun, but will run along the ground to them if anybody goes into the cage. She is so savage at this time that the intruder will stand a very good chance of getting a blow on the head or neck from those sharp talons. My father reared a good many Eagle Owls, but his success was as nothing compared with that of Mr. Meade Waldo, who reared ninety from one female bird.

10th. The White-shouldered Eagles, *Aquila adalberti*, Brehm, brought from Spain in 1872 by Lord Lilford, and given by him to my father, being supplied with boughs, for the first time made a nest, but no eggs were laid. They are fond of eating those of other birds when given to them.

MARCH.

This month was fine, warm, and dry. On the 4th two vinous-breasted Rock Pipits, of Scandinavian origin (*Anthus rupestris*, Nils.), both males, were shot at Cley by Mr. E. Ramm. This well-marked race never occurs on our coast in any month except March, at which time, like the Black Redstart to be next mentioned, it migrates eastwards, towards Denmark.

23rd. A Black Redstart at Framingham; during this month Black Redstarts were also seen at Yarmouth, and others were reported in South Yorkshire and in Kent.

APRIL.

11th. A Spoonbill, *Platalea leucorodia*, was seen at Hickling.

13th. The Rev. M. Bird saw three Garganey (two ducks and a good drake) in the Broad district; and on the 17th he saw a Jack Snipe and found two Shovellers' nests; and a few days afterwards Mr. Southwell saw several Shovellers at Hoveton "broad."

25th. A White Wagtail, *Motacilla alba*, caught at Lound and taken alive to Mr. W. Lowne, had the pearl-grey colour of the back continued to the rump, as in the three previous Yarmouth specimens. It was in very good health when I saw it alive in July.

MAY.

At Scoulton Mere I found that the gathering of eggs of the Black-headed Gull had ceased on the 9th, the take having been about 7200 eggs, a much larger number than was obtained in the dry spring of 1893, or in 1892, but less than half what used to be collected when I first remember these Gulls nearly thirty-five years ago. The price is now a shilling a dozen eggs, and they are eagerly snapped up in small quantities at that figure, none coming to Norwich market from Scoulton in 1894, though there were some there on April 25th from another quarter.

12th. Ten Shelducks were seen at Horsey by Mr. Bird, who on the same day found nine Kestrel's eggs in one nest, which was on the ground at Ruston. Both the number and the situation are unusual. A Spoonbill appeared on Breydon (A. Patterson), and eight Dotterel, *Eudromius morinellus*, at Winterton (Bird).

14th. Four more Dotterel at Fakenham (G. Davey).

15th. Chiffchaff's nest at Keswick.

17th. A pair of Black Terns were seen by my son over Keswick mill-pond.

21st. My son put a Blackbird off her nest of five eggs, two of which were spotless, and two almost spotless, the fifth being very pale but otherwise typical.

25th. Received a Short-eared Owl from near Bury, a pale-coloured one, which is generally the case with those obtained in summer.

29th. Three Crossbills at Blakeney (H. Pashley).

JUNE.

19th. Received a Hawfinch from Bury, which Mr. W. H. Tuck thinks had been hatched about the middle of April, the time they begin to pair according to Yarrell. I protect Hawfinches, and am rewarded by their eating my white-heart cherries, to which I object, and yew berries, to which they are welcome. At Wiveton Mr. Pashley tells me they stripped three large rows of peas in one night, throwing many of them on the ground in mere wantonness. When recording the two Little Bitterns at Rollesby Broad last year (Zool. 1894, p. 88), I was not then aware that there was also another on a small lake near Watton, thirty-two miles west. More fortunate than its relatives, it was carefully protected, and the owner was rewarded by the same or another returning, about May 21st, to spend the summer on his water. Invited to come and hear its curious note, I acquiesced in its resemblance to the sound made by a paviour ramming stones, or the distant barking of a dog. Nothing would induce it to rise. On coming home and contemplating a young one in a cage at Keswick, and noticing the extraordinary drawn-up thinness of it (exactly like Mr. Griffith's picture (Zool. 1894), except that its neck was often even more contracted in breadth, while in length elongated to its utmost), and its immovability, and resemblance to faded rushes, I can well understand that it might be within a few feet and yet be invisible. Mr. Griffith's photograph, though very good, does not show the peculiarity of the legs. The tarsi are sometimes at different angles, and the feet point in different directions, without incommoding the Bittern in the least. By the end of June it was clear to the owner of the lake that there were two Little Bitterns, unless they are marvellous ventriloquists, for one "barked" on one side of the mere, and one on the other. On the morning of July 25th Mr. P. reported that after a heavy rain one of them sat on the top of the Ducks' enclosure, sunning himself and "barking" for ten minutes. I did my best to stimulate search, and a nest of some kind was found, but its ownership was not proved, and no eggs were laid. By the 22nd of August the birds had gone.

28th. A new colony of about thirty Herons' nests was noted at Reedham (W. H. Hudson). A fully-fledged Hawfinch was caught at Beeston Regis (T. W. Cremer), and a male Crossbill

was shot at Cromer, where a pair of these birds appeared in a large garden in the town, with four young ones able to fly, but probably bred in the woods near. I soon afterwards heard from Mr. R. Clarke that several flocks of Crossbills had been seen in the neighbourhood of Sandringham, and Mr. Cordeaux noted some in the Humber district ('Naturalist,' 1895, p. 2). In the autumn they again appeared near Swaffham, and I think they are becoming much commoner than formerly.

JULY.

13th. A Short-eared Owl was caught alive at Framingham Pigot, near Norwich, and was afterwards sent me by Mr. S. Bligh. From its rich colour and the down between the ear-tufts it was apparently a young bird.

18th. A Homing Pigeon of my son's, liberated at Lowestoft, flew to Keswick in fifty minutes; a good record.

19th. A Curlew at Keswick.

31st. Seven Grey Crows were seen at Yarmouth by Mr. Patterson. They are not often met with at this time of the year.

AUGUST.

2nd. Two Wood Sandpipers seen at Hickling (Bird).

20th. Two Wigeon seen at Hickling (Bird).

22nd. A Garganey was shot near Lynn by Mr. Cresswell.

25th. A pale variety of the Redshank was shot at Cley by Mr. Gunn, who also saw a very pale-coloured Curlew, at first reported to be a white one; and later on a white Woodcock was seen by the keepers at Horsford.

SEPTEMBER.

10th. An immature female Barred Warbler, *Sylvia nisoria*, was shot at Cley by Mr. W. H. Connop. It had the under tail coverts a good deal barred, and the wing coverts edged a little with white. Six years ago one of these birds was shot, on the same date, at the same place; and on this occasion one had been shot only seven days before, in Yorkshire.

18th. A female Alpine Ring Ouzel was shot on the beach at Cley by Mr. T. E. Gunn, answering to the description of *Turdus alpestris* in Dresser's 'Birds of Europe,' where there are four figures given of this southern variety (vol. ii. p. 113; supp. p. 653).

21st. Mr. Patterson noticed and for some time watched a

bird which from his description must have been an Alpine Accentor, near Yarmouth.

25th. Mr. Patterson found floating upon the river Bure a three-bushel sack which proved to be *crammed full of dead Black-headed Gulls, in fact nearly 100 of them*, and most of them minus their wings. Many a visitor to our "Broads" is deprived of pleasure by such thoughtless and selfish destruction as this.

27th. The first Lapland Bunting was seen at Yarmouth (G. Smith), four days later than the first seen last year.

28th. A Fulmar Petrel at Cley (Pashley).

OCTOBER.

1st. A Kentish Plover at Yarmouth (Patterson), and a Yellow-browed Warbler at Cley. The latter was shot by a labouring man who only wished to empty his gun, and little thought he was firing at the first Norfolk example of *Phylloscopus superciliosus*. It has the stripe on the crown very faint, and is probably a young bird. Three were shot on the 8th, 13th, and 15th, in South Yorkshire, probably a part of the same migratory flock, which indeed reached to Italy, where, as I learn from the Rev. H. A. Macpherson, one was killed between Nice and Genoa about the third week in October. The head stripe is scarcely perceptible in one of the Beverley trio, which, through the intervention of Mr. F. Boyes, I obtained from Mr. George Swailes. Eleven examples of the Yellow-browed Warbler have now been met with in the British Isles, two of which have not been recorded, though obtained twenty-seven years ago. These were shot by Mr. J. H. Jenkinson and Mr. Pechell on the Scilly Islands, October, 1867, the same month which produced one at Cheltenham, and were thought to be only young Firecrests (*cf.* 'Birds of Cornwall,' p. 249). One of Mr. Swaile's birds was exhibited by Mr. Harting to the British Ornithologists' Club, and he has commented on this, and on its recent occurrence in Norfolk (Zool. 1894, p. 459). With the Yellow-browed Warbler the Norfolk register is brought up to 298, to which Dr. Sharpe now tells us we may add Holbüll's Redpoll ('British Birds,' i. p. 47). Three days afterwards another bird, nearly as rare, namely, a young Red-breasted Flycatcher, *Muscicapa parva*, was shot at Cley by Mr. G. E. Power. Perhaps the next novelty to be found at this favoured seaside spot will be the Crested Titmouse. No Blue-

throats were seen there, and, so far as I know, none were announced on any part of the east coast of England during 1894.

9th. A young male White-eyed Duck, *Fuligula nyroca*, was shot at Yarmouth (G. Smith).

13th. Received a pair of Gadwalls from a mere in West Norfolk, and later on another pair, but I find these Ducks shy, and much more difficult to keep alive than Pintails. In Hunt's time (1815), the Gadwall was called "a Rodge," probably signifying an eater of aquatic roots (*cf.* Harting, Zool. 1882, p. 296).

15th. A Great Snipe was shot at Reedham (G. Smith), and a Little Gull at Cley (Pashley); two other Little Gulls were seen at Cley, and a Shag killed (G. E. Power).

16th. Lapland Bunting at Cley (Power). Others seen afterwards by Mr. W. H. Dobie.

17th. Little Auk at Cley (Power).

19th. Fulmar Petrel washed up at Yarmouth (Patterson), and another about the same time at Cley (W. H. Dobie).

On the 24th I noticed the barometer very low, and the 25th was as cold a day as I ever experienced, when standing shivering outside a covert; in spite of which, Mr. Pashley informs me, a dull-plumaged female Roller was shot, either on this day or a few days before, at Barton; but the Roller, though tropical in appearance, has a high northern range. A walk with my gun convinced me that birds were on the move. Mr. Patterson, from his station at Yarmouth, observed Rooks, Jackdaws, and Starlings flying south in continuous flocks; and a Sea Eagle was seen by several people at Northrepps, mobbed by about forty Rooks, which gradually drove it out to sea. Two large flocks of Long-tailed Ducks were viewed at sea by Mr. Dobie swimming westwards; and a Black-bellied Dipper, *Cinclus melanogaster*, a bird which the late Mr. Stevenson associated with severe weather, was shot at the back of Aylsham watermill, as I learn from Mr. Southwell, who adds that its gizzard contained elytra of the Whirleygig Beetle (*Gyrinus*). It was afterwards presented to the museum, when I had an opportunity of noting that the whole of the white breast was suffused with specks of brown, doubtless the last indication of immaturity. There was not a tint of chestnut on the under parts. This interesting species is now reckoned almost an annual visitant to Norfolk, whereas the typical British *C. aquaticus* has occurred but twice in the county.

27th. Redwings and Fieldfares were observed coming in flocks straight over the sea (Dobie).

NOVEMBER.

5th. A Fulmar Petrel at Yarmouth (G. Smith).

19th. A Peregrine seen near Wells (Col. Feilden).

20th. A Spotted Redshank was shot at Barton.

26th. A Black Redstart at Cley (Ramm).

28th. A Green Sandpiper, *Totanus ochropus*, at Surlingham.

29th. Two Slavonian Grebes shot on the Bure (G. Smith).

DECEMBER.

4th. A Sea Eagle was killed at Shottesham (J. A. Cole), possibly the same which had been seen at Northrepps and afterwards at Hemsby.

11th. A Richard's Pipit was caught at Caistor, as I am informed by Mr. G. Smith, at whose house it was at the time of writing, thriving on mealworms. It, however, soon died, and was presented by Lord Lilford to the Norwich Museum.

14th. A male Salmon 36 in. long and weighing $13\frac{1}{2}$ lbs. was taken in an eel-trap at Keswick mill, where no one ever recollected a fish of this species having been seen before; indeed, its appearance in any Norfolk rivers is very rare, and this one must have passed through three mills—Trowse, Lakenham, and Keswick—which seems extraordinary.

On bringing these Norfolk Notes to a conclusion, I should like to make an apology. If I was the person who gave Mr. Howard Saunders the information that as recently as 1840 there were Guillemots on Cromer cliffs (*vide* Yarrell, *Brit. Birds*, iv. p. 70), though my name is not mentioned, I can only say that I am sorry I was so incautious. There is no reason for supposing that Guillemots ever bred at Cromer, and assuredly not so lately as 1840. The cliffs, as Mr. Southwell has pointed out, are too friable and sandy, with hard clay in places, but quite devoid of rocky ledges such as Guillemots love to haunt. The excuse for the mistake lies in the misapprehension of the meaning of the name "Foulness," applied in maps to this headland of our coast. In the opinion of Mr. W. Rye, the well-known antiquary, it does not mean "Birds' headland," as I incorrectly supposed, but a foul or dangerous place where good ships may come to grief.

NOTES AND QUERIES.

MAMMALIA.

The Lesser Shrew.—The Lesser Shrew, *Sorex minutus*, is perhaps the least known of the smaller British quadrupeds. Its wide distribution throughout the British Isles was known to Bell; and Mr. de Winton informs me that he has specimens from England, Scotland, Ireland, and the Hebrides. Dr. Shaiff, of Dublin, tells me that *S. minutus* is common in Ireland, while *araneus* is entirely absent. This is an interesting fact, and the perusal of a very interesting paper by him on “The Origin of the Irish Land and Freshwater Fauna,” leads one to infer that *Sorex minutus* was an earlier inhabitant of Britain than *araneus*, and penetrated into Ireland before the severance of that island from Britain, and before *araneus* had arrived here. The comparative scarcity of *minutus* in Britain is also interesting in this connection. Did the larger *araneus* come over and wage war with its smaller relative, and so diminish its numbers in the same way that *Mus decumanus* has done with *Mus rattus*? So far as my limited experience goes, both Shrews make use of the same runs.—LIONEL E. ADAMS (Northampton).

Yellow-tailed Squirrels.—I understand that some investigations on the subject of Squirrels’ tails becoming yellow or straw-coloured are on foot. Perhaps it may interest those curious in the matter to hear that early in January of this year I observed six Squirrels busily engaged hunting for beech-mast under some beeches near my windows, and that *four* of them had tails of a more or less yellow hue, the other two being of the ordinary colour. Later on in the spring the tails of most if not all our Squirrels here become yellow or yellowish white.—O. P. CAMBRIDGE (Bloxworth Rectory, Dorset).

The Editor having shown me this letter of Mr. Cambridge, I may state that, thanks to the kindness of Mr. J. C. Mansel-Pleydell, the British Museum has received a fine series of Squirrels, killed at intervals of a few weeks all through the year, from Whatcombe, near Blandford, Dorset, the same district from which Mr. Cambridge writes. These clearly show that about November the tail grows a new and rich coat of brown or even nearly black hairs, and that these begin to bleach almost at once, passing through all the shades of colour from dark brown, by dull brown, yellowish brown, yellow to yellowish white, or even clear white, so that August and September specimens have normally white tails. But as the bleaching of the hairs goes on most irregularly in different individuals, the four out of six January specimens mentioned by Mr. Cambridge with tails of a “more or less yellow hue” are perfectly natural and in accordance with what is shown by Mr. Mansel-Pleydell’s series. Any specimens presenting a condition

inconsistent with the rule, such as white-tailed individuals killed in November or December, or dark brown or black-tailed ones procured in August, or, again, *any* red-tailed ones, would be acceptable additions to the series in the British Museum. This series, it is hoped, will be worked out shortly, not only as regards the variation in the colour of the tails, but also as to the growth and colour-change in the fur generally, and as to the development, bleaching, and shedding of the ear-tufts. — OLDFIELD THOMAS (Natural History Museum).

The Names of the Mole.—With reference to Mr. H. Raeburn's note, on p. 64, on this subject, it would be interesting to learn in what part (or parts) of Denmark the name *Marsvin* is applied to this animal, as it usually means a Porpoise; though I see by both the Dano-Norwegian and Swedish dictionaries that it is also used for a Guinea-pig. Again, is it certain that the first syllable is derived from the word signifying Elf or "Nightmare"? is it not rather from the word which is, I believe, both Old Norse and modern Icelandic, meaning sea? Compare the French *Marsuin*, which Rolland ('Faune populaire de la France') derives from Old High German *Mérisuin*; modern German *Meerschwein*; Russian *Morskaja swinja* (pronounce *j* as English *y*), all meaning Sea-pig; while the same idea appears in the Spanish *Puerco marino*. The Mole does not occur in Norway, nor (according to Lilljeborg, 'Sveriges och Norges Ryggradsdjur') further north in Sweden than Södermanland. The Danish name for a Mole is *Muldvarp*; *Muldvarpe*, as quoted by Mr. Raeburn, is the plural. The Swedish word is *Mullvad*, which agrees as to its last syllable with the Scotch form; and it should be remembered that the Swedish language, as now used, is much nearer Old Norse than the Dano-Norwegian.—ALFRED HENEAGE COCKS (Great Marlow, Bucks).

Irish Hare turning White in Winter.—At p. 266 of 'Science Gossip' for February last, in Dr. Scharff's interesting sketch of the fauna and flora of Ireland, it is stated that "in Ireland the Arctic or Mountain Hare does not change its dress to white as it does in cold countries, but remains in its brown summer hue throughout the winter." I do not know on what grounds Dr. Schaiff has been led to make this statement, for, so far as my experience goes in County Down, it is quite incorrect. At Finnebrogue, near Downpatrick, a very large number of Hares are taken or killed every year, and it is found that a considerable number of these turn very white in the winter, while nearly all assume a much lighter shade of fur when the cold weather sets in. The Irish Hare is considered to be exceptionally strong and suited for coursing purposes, and a large number are exported annually to England and Scotland for various coursing meetings. — W. E. WARRAND, Major-General R. E. (Harold Road, Margate).

[In the recently published volume by Mr. Lydekker on 'British Mammalia,' in Allen's Naturalists' Library, the same mistake is made. It

is there stated (pp. 226, 227) that "in Ireland, doubtless owing to the mild climate, the Mountain Hare does not turn white in winter." This error was doubtless copied from Bell's 'British Quadrupeds,' notwithstanding that we pointed out the fallacy of it twenty years ago, on the appearance of the second edition of that work. Since then we have not only received the assurance of several sportsmen and good observers in Ireland that Bell was mistaken in his assertion, but we have had ocular demonstration of the fact by shooting several Irish Hares, and seeing others shot by friends, in all stages of change from brown to white.—ED.]

The Black Rat in London.—As the occurrence of the old English Black Rat, *Mus rattus*, is becoming less frequent every year, it may be of interest to note that a young one, a female, was caught on the business premises of Messrs. S. E. Norris and Co., at Shadwell, East London, in February last. During the same week that this specimen was trapped, several Brown Rats, *Mus decumanus*, were caught in the same part of the building.—A. D. LAPSWORTH (Woodford Green).

CETACEA.

Food of the Dolphin.—In Sept. 1893, the men on board the Prince of Monaco's yacht lying off Corsica captured a Dolphin, which on being hauled on board was opened and the contents of the stomach immediately placed in alcohol. Subsequent examination by Prof. L. Joubin, of Rennes, showed that at the time of its capture this Dolphin had just made a large meal of cephalopods. Many of them were so little injured that there was no difficulty in determining the species, and the following were recognised:—*Enoploteuthis margaritifera*, Rüppell (four specimens), *Chiroteuthis veranyi*, d'Orbigny (three specimens), *Loligo vulgaris*, Lamarck, *Todarodes sagittatus*, Steenstrup, *Onychoteuthis lichtensteini*, Férussac, *Heteroteuthis dispar*, Gray (?), and three examples of a new species which Prof. Joubin has described and figured (Bull. Soc. Zool. France, tome xix. 1894, p. 64) under the name of *Ctenopteryx cyprinoides*, and which appears to be allied to *Ctenopteryx fimbriatus*, described by the Norwegian zoologist Appelöf. The particular species of Dolphin is not mentioned, but we may assume from the name *Dauphin* applied to it that it was the common *Delphinus delphis*, Linn., which is not only plentiful in the Mediterranean, but comes into our own waters. On the Cornish coast especially it sometimes appears in considerable numbers, and is frequently taken in the fishermen's nets. An examination of some of these, according to Couch, has proved that the food of this cetacean is not confined to cuttle-fish and crustacea, but that Pilchards, Mackerel, and other fish are also habitually taken.—J. E. HARTING.

BIRDS.

Local Names of Wildfowl.—Can any correspondent say what are the modern names of the wildfowl formerly termed *pellstarts* and *smeathes*? I have lately been writing the history of Cheadle, in Cheshire, and in the diary of Sir Wm. Brereton, the Parliamentary General, there are particulars given of his 'coy (or decoy) at Handford Hall, his home, and the "shovelars, teal, wigeon, *pellstarts*, and *smeathes*" that were taken there. The names probably refer to Pintails and Smews; but would they ever be common birds inland in Cheshire? Handford or Handforth Hall is ten miles south of Manchester, a beautiful old black and white house, with good staircase, and a wonderfully inscribed porch of black oak dated 1562, erected by Wigan Brereton, who married the heiress of the last of the Handfords (who fell at Flodden), and who had been married and divorced from Sir John Stanley, who also fought at Flodden. The site of the "decoy" is now a reservoir for a calico-printing works, and ducks are accordingly scarce.—FLETCHER Moss (The Old Parsonage, Didsbury).

[The word *pell*, diminutive of *pool*, means a broad shallow piece of water, larger than a pond and smaller than a lake, A. S. *pól*, British *pwl*. In Dutch it is *poel*, in German *pfahl*, Latin *palus*. *Pell* is in use in Sussex, and signifies just such a place as wildfowl love to haunt. In Herefordshire a *pill* is a small creek, which in Wales is called *pil*. This word is used on the Severn, but occurs elsewhere in Celtic districts as a proper name. For example, in Cornwall, on the Falmouth river, there is a village named *Pill*. In Ireland also there is *Pilltown* in Co. Kilkenny, situate on a creek of the Suir called the *Pill*, and *Pilltown* on the Blackwater, Co. Waterford. But however suggestive this may be of wildfowl and their haunts, can this word after all have anything to do with *pell* in *pellstart*? *Start*, of course, is the A. S. *steort*, tail, seen in "Redstart," and "Clubster," a local name for the Stoat; but *pellstart*, if from A. S. *pól steort*, can have no intelligible signification. It is more likely that the word is a corruption of "pilestart," *pil* signifying an arrow, dart, or javelin. In this sense it would be applicable enough to the Pintail, *Dafila acuta*. It would be interesting to know whether *pellstart* or *pilestart* is still in use in any part of the country. We have not found it in any of the Glossaries, ten or a dozen, to which we have referred. *Smeath*, on the other hand, is given in several for the Smew, *Mergus albellus*, which, from its piscivorous habits, is not at all likely to be decoyed, though it might be taken in a decoy by accident.—ED.]

Notes on Grouse.—I have to thank Mr. Macpherson for his "explanation," though it hardly seems to explain much. As I never saw my uncle's bird described in print as a hybrid until I read the allusion to it in the volume on the Grouse in Longman's "Fur and Feather" Series, I can hardly have concurred in any "original records." I am informed by

Mr. Suchetet, of Rouen, that he knows of ten or eleven more or less authenticated cases of hybridism between the Red Grouse and Black-game (but this is not one of them), one an undoubted example, bred in captivity. As to the migrations of the Red Grouse, if Mr. Macpherson has been "often asked to investigate" such phenomena, but has not done so, by what process did he arrive at the opinion which he has expressed in the volume on 'The Grouse,' that this bird does not migrate at all? Almost every one in Alston knows of the regular appearance of the "Yorkshire birds," as most people know of the arrival of the Swallows. And if Mr. Macpherson would either pass a few days in Alston twice or thrice during the season, and examine the birds sent in to the dealers, or would go up with the owners or lessees of a few of the moors about there twice or thrice in the season, and examine and weigh the birds killed at different periods, he would certainly be in a position to give us some exact information of the highest interest, without having recourse to tin labels, to which there is likely to be considerable objection. I am tempted to add a brief account of the movements of the birds on my uncle's moor at Alston. There are two types of birds which breed there. The low-ground cocks are a little over average size, and weigh about 26 oz.; are very red-coloured, with but little black ground colour on the under parts, and that chiefly confined to the lower belly; have hardly any white tips; the white moustache hardly visible. The hens are very handsome, dark, boldly marked, with large golden spots (tips) on the back; weight about 23 oz. On higher ground the larger "fell-top birds" are met with, weighing (cocks) 28-30 oz.; much blacker in ground colour, and with a great deal of white on the throat, wings, and under parts generally; the hens about 24 oz., dark, and a good deal ticked with white. In the earlier part of the season these are the two types met with, the former on the low ground, the latter on the hill-tops and rockier ground. But after the end of October—or a little later according to the season—the first or low-ground type seems to vanish mostly, probably to fells lower down (but as to this I know nothing for certain), while the fell-top birds descend to take their place. In addition a very large number of smaller Grouse appear, in big packs, all, or nearly all, females. I cannot say that I have ever handled a male. These are well known in the neighbourhood as "Yorkshire birds," and are believed to come from the Duke of Cleveland's Yorkshire moors, some twenty miles off. They are much lighter in colour than the native hens, so much so that they are readily recognised on the wing. They are very yellow in tint, very "speckly"—that is, the markings are, by comparison, much less bold, and the contrast of colours much less striking than in the other two types. The two which I have as skins weighed, when freshly shot, 19 oz. and 20½ oz. respectively. I should say that the former, or a trifle more, is about the average weight—that is to say, some three ounces

less than the hens scale which are shot earlier in the season, a very substantial difference. These last stay till towards the pairing season, and then are seen no more till late autumn. Apart from the weights, which speak for themselves, the three types are distinguishable at a glance by their plumage.—HENRY H. SLATER.

Migration of Grouse in Winter.—In our last number (p. 69) we printed the reports of several correspondents, showing the severe straits to which the Red Grouse have been reduced upon the north country moors by reason of the severe cold and heavy snow, which have prevented them from getting their usual food, and driven them down to the valleys in search of sustenance. A correspondent of 'The Field,' writing from North Yorkshire on Feb. 12th, observes:—"In the North Riding the storm continues with unabated severity, and both winged and ground game are suffering. On the moor the snow lies very deep, many of the smaller 'ghylls' being completely overblown. The Grouse have forsaken the higher moors, where it is impossible for them to be artificially fed, and have congregated on the lower ground, where, by means of snow harrows, and holes dug through the snow, they are enabled to reach the heather. On most moors, where practicable, they have been and are daily fed with unthrashed corn. Numbers of Grouse, however, are scattered all over the lower valleys, and may be seen literally in hundreds perched in the hedgerows, feeding on the hawthorn berries and haws of the brier, and other wild seeds. It is a pitiable sight to see the straits to which these—our gamest of game-birds—are reduced; they are so tamed by want of food as to be heedless of the approach of man, and could easily be knocked down with a stick. Scores have succumbed, but in many cases these have been 'pricked' birds, and in some instances birds suffering from tapeworm. All the weakly birds must be killed by the intense cold and lack of food, and numbers will doubtless fall victims to unscrupulous persons. The partial thaw, succeeded by a severe frost, rendered it impossible for the birds to get through the frozen surface to reach their natural food, and this frost was followed by another thick covering of snow. Undoubtedly, good will ensue to a limited extent by the change of blood, and on the overstocked moors disease may be averted. Not within the memory of man have so many Grouse been seen feeding in hedgerows or amongst the sheep and in farmyards as at present. Partridges also have suffered, and whole coveys have been found frozen stiff where jugging. In most cases Partridges are able to eke out a subsistence by feeding in the hedge bottoms, roads, and farm or stackyards, but the bitter cold of the present storm has caused great destruction. Rooks and Carrion Crows have been seen feeding on emaciated, starved birds and rabbits. Pheasants are, as a rule, well looked after and hand-fed, but in distant and unpreserved coverts the wild birds are being exterminated. Foxes are plentiful, and their pad-marks can be seen in all directions in the

snow, and doubtless they also have proved destructive to game. Snipe have apparently deserted us, and comparatively few wildfowl have been seen inland. Hares and rabbits are perishing in scores, dead bodies, frozen stiff, being frequently seen. In the hedgerows and plantations most of the lower branches and stems of the trees have been peeled by the rabbits, which seem especially partial to holly, ash, and hazel, the black-thorn escaping to a great extent. The hill farmers are put to great straits for want of hay, and the difficulty of transporting it, many of the roads being snow-blocked."

Brünnich's Guillemot in Cambridgeshire.—With reference to the Guillemot alluded to in your editorial note (p. 70) as announced by the Rev. Julian Tuck, I beg to inform you that this gentleman has been kind enough to send me the specimen in question, stuffed, for inspection. I had little doubt at first sight as to its species, but as I have a very slight acquaintance with this family of birds, I obtained Mr. Tuck's permission to send his bird for the opinion of Professor Alfred Newton, who, after comparing it with specimens in the Cambridge University Museum, wrote to me that (in his opinion) there could be no doubt that the bird is Brünnich's Guillemot. I may add that through the courtesy of Mr. W. J. Clarke and Mr. Oxley Grabham, I have also seen the Scarborough and Filey specimens, recorded *loc. supra cit.* and that an examination of these confirms (were any confirmation needed) Professor Newton's opinion with regard to the subject of this note.—LILFORD (Lilford Hall, Oundle).

[It is satisfactory to have all doubt removed by this communication, for which we are much obliged, and it only remains to add that the Cambridgeshire specimen of Brünnich's Guillemot here referred to was obtained at Guyhirne, on the Nene, Cambridgeshire, about the 12th January last. It was received in the flesh by Mr. Travis, taxidermist, of Bury, from whom it was subsequently purchased by Mr. Tuck.—ED.]

Sea Gulls in London.—During the continuance of the severe frost in January and February hundreds of Sea Gulls frequented the Thames in the very heart of London, attracted apparently by the open water which was kept from freezing by the tide. Here they remained for many weeks, hovering round the bridges, from which the bystanders threw them pieces of bread, biscuit, and other food, or resting on the moored barges and blocks of floating ice. At Blackfriars Bridge they were especially numerous, and between that and Westminster Bridge they were daily to be seen in hundreds. From Westminster some of them made daily excursions to the water in St. James's Park, where they would alight to share the food thrown to the Ducks and semi-domesticated pinioned Gulls, which perhaps served as decoys. Amongst the flocks which visited the metropolis, by far the greater number were Black-headed Gulls in the ordinary winter plumage,

that is without black heads, and many of them immature, as might be seen by their mottled backs and the broad dark bar across the extremity of the tail. But in addition to these were many Kittiwakes, a few Common Gulls, Herring Gulls, and now and then an immature Black-backed Gull. On one occasion (Feb. 15th) I had a close view of a Little Gull, *Larus minutus*, as it passed along the Thames Embankment at Charing Cross, within a yard or two of where I stood feeding some of the Black-headed species. Londoners are accustomed to see a few Gulls on the river from time to time, as well as on the water in the parks during the period of migration in spring and autumn, but the unusual numbers of these birds which made their appearance in the middle of January was so extraordinary as to attract universal attention.—J. E. HARTING.

Hybrid Finches at the Crystal Palace Bird Show.—The most interesting hybrid exhibited at the late Crystal Palace Bird Show was a cross between the Greenfinch and Bullfinch—a large handsome bird with a greyish back and dull reddish yellow breast and upper tail coverts. In the same class was a Siskin and Redpoll hybrid, and several examples of the commoner crosses between the Goldfinch and Linnet and the Bullfinch and Goldfinch; one variety with a white head, which was undescribed in the catalogue, was evidently an example of the latter. Altogether eleven birds were exhibited in this class, exclusive of a Reed Bunting, which for some unknown reason was allowed a place in it. Two very nice Redstarts and some beautiful Bearded Tits were on view, and the variety class included a Goldfinch with a black instead of a crimson face.—A. HOLTE MACPHERSON.

Two-barred Crossbill in the West of England and Ireland.—A letter from Mr. Maxwell, of Keynsham, Somerset, announces the fact of his having shot a red Crossbill with two white bars across the wing, one of a little flock that visited a wood in his neighbourhood during the last week of February. Another is reported from the Co. Fermanagh, by Mr. Charles Langham, of Tempo Manor, Enniskillen, who writes on Feb. 23rd:—"I have had a stroke of luck since I last wrote to you. Wishing to obtain some Crossbills for my collection, I shot a few, one of which is *Loxia bifasciata*. My bird-stuffer, who has had over sixty years' experience, is positive that it is the European Two-barred Crossbill, and not the American white-winged species." We have no reason to doubt the correctness of the identification, and those of our correspondents who are being visited by Crossbills this winter would do well to keep a look-out for the rarer two-barred species that may be in their company.—ED.

Shearwaters in Carnarvonshire.—It is not at all unlikely that the dead Shearwaters found in Carnarvonshire by Mr. T. A. Coward (p. 72) may have been dashed by the force of the wind against the cliffs, on misty nights, and killed. When at the Scilly Islands, I found a good many of

these birds which had evidently met their death in this way, and I think most of them had broken necks like those found by Mr. Coward.—J. H. GURNEY (Keswick, Norwich).

Stone Curlew in Lincolnshire in Winter.—A specimen of the Stone Curlew (*Edicnemus*) was shot by a labourer in the parish of Marsh Chapel, on the 30th January last. It was in good condition, in spite of the extreme severity of the weather.—G. H. CATON HAIGH (Grainsby Hall, Great Grimsby, Lincolnshire).

Waxwing in Leicestershire.—A specimen of this bird was shot near the village of Laughton, in this county, on Feb. 13th. I did not hear of its occurrence before the bird had been sent for preservation to a bird-stuffer in Leicester, and am therefore unable to state any particulars as to its sex, or food.—A. MATTHEWS (Gumley, Market Harborough).

Blackbird marked like Ring Ouzel.—In 'The Zoologist' for 1893, p. 189, is a notice of an old male Blackbird marked with a well-defined crescent-shaped patch at the upper part of the breast near the throat. I have seen this bird constantly here ever since, until the beginning of the present year 1895, and the pale marking had increased in distinctness. I fear that some mischance has happened to this bird, as it has not been visible among the numerous birds of many kinds coming daily to be fed on my lawn during the long severe past frost; there is, however, in its place, a hen Blackbird marked exactly in the same way. She has been about here since last summer.—O. P. CAMBRIDGE (Bloxworth Rectory, Dorset).

Gray-lag Geese breeding in Nottinghamshire.—The Grey-lag Geese, *Anser ferus*, come to our shooting-quarters in Norway on or about April 1st, and generally speaking have laid and are sitting by May 1st. The eggs from which my geese at Annesley were reared were taken during the last week in April, 1889, and I myself set them under hens. They took twenty-eight days hatching, and the young were very easily reared. In March, 1894, they all took their departure, and when I returned from Scotland I discovered two of them sitting on the island in the pond, about half-a-mile away. They each in due time hatched four young ones, and they are all now well and strong. I have never got them to cross with the tame geese, although they are always together. I have seen them crossed in Scotland, but mine never do so, although they have every opportunity, as for some years I had a wild gander alone with tame geese, and I also had a wild goose for several years alone with my tame geese. I consider that the Scotch wild Gray-lag differs somewhat from the Norwegian bird, though not to any great extent. Two facts strike me as curious, namely, that they laid their eggs and were sitting a month earlier than they would have done

in Norway, and also that one gander paired with two geese, which is quite opposed to what happens in a wild state, for they then pair and the gander keeps with the goose the whole time she is sitting, and guards the brood until they all take their departure at the end of September. Another fact I should like to mention, and that is, Grey-lag Geese do not lay the number of eggs that is commonly supposed. Six is the largest number that I have ever seen; four and five the usual number. I have heard of seven, but have never seen so many, and I have had considerable experience in this respect.—P. MUSTERS (Annesley Park, Notts).

REPTILIA.

On the Habits of *Macropisthodon rhodomelas*.—The little harmless *Macropisthodon rhodomelas*, Boulenger, is one of the commonest Snakes in Singapore, and may often be seen creeping about in the grass in the Botanic Gardens, in the early morning and evening. It is very conspicuous with its brick-red head and body and slaty-blue belly. On the nape is a black V-shaped mark, edged with blue, and a black line runs down the back. When attacked, and unable to escape, it sits up like a Cobra, spreading out the skin on either side of its neck, and arching forwards its head. This imitation of a Cobra might of itself deter enemies from approaching it, but the reptile has a further protection, which I think has not been hitherto recorded. When sitting up, Cobra-wise, it exudes from a point on its neck just above the black mark, a number of drops of a thick white liquid, in the position of the skull-like markings of the Cobra. A Terrier attacking this Snake naturally bit and shook it by the most prominent portion, namely, the arched neck; and though he killed it, the glandular exudation made him foam at the mouth for a considerable time, and he was evidently very uncomfortable. The action on the mucous membrane of the mouth was exactly like that produced by the acrid secretion of a common Toad here, *Bufo melanostictus*, which no dog will touch twice. I captured one of these Snakes and tasted the milky exudation, but though it was bitter and unpleasant, it did not produce the action on my salivary glands that it does on those of the dog. I do not remember to have heard of any other Snake which repels its enemies by its distastefulness; and the boldness with which this Snake moves about in open, exposed spots, is probably due to the possession of this form of defence. I should add, that as all the Cobras in the south of the Malay Peninsula are entirely black, and the only other hooded Snake, *Ophiophagus*, does not much resemble *Macropisthodon* in colouring, so that though the latter may be taken for a poisonous hooded Snake under some circumstances, the resemblance is probably hardly sufficiently close to deceive the sharp-eyed Serpent-Eagles which are always on the watch for prey.—H. N. RIDLEY (Singapore).

SCIENTIFIC SOCIETIES.

LINNEAN SOCIETY OF LONDON.

Feb. 7th.—Mr. C. B. CLARKE, F.R.S., President, in the chair.

Messrs. G. H. Adcock and J. R. Bovell were elected Fellows.

Mr. Thomas Christy exhibited a dried specimen of *Aplopappus Llarete*, and samples of the so-called Gum Kino, *Pterocarpus erinaceus*, of which some account was given by Mr. E. M. Holmes.

Mr. George Murray exhibited a number of lantern-slides of floating Algæ, of which he gave brief descriptions, referring to the localities in which they had been found, and the literature relating to them.

By permission of the Director of the Royal Gardens, Kew, Mr. W. B. Hemsley exhibited dried specimens of a number of new plants from Eastern Asia.

Mr. Thomas Hanbury exhibited a beautiful collection of fresh fruits of the *Aurantiacea*, grown in his own garden at La Mortola, Mentone, and gave an account of some of the more remarkable varieties, their mode of growth, and the conditions under which they had been grown.

A paper was then read by Mr. H. M. Bernard "On the Comparative Morphology of the *Galeodidæ*." Having described a possible origin for the Crustacea from a chætopod annelid by an adaptation of the anterior segments to a method of feeding, whereby the parapodia could function as jaws, the author attempted the same for the Arachnida, with a view to solve the question of their relationship with the Merostomata. The *Galeodidæ* were chosen for special study because, unlike other Arachnids, they have retained some segments of the cephalothorax as free movable segments, and hence might be expected to throw light on the subject. The author believed that he had solved the question of the primitive specialization of the Arachnid phylum from their annelidan ancestors, and expressed the opinion that as Arthropods they are not related either to the Crustacea (including *Limulus*) or to the Hexapoda; but that all these are distinct derivations of the Annelidæ. In an interesting discussion which followed, the paper was criticised at some length by Mr. A. D. Michael, Prof. Howes, and Mr. R. I. Pocock.

Feb. 21st.—Mr. C. B. CLARKE, F.R.S., President, in the chair.

Mr. Robert Okell was admitted a Fellow.

Mr. J. H. Vanstone exhibited specimens of some nearly allied Hydrozoa, namely, *Bougainvillea ramosa* and *B. musca*, and after demonstrating their structure, gave reasons for concluding that although the latter had been described as distinct by Prof. Allman, the characters relied upon were not of specific value, but simply varietal.

Mr. George Brebner exhibited some lantern-slides of *Gloeosiphonia capillaris* and other Algæ, with accompanying descriptions, and gave an interesting account of his method of preparing slides in colours.

On behalf of Mr. J. Boerlage, the President demonstrated the chief points in a paper communicated by him on the identification of *Chionanthus Ghaeri*, an obscure species figured by Gaertner at the end of the last century, in his famous work 'De Fructibus et Seminibus Plantarum,' but hitherto undetermined. From the researches of Mr. Boerlage it now appeared that it was evidently referable to *Scirpodendron costatum*, Kurz. This was made clear by the excellent drawings which accompanied the paper as well as by the specimens which were exhibited.

A paper was then read by Mr. E. M. Holmes on new marine Algæ from Japan. The author pointed out that up to the present time the known species of Algæ from that country did not exceed 300, or about half the number found in Great Britain; but that the districts around three centres only had been explored, namely, Hakodadi, Tokio, and Nagasaki, notwithstanding the fact that sea-weeds are largely used as food by the Japanese, and form an important article of commerce. The paper included descriptions of twenty-three new species, the structure of which was shown by means of the oxyhydrogen lantern.

ZOOLOGICAL SOCIETY OF LONDON.

Feb. 5th.—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 January, 1895.

Mr. Holding exhibited and made remarks on the skull of a Three-horned Stag, the head of a Four-horned Ram, and the gnawed horn of a Red Deer.

A communication was read from Dr. E. A. Goeldi, in which he described the breeding habits of some Tree-Frogs observed by him in the Province Rio Janeiro:—*Hyla faber*, Wied, constructs nests of mud on the shallow borders of ponds, wherein the young are protected from enemies whilst in the larval state. *Hyla goeldii*, Boulenger, dispenses with the metamorphoses, which are hurried through within the eggs, these being carried by the female on her back. *Hyla nebulosa*, Spix, deposits its eggs in a slimy mass attached to withered banana-leaves, the young remaining in this sort of nest until in the perfect, air-breathing condition.

Mr. Edgar A. Smith gave an account of a collection of Land-Shells made principally by Mr. A. Everett at Sarawak, British North Borneo, Palawan, and other neighbouring islands.

Mr. Oldfield Thomas read a paper upon the long-lost mammal, *Putorius africanus*, Desm., and its occurrence in Malta,

Mr. F. E. Beddard read a paper on the visceral anatomy of the Tree-Kangaroo, *Dendrolagus bennettii*, and pointed out the structure of the brain and other organs.

Feb. 19th.—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.

Mr. F. E. Beddard read a paper in which he gave a description of the brain of the Glutton, *Gulo luscus*. A second paper by Mr. Beddard contained a description of the brain of different species of Lemurs that have died in the Society's Gardens, pointing out the range of variation to be observed in the cerebral convolutions of this order.

A communication was read from Mr. C. Davies Sherborn and Dr. F. A. Jentink, in which were given the dates of the publication of the parts of Siebold's 'Fauna Japonica' and Giebel's 'Allgemeine Zoologie' (first ed.).

A communication was read, from Dr. J. de Bedriaga, "On the Pyrenean Newt, *Molge aspera*, Dugès," dealing with the external, osteological, and larval characters of this imperfectly-known Batrachian, and giving an account of its habits.—P. L. SCLATER, *Secretary*.

ENTOMOLOGICAL SOCIETY OF LONDON.

February 6th, 1895.—Professor RAPHAEL MELDOLA, F.R.S., President, in the chair.

The President announced that he had nominated the Right Hon. Lord Walsingham, F.R.S., Mr. Henry John Elwes, F.L.S., and Prof. Edward B. Poulton, F.R.S., Vice-Presidents of the Society for the Session 1895-96.

Mr. Charles Nicholson was elected a Fellow.

Mr. W. F. H. Blandford made some remarks regarding M. Brongniart's donation to the library of his monograph entitled "Recherches pour servir à l'Histoire des Insectes Fossiles des Temps Primaires." Mr. Blandford also called attention to figures of pupæ of species of *Spalgis* (Lycænidæ) in the 'Journal of the Bombay Natural History Society.'

Canon Fowler exhibited, on behalf of Mr. C. A. Myers, an unusually fine specimen of *Sphæria robertsi*, growing from the prothorax of an underlarva of an *Hepialus*, supposed to be *H. virescens*, from New Zealand. Mr. McLachlan said that there was a doubt whether the caterpillar should be referred to this species. Mr. Blandford stated that the French Government had set aside a section of the Pasteur Institute at Paris for the study of entomophagous fungi.

Prof. L. C. Miall and Mr. N. Walker communicated a paper "On the life-history of *Pericoma canescens* (Psychodidæ)," with an Appendix by Baron Osten-Sacken.

Herr Jacoby read a paper entitled "Contributions to our knowledge of African Phytophagous Coleoptera." Dr. D. Sharp remarked that Erichsen began the 'Insekten Deutschlands' some sixteen years ago, and as he was engaged on a classification of the Coleoptera of the world, he included a considerable number of these exotic species in his work.

Mr. G. F. Hampson read a paper entitled "Descriptions of new Heterocera from India."—W. W. FOWLER, *Hon. Secretary*.

Feb. 20th.—Professor RAPHAEL MELDOLA, F.R.S., President, in the chair.

Mr. W. M. Christy exhibited specimens of *Lycæna agestis*, caught in Sussex last summer, which had a white edging round the black discoidal spot. He said the specimens might perhaps be identical with the northern form of the species known as the variety *salmacis*.

Mr. H. Goss exhibited a small collection of Lepidoptera from the South of France made by Mr. Frank Bromilow.

Professor Meldola invited discussion upon the address delivered by Mr. Elwes, as retiring President, on the Geographical Distribution of Butterflies, at the last Annual Meeting. He thought that the discussion might lead to a useful expression of opinion if the speakers would deal with the question as to how far the scheme of distribution advocated by Mr. Elwes was borne out by a comparison with other orders of insects. He was of opinion that in considering schemes of geographical distribution the results arrived at were likely to be of greater value the wider the basis on which they rested; and he therefore suggested a consideration of the question how far it was justifiable to draw conclusions from one division or one order only.

Dr. Sharp remarked that geographical distribution consisted of two divisions—firstly, the facts; secondly, the generalisations and deductions to be drawn from them. He thought that, as regards insects generally, our knowledge of the facts was not yet sufficient to warrant many generalisations. Still the impressions of those who have paid attention to particular groups of insects are even now of some importance, though at present based on incomplete knowledge. He thought the Rhopalocera would prove to be a somewhat exceptional group in their distribution. Notwithstanding that Australia and New Zealand are so poor in them, this was by no means the case with their Coleoptera, Australia being very rich, and its fauna of Coleoptera being very distinct. He thought that if Lepidoptera generally were well collected in Australia and New Zealand, it would be found that this order was not so poor in species as was supposed. He instanced the case of the Sandwich Islands, where it was supposed that there were very few species of Lepidoptera, and yet some five hundred species, or perhaps more, had been recently found there by Mr. R. C. L.

Perkins, who had been sent to investigate the islands by a committee appointed by the Royal Society and the British Association.

Mr. McLachlan was of opinion that no definite demarcation of regions existed, but that all the regions overlapped; in any case, the retention of Palæarctic and Næarctic as separate provinces was not warranted on entomological data. He thought that at the close of the glacial period some insects, instead of going north, were dispersed southwards, and that the present geographical distribution of some forms might thus be accounted for. The discussion was continued by Mr. Osbert Salvin, Mr. J. J. Walker, Herr Jacoby, Mr. Champion, Mr. Elwes, and Professor Meldola.

The Rev. T. A. Marshall communicated "A Monograph of British Braconidæ," Part VI.

Mr. J. W. Tutt read a paper entitled "An attempt to correlate the various Systems of Classification of the Lepidoptera recently proposed by various authors."—H. Goss, *Hon. Secretary*.

NOTICES OF NEW BOOKS.

The Life of Richard Owen. By his Grandson, the Rev. RICHARD OWEN, M.A. With the scientific portions revised by C. DAVIES SHERBORN. Also an Essay on Owen's position in Anatomical Science by the Right Hon. T. H. HUXLEY, F.R.S. With Portraits and Illustrations. 2 vols. 8vo. London: John Murray. 1894.

IN 'The Zoologist' for January, 1893, we gave a brief memoir of the distinguished naturalist who had then lately passed away, and whose 'Life' is now before us. In view of this notice there will be no need now either to repeat or amplify the biographical details already given, or to state facts which must be well known to the majority of our readers. Those of them who may take up the two volumes lately published by a grandson of the deceased will be well repaid by their perusal. In them they will find narrated the story of the early life and struggles of a young man aspiring to fame in the medical profession; his trials and troubles, overcome by sheer energy and fixity of purpose, and his gradual ascent of the ladder of fame culminating in his attainment of the highest position as an anatomist and palæontologist. Incidentally we see him at his daily work in the Museum of the Royal College of Surgeons, and

afterwards at the British Museum, and are introduced to his friends and fellow-workers, many of them distinguished men of science. Consulted by royalty and by the government of the day on various questions of reform, such as the supply of water to large towns, the improvement of slaughter-houses and meat-markets, &c., we find him sitting on various commissions and giving valuable and practical advice. The important services which he rendered as a Commissioner of the first International Exhibition in 1851 were duly appreciated by the late Prince Consort, and the public are now beginning to recognise the advantage which has resulted from the removal, which he advocated, of the Natural History collections in the British Museum from Bloomsbury to South Kensington.

The laborious task of cataloguing, in five volumes, the collections of John Hunter, and the large number of scientific memoirs which he published during fifty years of unremitting study and research, have resulted in a bequest to posterity of the most valuable and instructive kind.

By way of appendix to the second volume of this 'Life,' Prof. Huxley has written a very able criticism of Owen's position in the history of anatomical science, and we cannot do better than quote from it a few sentences in which he has given an opinion which no one is better qualified than himself to express. He says:—

“During more than half a century Owen's industry remained unabated; and whether we consider the quantity or the quality of the work done, or the wide range of his labours, I doubt if, in the long annals of anatomy, more is to be placed to the credit of any single worker.”

After enumerating some of his most important memoirs, and showing in what particular respects they contributed to knowledge, he proceeds:—

“It is a splendid record; enough, and more than enough, to justify the high place in the scientific world which Owen so long occupied. If I mistake not, the historian of comparative anatomy and of palæontology will always assign to Owen a place next to, and hardly lower than, that of Cuvier, who was practically the creator of these sciences in their modern shape; and whose works must always remain models of excellence in their kind. It was not uncommon to hear our countryman called 'the British Cuvier,' and so far, in my judgment, the collocation was justified, high as the praise it implies.”

As paving the way for this expression of opinion, Prof. Huxley has given us in these pages a most instructive sketch of the scope and course of modern biological science; of the condition of its several great divisions when Sir R. Owen commenced his career; and of the influence of his work upon the extraordinarily rapid advance of biology in the course of that time.

For this we are extremely grateful. It forms a fitting conclusion to a most interesting biography of one of whom all English naturalists may well be proud.

Allen's Naturalists' Library. Edited by R. B. SHARPE.—*A Handbook to the British Mammalia.* By R. LYDEKKER. Crown 8vo, pp. i-xiii; 1-340. London: W. H. Allen & Co. 1895.

IN his Preface to this volume Dr. Sharpe remarks upon the significant fact that at the present day no author pretends to write a complete account of his subject who does not take some notice of its palæontological aspect, and he considers himself fortunate in having secured the assistance of Mr. Lydekker in the preparation of this record of our British Mammalia past and present. As regards the "past," we may echo Dr. Sharpe's sentiment, but not as regards the "present"; for on the very next page we read, in the author's own words, the curious statement that he "makes no claim to being an observer of the habits of British mammals," though he undertakes to write about them, a remark which he subsequently justifies by the many mistakes into which he unwittingly falls.

We also learn from the Preface that Mr. Lydekker is not an advocate for the adoption of the *Scomber scomber* principle in zoological nomenclature. Dr. Sharpe "feels convinced, however, that the absolute justice of retaining every specific name given by Linnæus will some day be recognised." We venture to say that it is recognised now; but then, as we have already pointed out in 'The Zoologist' for December last, Linnæus did not bestow the specific name *Scomber* on the Mackerel, as alleged. A reference to the 10th edition of the 'Systema Naturæ' will show that what he did write was *Scomber scombrus*, and that by a typographical error in the 12th edition this was printed *Scomber scomber*, and

escaped detection until publication, when Linnæus, in his own handwriting, corrected it in his own copy of the work.

We are therefore quite unable to agree with Dr. Sharpe that "the correct title of the Badger should be *Meles meles*, of the Otter *Lutra lutra*, of the Roe Deer *Capreolus capreolus*," and so forth. At the same time we do not find that Mr. Lydekker has always hit upon the correct scientific appellation of some of the species. To take one example, Mr. Oldfield Thomas has lately shown reason for designating our Common Shrew *Sorex araneus*, Linn. (Zool. 1895, p. 62). With Mr. Lydekker it is *Sorex vulgaris* (p. 75).

But the chief fault we have to find with this new book on British Mammals is that it shows so little advance on the knowledge conveyed by the older text-books, except, we must admit, in regard to palæontology, which is Mr. Lydekker's strong point. Not only do we find a great deal borrowed from Macgillivray's little volume written fifty-seven years ago (much of which was doubtless correct enough at the time it was written), but statements are copied from Bell's work which have long since been shown to be erroneous. We are told that the Whiskered Bat appears to be unknown in Scotland, although at least three instances of its occurrence there are on record; that young Otters are born in March and April; that the Squirrel produces three or four young ones "about midsummer"; that the Irish Hare does not turn white in winter, and so on. We have noted numerous inaccurate statements with regard to the Chiroptera, and could fill a great many pages with corrections and criticisms of statements made regarding species belonging to other orders. We have no desire, however, to find fault, and we will therefore only express our disappointment at the contents of a book which, coming twenty years after Bell's second edition, might have been so much better than Mr. Lydekker has made it.

As for the plates, perhaps the less said the better. They not only possess no artistic merit, but many of them are quite inaccurate. It is to be regretted that Mr. Lydekker, as an instructor of the public in Zoology, did not prevail upon the publishers either to substitute better ones, or to dispense with plates altogether.

THE ZOOLOGIST

No. 220.—April, 1895.

ON SOME REMAINS OF THE URUS, *BOS PRIMIGENIUS*,
RECENTLY FOUND IN YORKSHIRE.

By JOHN CORDEAUX.

AN interesting discovery in connection with this most ancient and noble beast was recently made in the submarine forest at low water on the Yorkshire coast a few miles north of the Spurn. The forest-bed is a thin seam of peat, resting on a sandy gravel, full of the roots of trees and stumps *in situ*; occasionally under the action of the waves the entire trunk of a tree is exposed, and bones of various mammalia are of frequent occurrence.*

In the present instance an entire and almost perfect head with horn-cores of the Urus was dug up. Unfortunately, in removal, the two men who carried the head to Easington village left the lower jaws on the sands, and the tide returning either washed them to some distance, or covered them with silt. The head came into possession of Dr. Hewetson, of Leeds, who has a residence at Easington, where, shortly after it had been found, I had the pleasure of inspecting it.

Four ribs were found in the same place, and some other bones, but no vertebræ or large bones of the limbs. The position of the bull at the time of his death had evidently been on his back, the head and horns buried in mud and silt; it is probable that the larger bones of the limbs and those of the body had been dragged

* Since this was written other bones have been found; a bluestone celt and a sandstone celt, flint-flakes, portions of ribs and a jaw pierced and splintered by powerful canine-teeth, also portions of pointed wooden stakes, one being five feet in length.

away by Carnivora. The ribs were gnawed along their edges, and also the bones of the nose, but these latter slightly, as if by some small rodent. The skull was to some extent encrusted with iron pyrites.

The following are the measurements:—

	ft.	in.
Extreme sweep of horns, measuring behind . . .	4	1
Widest sweep of horns, or extreme breadth from curve to curve	2	3 $\frac{1}{4}$
From tip to tip of horn-cores	1	9 $\frac{1}{2}$
Girth of horn-cores at base	—	9 $\frac{7}{8}$
Outside sweep left horn-core	1	8 $\frac{3}{4}$
Outside sweep right horn-core	1	9 $\frac{1}{4}$
Across forehead	—	9
Length of skull	2	1
Distance between orbits	—	9
From top of occipital ridge to centre of line drawn between the orbits	—	9
Diameter of orbits	—	3
Sweep or curve of ribs	2	1
Breadth of ribs	—	2 to 2 $\frac{1}{2}$

Three molars and two premolars on each side in skull; the first premolar on each side is wanting, having dropped from the socket.

The turbinated bones, which were subsequently detached, show the intricate convolutions; they are delicate bony structures, as thin as note-paper, with an enormous development of surface for the termination of the olfactory nerves.

The great size of the eye-cavity and the construction of the turbinal bones are suggestive of extraordinary powers of sight and smell. The ribs, compared with a modern short-horn, have very little spring; *Bos primigenius* was flat-sided and gaunt.

With this grand framework of bone before us it is easy, with a little imagination, to make the dry bones live, and build up a form sufficiently vivid to recall the grandeur and majesty of this beast—the mighty monarch of a primeval forest, where once he roamed in great herds in undisputed possession, through the length and breadth of a great lone land, and across wastes and moors now lost under salt water; but in those distant times there was no North Sea separating Britain from the Continent; all was land from the hundred-fathom line west of Ireland to the furthest bounds of Asia.

Cæsar himself ('De Bello Gallico,' vi. 21), in describing these wild oxen, remarks, with pardonable exaggeration, "Hi sunt mag-

nitudine paulo infra elephantos." In colour white, or yellowish white; a broad, square, and slightly concave forehead matted with shaggy hair; intense black muzzle; sweeping dark-tipped horns, curved inward, and measuring one-third longer than the cores; ears filled with red or black hair; eyes large; fierce and untamable.

From a study of the peat-seam in this particular locality we may learn something of the bull's forest companions and of his special surroundings; bones of Wild Boar, Red-deer, and Reindeer; red-oak, beech, silver-birch—the stake-like stumps of the latter so closely set that, if each represents a separate tree, there would scarce be room for a Fox to creep between; hazel, too, in abundance as undergrowth, and many another tree which only a specialist can name. There are hazel-nuts in plenty, both entire and split, as if by Squirrels; the bole of an oak has a Woodpecker's hole in it. All these tell the same story; it is the story of a forest-land in character very much resembling an English wood. Possibly our great white Bull trampled under his hoof blue hyacinth, anemone, and primrose, and watched the gambols of Squirrels and the prowlings of Badger, Wild Cat, Otter,* and Fox. The strong and mighty have succumbed to the force of circumstances; the shy, the unobtrusive, and the cunning have survived to the present time.

Within a few hundred yards of the forest-bed are the graves of the bull's contemporaries—the Nimrods of that younger world, whose burial mounds the ever-encroaching sea is slowly excavating and exposing the contents to modern eyes. Here the neolithic savage has lain for ages, doubled knee to chin within a rough cist of stone-hewn logs, dove-tailed at the angles, or in the scooped-out trunk of a tree; and a great mound of red soil, laboriously heaped above by slaves of the sorrowing tribe, is sown throughout with flints of various design, perfect and imperfect, but all bearing unmistakable traces of man's own handiwork. I have frequently come across bones split longitudinally near these mounds, and in the kitchen-middens on the coast—relics of feasts, and cleft to extract the marrow: these are both animal and human. Neolithic man was sometimes a cannibal. The end of a Deer's bone found embedded within a few feet of the Bull's skull had been perforated through the fosse, probably by human agency.

* The perfect skull of an Otter has been recently found in the same locality.

The question has often been raised, When did the Urus become extinct in the British Islands? The chief supply of animal food in Roman Britain appears to have come from the Red-deer, the little Celtic Ox, *Bos longifrons*, and the Pig. I have, however, seen in the north of the island, in excavations thrown out from camps along the wall, fragments of the upper portions of skulls and horn-cores of a great Ox, which, if not *Bos primigenius*, must have been a very near relative. Far into the historic period, in Denmark and the north land, the horns of the Urus, rimmed with silver, formed the drinking cups of the Vikings.*

THE IRISH STOAT DISTINCT FROM THE BRITISH SPECIES.

BY OLDFIELD THOMAS & G. E. H. BARRETT-HAMILTON.

AT the request of the American naturalist, Mr. Outram Bangs, we have made an examination of all the specimens of Stoats in the collection of the British Museum, in order to see whether certain markings pointed out by him as distinguishing the Old World Stoat from that found in the Eastern United States were quite constant throughout a series. As the peculiarity referred to was simply the relative distribution of the brown and white of the summer coat in an animal which changes to pure white in winter, we were prepared to meet with a considerable amount of variability among the specimens examined, and have therefore been much interested to find that, on the contrary, there is a remarkable uniformity in coloration throughout the series, in so far at least as Scotch and English specimens are concerned. Of these we have seen a sufficient number to be able to speak with some degree of certainty. In all of them the white or yellowish-white colour of the under surface commences at the side of the naked nose-pad, passes more or less broadly along the upper lip, extends on the throat, chest, and belly to their extreme outer edges, the line of demarcation being straight and well defined. On the fore limbs it passes down to the wrists, and on the hind limbs to the ankles, while

* As to the use of Bison-horns set in silver as drinking-cups, see 'The Zoologist' for January last, p. 6.

both the anterior and posterior digits are also whitish, often continuously so with the ground-colour of the belly. It should be added also that the white of the under side has always more or less a yellow hue, at least in the adult.

With this description agrees not only every Scotch and English specimen we have examined, but also all we have been able to see from the northern parts of the Continent, including some from such widely remote countries as Norway, Hungary, and West Siberia, while even those from North-West America have a precisely similar arrangement of colour on the dorsal and ventral surfaces.

But, as pointed out to us by Mr. Bangs, specimens from the Eastern United States are characterized by a reduced extension of the light-coloured portion of the body and limbs, and it has therefore been somewhat surprising to find that such examples from Ireland as we have examined agree in these respects, not with the British, but with the American Stoat. This resemblance, however interesting, is clearly not a sign of specific identity with the American Stoat, for in other respects (such as its greater size, longer tail, and the details of coloration) the latter is so distinct from the Irish form that no further reference to it is here necessary.

But in its relation to the British Stoat, viewed in connection with the remarkable uniformity in colour of the latter, we cannot consider the Irish form as referable to the same species, and would propose to distinguish it as follows:—

PUTORIUS HIBERNICUS, *sp. n.*

Smaller than *P. ermineus*, the male scarcely exceeding in size the female of that species. Tail rather shorter. Ventral surface white or with a faint tinge of yellow,* and the distribution of the colours very much as in the Weasel, and not as in the Stoat. The white limited beneath the head to the chin and throat, not extending to the upper lip, contracted on the chest to a narrow median line (or even interrupted altogether), and similarly narrowed on the belly, but keeping its full breadth across the axillary and inguinal regions. On the fore limbs the white ends about

* In old male specimens it is as yellow as in the female or immature Stoats, but, comparing like sexes and ages, *P. hibernicus* is decidedly less yellow below than *P. ermineus*.

the middle of the fore arm, and on the hind limbs at the middle of the tibia; the feet, above and below, are usually entirely brown, except for a few scattered hairs on the toes.

Skull of male about equal in size to that of a female *P. ermineus*, and just intermediate between those of the male *P. ermineus* and the Weasel.

Dimensions, measured in the flesh, of the specimen we propose to select as the type—an adult male, killed at Enniskillen, Co. Fermanagh, on Jan. 7th, 1895, and presented to the British Museum by Mr. J. E. Harting. Head and body, 228 mm.; tail, 88; hind foot, 40; ear, 21. Basal length of skull, 41·2.

The first Irish specimen received by the Museum was obtained by Col. Yerbury at Carna, Co. Galway, in Jan. 1893, and besides the type, Mr. Harting has recently placed a second skin from Co. Fermanagh at our disposal. To Sir Douglas Brooke we also owe three specimens from Colebrook, Co. Fermanagh, and male examples have been sent to us from Armagh and Wexford; so that different parts of Ireland are well represented.

As it thus proves that we have in the British Isles three animals of this group, it seems convenient to have three English names for them, and we would suggest the use of the Irish word for the animal, modified to suit English pronunciation. Thanks to the kindness of Messrs. Pocock and McSwiney, who are authorities on Irish Gaelic, we are informed that the name is *Easóg*, pronounced *Assogue*, and the latter form we propose to use as the English name of *Putorius hibernicus*.

With regard to the relationship of *P. hibernicus*, it should be borne in mind that the Weasel itself only differs from the Stoat by the following four characters—(1) smaller size, (2) shorter tail, not tufted, (3) white instead of yellow or yellowish white belly, and (4) less extent of light colour below; and that as to (1) *P. hibernicus* is intermediate, and approaches the Weasel in (3) and agrees with it in (4), and therefore that the only character which is decisively Stoat-like is (2), the fairly long and broadly black-tipped tail, and even this is shorter.

In the ground colour of the upper surface, however, the *Assogue* is even darker than the Stoat, our specimens, all killed in winter, being as dark as the darkest summer Stoats.

It would therefore seem as though the popular name Weasel instead of Stoat for this animal in Ireland were almost justified by

its zoological characters; but for a proper knowledge of this and many other points about *Putorius hibernicus* we must be content to wait until more specimens have become available for examination.

Another point in which *Putorius hibernicus* resembles the Weasel rather than the Stoat is in the normal absence of a winter change of colour in similar latitudes. The Stoat turns white in winter, except in the more southern districts of England, whereas in ordinary circumstances the Weasel does not do so. The *Assogue* agrees in this respect with the latter in that it hardly ever turns white in winter, and the few cases in which it has been known to do so must be regarded as exceptional.*

At all events Thompson states that he had never seen or heard of a white Stoat in Ireland, although he had examined specimens in the winter garb, *even in mild winters*, which had been killed in the nearest parts of Scotland—Ayrshire and Wigtownshire.† The result of Mr. A. G. More's experience, after many years of close observation, agrees entirely with that of Thompson, and he informed us that he had never met with even a record, much less a specimen, of a white Irish Stoat. This seems the more remarkable when we find that the Irish (or Alpine) Hare assumes the winter coat (though seldom completely) in many parts of Ireland, and we might expect that, in the same way, the Stoat in Ireland might also occasionally be found in the transition stage, with a pied coat, such as it so commonly assumes in the Midland counties of England. Be that as it may, we have never come across more than two specimens of the Irish Stoat showing the winter change of colour. One of these is a mounted specimen in the Museum of Science and Art at Dublin, labelled "Co. Wexford," and lent by Mr. L. Grattan Esmonde: it is entirely white, with the exception of a

* Mr. G. H. Kinahan, writing in 'Land and Water,' June 11th, 1892, remarks:—"Piebald Stoats are not very uncommon. Years ago my brother had a remarkably large piebald buck Stoat that was killed in a rat-trap in our house in the Co. Dublin. About the same time a smaller one was caught in a trap set in a rabbit-run. I shot a piebald Stoat at Portraine, Co. Dublin, and I saw a very white one chasing a Rabbit in Coole Park, Co. Galway. Others I have seen were in the Burren, Co. Clare, and in the crags of Galway, Mayo, &c." Presumably Mr. Kinahan refers to Stoats which had whitened in winter, and not to complete or partial albinos, though he does not make this quite clear.

† 'Natural History of Ireland,' vol. iv. p. 7.

large black tip to the tail, and the upper parts of the head and neck, which are of the normal colour.* The second is in the collection of Mr. R. M. Barrington, at Fassaroe, Bray, Co. Wicklow. It was killed near Ashbourne, Co. Meath, and is pure white, with the exception of the tip of the tail, the forehead, and two small spots on the back of the neck.†

Possibly the explanation of the fact that whereas many Irish Hares turn white every winter, the Irish Stoats do not do so, is to be found in the different nature of the country inhabited by the two animals. In Ireland it is chiefly, though by no means entirely, the Hares which inhabit the bare and exposed mountains that turn white, while the lowland Hares often keep much of their summer colour all through the winter. The Stoat, however, being a carnivorous animal, naturally keeps in winter to the more sheltered and lower-lying districts, especially in the neighbourhood of farmyards, where its prey is more abundant, and hence avoids the extreme rigour of the climate. In England and Scotland, however, the winters are usually more severe than in Ireland; hence the Stoat more frequently turns white there, especially in the northern districts.

We do not think it is necessary to give references to the numerous occasions on which the Weasel has been reported from Ireland, since the more important have been recently collected by Mr. J. E. Harting.‡ Many of these are certainly due to the fact that, as now shown, the Irish Stoat does actually closely resemble the Weasel, and is not inappropriately called by that name,§ ever since Giraldus Cambrensis, in his 'Topographia Hibernica,'

* 'Land and Water,' May 28th, 1892. † Id., June 4th, 1892.

‡ 'The Zoologist,' December, 1894, pp. 450—453.

§ The words of the late Col. J. J. Whyte, of Sligo, may be quoted to show how perplexed good out-of-doors observers could be over *Putorius hibernicus*, and what a large foundation in fact underlaid the frequent reports of the occurrence of the Weasel in Ireland. Col. Whyte wrote ('Field,' July 11th, 1874):—"I am aware that it is the right thing to say that we have no Weasels in Ireland; *certes*, I never saw an animal of the sort without the black tip to the tail. Many of them,—I may say most of them,—however, are so small that *a man who does not profess to be a naturalist is left in doubt whether he is not looking at a Weasel with a black tip.*" (The italics are ours.) "I have one before me now, an old bitch, giving suck,—whose size is exactly that given by Bewick as that of the Weasel,—7½ in. from nose to tail; tail, 2 in., brush, ¾ in. I do not remember ever seeing any so small in England, though common enough here, as well as the larger size."

showed what a good observer he was by his statement of Ireland, that "*mustelæ hic multæ sed minutæ plurimum et subrufæ.*"*

In conclusion, we should like to mention that there is in the County Cork a pack of hounds called the Cork Weasel Hounds, which, as a sporting institution, we believe to be unique. These hounds are hunted on foot from April 1st to the end of October, and appear to give good sport at a time of year when there is no fox-hunting; but their best month is May, and after that September and October. Some idea of the sport obtained may be gathered from the accounts which have been published from time to time in the columns of 'The Irish Sportsman.'

[We are not, of course, responsible for the views expressed by our correspondents; but lest it should be supposed that "silence gives consent," we must here take occasion to protest against the adoption of the barbarous name *Assogue* proposed for the Stoat of Ireland. Whether the animal be or be not specifically distinct from the English Stoat, a point upon which we are at present by no means satisfied, we see no reason why it should not be referred to as the *Irish Stoat*, just as we speak of the *Irish Hare*. We cannot admit that the spelling of an Irish name as it is pronounced makes it English.—ED.]

OBSERVATIONS ON BIRDS IN MID-WALES.

By J. H. SALTER.

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DURING the past year three valuable local lists of Welsh birds have been contributed to 'The Zoologist' by Messrs. F. C. Rawlings, Harold Raeburn, and O. V. Aplin respectively. Taken in conjunction with the appearance of the Rev. Murray A. Mathew's 'Birds of Pembrokeshire,' they have thrown much light upon the distribution of birds in the Principality, hitherto perhaps, ornithologically, the most neglected part of the British Islands. Upon the same subject the following observations may be acceptable as confirming, and in some cases supplementing, what has been already published. My notes are derived from observations made at Aberystwyth during a residence there of rather more than three years, and the remarks about each species apply primarily to that neighbourhood. At the same time I have

* Harting, "Annals of Irish Zoology," 'Zoologist,' Nov. 1881, p. 38.

included the results of many excursions on foot in quest of birds throughout a wider district, which may be roughly described as embracing the northern half of Cardiganshire, Merionethshire as far as Barmouth and Dolgelley, Radnorshire west of the Wye, and those parts of the counties of Brecknock and Carmarthen which border on Cardiganshire. I have but little information as to the southern half of the last-named county.

In compiling the following list, I have received much assistance and information from Capt. G. W. Cosens, of Llanbadarn; Mr. F. T. Fielden, of Borth; Mr. W. B. Powell, of Nanteos; and Sir Pryse Pryse, Bart., of Gogerddan; and I have in addition to thank these gentlemen for permission to inspect their collections of local birds.

By inserting the mere names of species which do not call for remark, I have aimed at presenting a preliminary list of the birds of Cardiganshire. Other names will doubtless be added. The Twite will no doubt be found upon the moors as the result of more careful search, and the White Wagtail will probably be detected amongst the spring arrivals of the pied species. Thus the present list is merely tentative.

As has been already pointed out, the available information as to the distribution of several of the summer migrants in Wales has hitherto been of the most meagre description. The Redstart and the Garden Warbler may be quoted as examples. Of the former, Mr. Howard Saunders says, in his invaluable 'Manual,' "In Wales it is common as far as Breconshire"; and of the Garden Warbler, "Not known to breed in Wales beyond Pembrokeshire and Breconshire." As a matter of fact the range of the Redstart extends much further west than is here stated, while the Garden Warbler, as Mr. Mathew has shown, is extremely rare in Pembrokeshire, being, like the Redstart, excluded from the greater part of that county by the barrier of the Precelly Hills. Both are common in Cardiganshire in suitable localities, but this condition is always necessary. In a country which is in general so bare, it is impossible that Warblers of any kind should be so numerous as in Southern and Eastern England. In North Cardiganshire dykes of earth largely take the place of hedges. Wood occurs chiefly in the form of larch-plantations or oak-scrub, which on shallow soil and exposed to westerly winds never grows into timber. Sheets of fresh water, with the ex-

ception of the "llynns" or tarns upon the hills, are almost entirely wanting. The rivers are swift mountain streams with no margin of reeds or sedge. A rock-bound coast holds out no attraction to wildfowl or wading-birds, and many of those which figure upon the list occur only, so far as this county is concerned, in the estuary of the Dovey. Cardiganshire lies far back in the bay, contrasting in this respect with Pembrokeshire, whose islands and far-stretching headlands naturally intercept many birds as they pass up and down St. George's Channel. Inland the county is everywhere cut off from the rest of Wales by a wide stretch of bleak uplands, except on the north, where the Cader Idris range forms a still higher barrier. The Plynlimmon range and its southern extension, forming the backbone of Wales, might be expected to exclude some of the more delicate Warblers from entering Cardiganshire. This appears to be the case as regards the Lesser Whitethroat; while some resident birds, as the Nuthatch, Hawfinch, and Tree Sparrow, only occur very exceptionally on the western side of the mountains. The way in which our summer migrants avoid, as far as possible, crossing exposed and treeless moors is well known; and, as shown in 'The Birds of Devon,' is exemplified by the case of Dartmoor. Hence it becomes a problem to ascertain in what way the summer migrants reach this county. A few species may come from the south, making a westerly deviation to round the hill-district of North Pembrokeshire. The Wheatear and Swallow, upon their northward passage, seem to some extent to follow the coast. But there is no evidence that the bulk of the summer birds enter the county in this way. The Wye valley seems to furnish a possible highway, leading up, by means of its highest tributary, to a narrow *col* in the Plynlimmon range at a height of 1360 ft. From this point there is a rapid descent at once into Cardiganshire. If this route were made use of, any given migrant should appear at Aberystwyth very shortly after its arrival on the Upper Wye. On March 29th, 1893, the Redstart was singing at a point six miles above Rhayader, and two days later had arrived in force; but I did not hear one in Cardiganshire till April 5th, and then not at Aberystwyth, but at Glandovey, in the extreme north of the county. The Willow Wren had reached Rhayader on March 31st, 1894, but I did not hear it at Aberystwyth, only thirty miles away, till April 7th.

The only other route which it appears that migrants might take, if wishing to avoid crossing the mountains, is that made use of by the Cambrian Railway. Leaving the Severn, it follows up a tributary stream to its source, crosses the "divide" at no great height, and runs down into Cardiganshire beside an affluent of the Dovey. I think, perhaps on slender evidence, that the migrants find their way into the county through this break in the hills, and thus approach Aberystwyth from the north. This appears likely from the fact that the Redstart and Tree Pipit are usually to be heard at Glandovey two or three days before they are noted at Aberystwyth. I have given the dates of arrival of most of the summer migrants for the past three seasons, in the hope that comparison with others noted elsewhere may throw some light on migration routes.

If space permits, I hope on a later occasion to call attention to several particulars in which the avifauna of Pembrokeshire offers interesting points of comparison with that of Cardiganshire. At present I can only acknowledge my indebtedness to 'The Birds of Pembrokeshire' and its author.

PASSERES.

REDSTART, *Ruticilla phœnicurus*. Usually said to be of uncommon occurrence in Western Wales, but visits many localities about Aberystwyth, and in those which are suited to its habits. In Llyfnant Valley, for example, it is abundant.

BLACK REDSTART, *R. titys*. A female or immature male was seen by Mr. F. T. Fielden, of Borth, in the winter of 1886-87, sitting upon some railings beside the railway-line.

REDBREAST, *Erithacus rubecula*.

STONECHAT, *Pratincola rubicola*. A few pairs about furze-grown hill-sides near the sea, frequenting the same spots year after year, and never increasing in number. They do not leave us in time of snow or frost, but, in company with Pipits, find insect-food about the seaweed-heaps on the beach. The males begin to sing on quiet evenings about March 1st. Laying sometimes begins by the end of that month. The usual date of hatching is April 20th, and the young leave the nest by May 2nd. Three days later I have seen the hen-bird carrying materials for a second nest. The young birds do not appear upon the tops of the furze-bushes till some days after they have left the nest.

Occasionally the birds will scold vigorously in mid-winter. Inland I have only seen the Stonechat on the sides of the Wye Valley about Rhayader.

WHINCHAT, *P. rubetra*. Not numerous. First seen in 1892, April 30th; 1893, April 22nd; 1894, April 25th.

WHEATEAR, *Saxicola œnanthe*. First seen, 1892, March 20th; 1893, March 12th; 1894, March 18th. Last seen, 1891, October 18th. The female is said to be later by at least a fortnight, but in 1893 I noted one on March 22nd. By the end of the month Wheatears are found in all parts of the hill-district, up to the tops of Cader Idris and Plynlimmon. The first birds to arrive at Aberystwyth are those which stay the summer, but migration continues for six or eight weeks. Thus in 1892 the chief passage took place about March 30th, and was nearly over by April 3rd; but fresh arrivals were still to be seen in May of that year as late as the 20th of the month. I imagine that these later birds go very far north. The Wheatear's absence from this district scarcely exceeds five months. On April 19th, 1893, at Borth, I watched a male bird whose breast was of as rich a buff colour as that of the Whinchat.

SONG THRUSH, *Turdus musicus*.

REDWING, *T. iliacus*. Only numerous after a fall of snow, when many pass down the coast with Starlings and Skylarks.

MISSEL THRUSH, *T. viscivorus*.

FIELDFARE, *T. pilaris*. Scarcely seen at Aberystwyth, except in time of snow or frost. None this winter up to the present date (Dec. 21st). Late in March I have found small parties in the upland districts near Plynlimmon and on the slopes of the Brecon Beacons.

BLACKBIRD, *T. merula*.

RING OUZEL, *T. torquatus*. Finds few localities to suit it upon the Cardiganshire side of the mountains, but is numerous in the more rocky valleys of the Upper Wye, Towy, and Yrfon. May be seen in summer up to the top of Cader Idris and Aran Mawddy. First seen, 1892, March 28th; 1893, March 29th; 1894, March 25th.

DIPPER, *Cinclus aquaticus*. Absent from the Ystwyth, and from other streams which are fouled by lead-washings, but is numerous upon the upper waters of the Wye and Towy. It follows up the streams as far as the Teifi pools (1700 ft.), and to within a short distance of the top of Cader Idris.

WREN, *Troglodytes parvulus*.

GOLDCREST, *Regulus cristatus*. Common. On March 26th, 1894, I noted one near the head of the Towy Valley, far from trees.

CHIFFCHAFF, *Phylloscopus rufus*. Less numerous than the Willow Warbler, though Rev. Murray A. Mathew finds the contrary to be the case in Pembrokeshire. First heard, 1892, April 3rd; 1893, March 21st; 1894, March 26th.

WILLOW WARBLER, *P. trochilus*. First heard, 1892, April 9th; 1893, April 4th; 1894, April 7th.

WOOD WARBLER, *P. sibilatrix*. Numerous in all suitable localities, its range extending to the highest beech and oak plantations in the valleys. On the Upper Towy decidedly more numerous than either Chiffchaff or Willow Wren. First heard, 1892, May 1st; 1893, April 19th; 1894, April 22nd.

WHITETHROAT, *Sylvia cinerea*. Abundant. In the warm spring of 1893 the Whitethroats had nests full of eggs a fortnight or three weeks before the usual time. First heard, 1892, May 6th; 1893, April 19th; 1894, April 18th.

LESSER WHITETHROAT, *S. curruca*. Occurs very rarely in Cardiganshire, if at all. There is one at Gogerddan, in a case of small birds, all of which are believed to be local. Included by Mr. F. C. Rawlings in his Barmouth list.

GARDEN WARBLER, *S. hortensis*. Regularly visits a few sheltered woods and thickets, but is less numerous than the Blackcap.

BLACKCAP, *S. atricapilla*. Occurs wherever there is suitable shelter, and in wooded valleys, like those of the Llyfnant and Mawddach, is numerous. Breeds as high up the Towy Valley as Fanog. First heard, 1892, May 4th; 1893, April 19th; 1894, April 21st.

SEDGE WARBLER, *Acrocephalus phragmitis*. Only numerous upon Borth and Tregaron bogs; elsewhere suitable cover is scarce. First heard, 1892, May 6th; 1893, April 22nd; 1894, April 27th. The Reed Warbler is entirely absent.

GRASSHOPPER WARBLER, *Locustella naevia*. There is some reason to think that this bird may only have reached this part of Wales of late years, as Mr. Rawlings suggests in his Barmouth list. Mr. F. T. Fielden did not hear it at Borth till 1893. It is local and not numerous about Aberystwyth. First heard, 1892,

May 5th; 1893, April 18th; 1894, April 28th. On May 13th of this year I heard it near Aberaeron.

GREAT TIT, *Parus major*.

MARSH TIT, *P. palustris*. Not at all plentiful, by far the least numerous of the Tits, though Rev. Murray A. Mathew finds it abundant in Pembrokeshire. Met with more frequently in the valleys of the Wye and Towy, where there is decayed timber in which it can peck out nest-holes.

COAL TIT, *P. britannicus*.

BLUE TIT, *P. cæruleus*.

LONG-TAILED TIT, *Acredula rosea*.

GREAT GREY SHRIKE, *Lanius excubitor*. Mr. Hutchings has had two or three for preservation, one of which I have seen.

RED-BACKED SHRIKE, *L. collurio*. A few pairs visit us, and are the last of the summer migrants to arrive, not appearing before May 23rd. More plentiful at Barmouth, where I saw a brood, which had just left the nest, on the hill behind the town, July 1st, 1892. One at Llechryd, near Cardigan, June 29th, 1894.

GOLDEN ORIOLE, *Oriolus galbula*. Mr. Hutchings has never had a Cardiganshire specimen, but a pair of birds reported some years since as having been seen at Llidiardau, Llanilar, must have been of this species.

PIED FLYCATCHER, *Muscicapa atricapilla*. Probably occurs in Central Wales, wherever there is suitable timber. Many newly-arrived males amongst old oaks beside the Elan, near Rhayader, on May 8th, 1892. It swarms amongst decayed oaks, birches, and alders on the sides of some of the upland dales in North Carmarthenshire. In this locality the nests were ready for eggs on May 6th, 1894, though the birds can only have arrived a few days previously. In Cardiganshire it occurs at Hafod, and about 1882 Capt. G. W. Cosens obtained one at Cwm, near Aberystwyth. On May 2nd, 1894, I saw one at Llyfnant Valley, singing in some oaks on the Montgomeryshire side of the stream. In Merionethshire I hear of it at Peniarth Uchaf, and in woods by the Artro and Nantcol above Llanbedr. Besides its song it has several notes, one of them suggestive of the Goldfinch.

SPOTTED FLYCATCHER, *M. grisola*. Fairly numerous. Rather late to arrive: 1892, May 14th; 1893, May 9th; 1894, May 15th.

PIED WAGTAIL, *Motacilla lugubris*. The few individuals which stay the winter are not easily driven southward by frost. The first arrival of any note is always about March 12th, and fresh comers swarm upon the seaweed-heaps all through April.

GREY WAGTAIL, *M. melanope*. Specially numerous upon the upper waters of the Wye and Towy, but a few, in place of retiring to the hills, breed within a mile or two of Aberystwyth. I found it already in its summer haunts on March 26th, 1894.

YELLOW WAGTAIL, *M. raii*. Curiously local in Western Wales. Mr. Mathew doubts whether it breeds in Pembrokeshire. Rarely seen at Aberystwyth, and then always upon the same marshy fields, but is common at Borth in wet meadows near the Dovey, and very plentiful upon the Teifi Bog, near Tregaron.

MEADOW PIPIT, *Anthus pratensis*. Reinforced by flocks which arrive at the same time as the Pied Wagtails, as on March 13th, 1892; March 21st, 1894. A flock working up the Wye Valley, above Rhayader, March 28th, 1892. Parties are seen moving southward in September.

TREE PIPIT, *A. trivialis*. As numerous as can be expected in a sparsely wooded district. First heard, 1892, April 15th; 1893, April 5th; 1894, April 9th.

ROCK PIPIT, *A. obscurus*. Occurs all along the coast, but is not very numerous.

HEDGESPARROW, *Accentor modularis*.

BULLFINCH, *Pyrrhula europæa*.

GREENFINCH, *Ligurinus chloris*. For three years has commenced its drawling note within a day of March 12th.

GOLDFINCH, *Carduelis elegans*. More plentiful than I have found it anywhere in England, and does not seem less numerous in winter. The large amount of waste and semi-cultivated land is in its favour.

SISKIN, *Chrysomitris spinus*. Rare, and irregular in its visits. There is one at Gogerddan; another shown to me by Mr. Hutchings. I have many times scanned the alders and birches for this and the next species, but fruitlessly.

LESSER REDPOLL, *Linota rufescens*. A few pairs may nest with us, an instance, as we suppose from the description given, having occurred at Gogerddan last year. At Peniarth, above Towyn, Mr. F. Abel found two nests in 1890, lined with the down of the cotton-grass.

LINNET, *Linota cannabina*. The brambles and furze of the slopes near the sea exactly suit this species. Few are to be seen from September to March, so that there is probably a partial migration.

HAWFINCH, *Coccothraustes vulgaris*. Very rare in Cardiganshire, but may possibly have bred, for Capt. G. W. Cosens has two which were shot at Ynyshir, Glandovey, about 1868, after they had destroyed a row of peas by biting across nearly every pod. There are two at Gogerddan from the same neighbourhood, in which Sir Pryse Pryse considers that thirty years ago it was not uncommon.

CHAFFINCH, *Fringilla cœlebs*. In 1892 still flocking on March 26th; but in 1893, a much earlier season, the nests were nearly built, and one quite ready for eggs, on March 30th.

BRAMBLING, *F. montifringilla*. Occurs when the first heavy snowfall of the winter brings a rush of migrants along the coast, as on January 9th, 1892; January 6th, 1893; January 13th, 1895. Bramblings were to be seen in every stack-yard on January 7th, 1893, male birds being more numerous. A female, with Chaffinches, in the Wye Valley above Rhayader, March 28th, 1892.

TREE SPARROW, *Passer montanus*. I have never detected this bird in Western Wales, and am doubtful of its occurrence. Mr. Mathew knows of no instance in Pembrokeshire. There are two at Gogerddan in a case of small birds, all of which are believed to have been obtained there; and Mr. Hutchings tells me that he has received specimens.

HOUSE SPARROW, *P. domesticus*. Scarce in the hill districts. I have not seen it about the scattered farms on the upper Towy.

CROSSBILL, *Loxia curvirostra*. Mr. Hutchings remembers a flock of about fifty at Tan-y-bwlch; this was probably in 1868. About 1879, "greenish birds, with some red about them, in the fir trees," were reported to Capt. G. W. Cosens. One, a red bird, was sent from Machynlleth to be stuffed last winter.

BUNTING, *Emberiza miliaria*. Local, but in general common near the coast. Extends up the Rheidol Valley as far as patches of arable land are to be found, for on March 29th, 1893, I heard it singing beyond Pont Erwyd. Chiefly absent in winter, returning in February,

CIRL BUNTING, *E. cirrus*. The recent extension of range by which this species has reached Cardiganshire has been already

noticed in 'The Zoologist.*' It is not at all numerous as yet at Aberystwyth, but probably extends along the whole coast of this county, as in June of the present year I met with it at New Quay, Aberporth, &c., showing a partiality for ferny "cwms," with brier and bramble thickets.

REED BUNTING, *E. schoeniclus*. Local; Borth, Tregaron, and Clarach bogs, and after a snowfall in stack-yards.

SNOW BUNTING, *Plectrophenax nivalis*. Numerous after the snowfalls of January 9th, 1892, and January 6th, 1893. Two on Constitution Hill, Aberystwyth, March 12th, 1893. One, a very tame bird, on Borth golf-links, April 9th, 1894.

STARLING, *Sturnus vulgaris*. Still flocking, May 1st, 1892. Absent as a breeding species from many of the hill districts. I have not seen it in the upper part of the Towy Valley.

CHOUGH, *Pyrhocorax graculus*. This decreasing species has probably ceased to breed within twenty miles of Aberystwyth. Nesting commonly some years since, both to the north and south of the town, persecution had left but five members of the colony in the summer of 1892, and these were reduced to three by the autumn. On April 4th, 1893, I saw a pair which were doubtless nesting in the usual spot—the roof of a cave, the only one upon this piece of coast which is not left dry at low tide, never containing less than five feet of water, and not to be approached by boat owing to hidden rocks. Here they might have been thought safe, but I failed to see anything of them in 1894. Mr. Hutchings tells me that he has been offered 7s. each for the eggs. Somewhat further afield, however, the Chough still survives, and cannot fail to be met with in every cliff-walk. At the end of June, 1894, I met with single birds, pairs, and parties of from three to six at frequent intervals along some twenty miles of coast. One family of eight walked tamely about the grass, faintly cawing, the young birds allowing me to come within forty yards. I could note their restless manner upon the ground, much more like the Starling than the Jackdaw. Few parts of the Merionethshire coast are suited to the Chough, but inland three or four pairs frequented the Bird Rock, where, however, as Mr. Abel tells me, none have been seen since 1887. The Chough does not seem to wander, and seldom revisits haunts from which it has disappeared. Mr. F. T. Fielden has only met with it once at Borth.

* 'Zoologist,' 1892, p. 180.

MAGPIE, *Pica rustica*. Very abundant, especially in the hill country, breeding in the few trees to be found round the sheep-farms. I have seen thirteen at a dead sheep, and one attempting to kill a Starling in snow-time, January 11th, 1892. A pair began to put their nest in order, January 12th, 1894.

JAY, *Garrulus glandarius*. Numerous wherever game-preserving is not strict or general. Breeds as high up the valleys as stunted oak woods extend.

RAVEN, *Corvus corax*. Still numerous, and probably not decreasing. Mr. F. T. Fielden tells me that he has seen nine together near Plynlimmon. The shepherds, often enlisting the aid of a gamekeeper, lose no opportunity of shooting the hen bird from the nest, or of burning the latter by throwing down some litter which has been set on fire. I hear of the young birds being found under the nest with their heads cut off, and a party of men visit the more accessible breeding-places every year in April to take the nestlings for sale. There is a general impression amongst the farmers that the Raven will tamper with a sheep when in difficulties, and that its misdeeds at lambing time are of the blackest description. I have found one of its castings to be composed of wool, and to contain a lamb's hoof. Ravens visit Borth warren in quest of rabbits. The smooth sides of the Cardiganshire dales offer few available nesting sites, but the bolder cliffs of the upper Wye, Yrfon, Towy, &c., are tenanted by many pairs. Within the last three seasons I have visited or known of a score of nesting sites. Two of these could be reached without a rope; another by means of a short ladder. The nest is usually built of large and crooked heather stems, and as lining I have found wool, cow's-hair, and a tuft torn from the mane or tail of a dead horse. There is usually an old or partially-built nest close to the one which is occupied, and often an alternative site, which may be a mile distant. There are always two nests upon the coast near Aberystwyth, and here the eggs are laid about February 28th, the inland birds being some ten days later. One nest upon the cliff may be easily seen into from above. On April 4th, 1893, it was occupied by five young birds in black down, with pen-feathers showing in their wings. They scrambled about, jostling one another, stretched out skinny necks, and showed huge gapes, which, as five red spots, were visible even without

the telescope. This year the nest contained three young birds and three addled eggs. The former, as usual, remained a long time upon the nesting ledge. I did not see them upon the wing till May 14th, while a week later the second pair showed every indication of still having young in the nest. At the nest Ravens spend much of their time in harmless skirmishing with Buzzards, Carrion Crows, Jackdaws, and Kestrels. If the eggs are fresh, the birds are often perfectly quiet when disturbed, and will go off, allowing the nest to be reached without the slightest protest; but if there are young birds, the male dashes past with puffed-out throat and hoarse note of "pruck, pruck," or, folding one wing, will drop as if shot, turning almost over before he recovers himself; while the hen bird hurries to and fro, with quickly-beating wings, and note of "croc, croc." One bird has a note of his own, as deep as the tolling of a church-bell. At the end of March, 1894, a few days' walking in a new district introduced us to five additional pairs of Ravens. Three of the nests could be inspected from above: the first contained six eggs upon March 23rd; the second, two young ones and four eggs upon the 25th; the third, five eggs upon the 26th. Upon April 5th I looked across the ravine at Devil's Bridge into a safely-placed nest, which contained about five well-fledged young. Mr. T. J. Waddingham, of Hafod, tells me that two sets of eggs were brought to him by his shepherd, taken from the rocks near Cwm Ystwyth. At Rhayader, the carrying out of the Birmingham Water Works scheme has interfered with several nesting sites, notably the one at Caban Coch, an ideal stronghold, upon the rock marked upon the Ordnance map Craig Gigfran, immediately above the great dam of the lower reservoir. Near at hand, travellers by the Wye Valley Railway pass within a stone's-throw of a nest which overlooks the line. The Raven is always to be seen upon Cader Idris, its cliffs being tenanted by at least three pairs. It visits the Bird Rock regularly, and would breed there if allowed to do so; the last attempt having been made four years since. The bold "Cigfran" is well able to hold its own, and is in no danger at present of being exterminated, or even of becoming scarce, in Mid-Wales.

CARRION CROW, *Corvus corone*. In the hill districts to a large extent replaces the Rook. Flocks may be seen feeding in ploughed

fields, and scores resort to the same plantation to roost. Where wood is scarce the nest is in stunted birch and mountain-ash which overhang the streams, and on the bogs in willows, sometimes not more than five feet from the ground. A few pairs nest upon the cliffs in company with Herring Gulls.

HOODED CROW, *C. cornix*. Of rare occurrence at the present day, and appears to have been equally scarce thirty or forty years ago. I have only heard of four occurrences.

ROOK, *C. frugilegus*. Though rookeries are rare in the hill districts, this bird ranges over most of the upland country. I have not seen it, however, in the dale of the upper Towy, the nearest outpost in this direction being a small colony of some fifteen nests about a mile from Abergwessin.

JACKDAW, *C. monedula*. To the great abundance of this species at Aberystwyth, the disappearance of the Chough may possibly in part be due.

TREE CREEPER, *Certhia familiaris*. A common resident in the wooded districts.

NUTHATCH, *Sitta cæsia*. Common in wooded parts of Breconshire and Radnorshire, extending up the valleys as far as oak timber is to be found. In the Wye Valley it is common as far up as Rhayader. Of rare occurrence upon the western or Cardiganshire side of the hills. A specimen now at Gogerddan is believed to have been obtained there. Mr. Hutchings has one which was shot at Llanbadarn, and remembers seeing one tapping amongst some old filbert-trees at Tan-y-bwlch.

SWALLOW, *Hirundo rustica*. 1892, April 10th; 1893, April 4th; 1894, April 7th. During the spring passage, which lasts about three weeks, small parties are constantly to be seen following the coast northwards. All have left by the end of September.

MARTIN, *Chelidon urbica*. Much less numerous than the last. The few pairs which visit us arrive late, and none are seen passing with the Swallows. 1892, May 14th; 1893, May 7th; 1894, May 8th.

SAND MARTIN, *Cotile riparia*—the prevalent blue slates and grits being unsuitable—finds breeding sites only in the banks of the rivers and in the boulder clay of the cliffs. 1892, April 5th; 1893, April 23rd; 1894, April 7th.

SKY LARK, *Alauda arvensis*. Following on the first snowfall of the winter there is a rush of migrants down the coast, as on January 9th, 1892, and January 6th, 1893. Thousands of Sky Larks then pass in company with Thrushes, Starlings, and Finches. As Mr. Mathew has not met with these flocks in Pembrokeshire, they may perhaps cross to Ireland.

WOOD LARK, *A. arborea*. Resident about Aberystwyth, locally and in small numbers. I first detected it amongst Sky Larks during time of snow. Seems to prefer the Hafod estate, where I have heard three singing in one morning. One singing near Llandyssil in North Carmarthenshire, June 29th, 1894.

PICARIE.

HOOPOE, *Upupa epops*. Mr. Hutchings has preserved two or three, the last obtained at Abermade five or six years ago.

GREATER SPOTTED WOODPECKER, *Dendrocopus major*. A scarce resident in the few localities where there is suitable timber, as at Rhayader in the Wye Valley. In Cardiganshire it occurs at Cwm and Gogerddan near Aberystwyth, Lodge Park, and Glandovey; in Merionethshire at Peniarth Uchaf. Breeds in some of the upland dales in North Carmarthenshire, where I have never met with the Green Woodpecker. A nest in this locality contained four half-grown young ones and an addled egg on May 22nd, 1893.

LESSER SPOTTED WOODPECKER, *D. minor*. Scarcer than the last. An adult and a nest of young are preserved at Gogerddan, and Sir Pryse Pryse tells me that it is frequently seen there. Mr. T. J. Waddingham states that it occurs at Hafod. Mr. F. Abel meets with it at Peniarth Uchaf.

GREEN WOODPECKER, *Gecinus viridis*. Not numerous in Cardiganshire, owing to the county being but sparsely wooded, but it is not uncommon in the Ystwyth Valley. Parts of Merionethshire are better suited to its habits, and it is abundant about Arthog and Dolgelley. A nest at Peniarth, June 6th, 1894, contained five addled eggs, upon which the bird was sitting.

WRYNECK, *Jynx torquilla*. A rare occasional visitor. Capt. G. W. Cosens has a specimen, which he obtained at Cwm, Aberystwyth, about 1879. There are two at Gogerddan, where the bird is said to be heard almost every year.

CUCKOO, *Cuculus canorus*. More numerous in some years than in others: 1892, April 28th; 1893, April 19th; 1894, April 18th. In 1893 I heard the broken note, "cuc-cuc-koo," as early as May 13th. A young bird at Llanbadarn, September 10th, 1894. One found dead by Capt. Cosens had hanged itself while forcing its way into a thick syringa bush.

YELLOW-BILLED CUCKOO, *Coccyzus americanus*. The example figured by Messrs. Sharpe and Dresser in the 'Birds of Europe,' which was picked up dead on the Cribyn beach, a mile and a half north of Aberystwyth, Oct. 26th, 1870, is still in the possession of Capt. G. W. Cosens, of Llanbadarn.

NIGHTJAR, *Caprimulgus europæus*. Common about oak woods and fern-covered slopes, as at the foot of the Bird Rock. One killed itself at Bronpadarn by flying against a window. Frequently caught in pole-traps.

SWIFT, *Cypselus apus*. Common. Breeding was hindered in 1894 by cold weather at the end of May. 1892, May 3rd; 1893, May 2nd; 1894, May 5th.

KINGFISHER, *Alcedo ispida*. Absent from many streams which are fouled by lead-washing, but frequents the Teifi, the Dysynni above Towyn, and the ditches which intersect the Gors Fochno.

COLUMBÆ.

RING DOVE, *Columba palumbus*. Numerous. A flock seen on May 19th, 1894, would probably consist of the young of the first brood.

STOCK DOVE, *C. ænas*. Numerous about inland cliffs, *e.g.*, those which occur in the rocky dales of the upper Wye and Towy. The pigeons which haunt the Bird Rock, and the few pairs which frequent the sea-cliffs, are probably all of this species. Parts of the Cardiganshire coast are well suited to the Rock Dove, but I have not been able to detect it.

TURTLE DOVE, *Turtur communis*. A summer visitor in very small numbers. Breeds annually at Gogerddan and at Llanbadarn.

(To be continued.)

MEMOIR OF THE LATE A. G. MORE, F.L.S. M.R.I.A.

WITH very great regret we have to announce the death of Mr. Alexander Goodman More, which took place in Dublin on March 22nd, at the age of sixty-four. It could hardly be said to be unexpected, for so long ago as 1887 he was compelled from ill-health to resign his appointment as Curator of the Natural History Department of the Science and Art Museum, Dublin (Zool. 1887, p. 355), and since that time his strength had been gradually failing. Although not an Irishman, Mr. More had resided so long in Ireland that he had well-nigh come to be regarded as one, and for nearly thirty years he exercised an influence of a special kind amongst naturalists as an authority on Irish birds and plants. As a matter of fact he was of Scottish extraction, being the son of Alexander More, of Malvern, grandson of Alexander More, Collector of Customs, Aberdeen, and great-grandson of Gilbert More, of Rezaden, Aberdeen; while on his mother's side he was descended from Alexander Innes, of Breda and Cowie.

Educated at Rugby and Cambridge, where he was elected an Associate of the Ray Club in 1851, he went, on leaving the University, to reside for a time at Bembridge, in the Isle of Wight. At first birds, insects, and flowering plants especially attracted him, but by degrees he came to extend his observations to the small Mammalia, especially the Chiroptera, and subsequently to the Fishes. In his outdoor observations and collections he was much encouraged by the Rev. C. A. Bury, of Bonchurch, who had himself published some years previously an account of the mammals and birds of the Isle of Wight;* by the late Frederick Bond, who spent a good deal of time in the island while More was there (*cf.* Zool. 1889, p. 412); and by H. Rogers, the observant taxidermist at Freshwater, through whose instrumentality many an interesting fact in connection with the ornithology of the island was brought to the notice of naturalists. The outcome of this sojourn in the South of England was an important addition to Venables' 'Guide to the Isle of Wight,' in the shape of chapters upon the Zoology and Botany of the island, with systematic

* Mammals, Zool. 1844, pp. 776—790; Birds, Zool. 1844, pp. 516—524, 634—644; 1845, pp. 915—933, 970—978.

lists. These chapters (extending to more than a hundred small octavo pages) were issued separately, with a fresh pagination and a new title, as 'Outlines of the Natural History of the Isle of Wight.' Edited by A. G. More, F.L.S. London: Spottiswoode & Co., 1860.

In this publication there were not unnaturally errors, which subsequently-gained experience caused him to modify or correct, and this he did some years later in Jenkinson's 'Practical Guide to the Isle of Wight,' first printed in 1876. The lists of plants and animals given by him in this later work are different from those in Venables' 'Guide,' though founded apparently upon the same information. An important correction was that which had reference to the previously alleged occurrence of *Vespertilio murinus* in the island, the species in question having proved to be *V. noctula*. Another Bat, catalogued as Daubenton's Bat in Venables' 'Guide,' proved to be *V. mystacinus*. Both these errors were explained and corrected by himself in Jenkinson's 'Guide,' as well as in 'The Zoologist' (1894, p. 148).

Before either of these 'Guides' was published he had commenced to write in 'The Zoologist,' and in the volume for 1858 (pp. 6018—6027) we find an original communication (which must have given considerable trouble to prepare), "On the Distribution of Butterflies in Great Britain." This paper has probably been forgotten, and is even perhaps unknown to the younger generation of entomologists. It would be interesting to review it now by the light of present knowledge.

From the year 1860, when his observations on the fauna and flora of the Isle of Wight were published, we find him contributing at intervals not only to 'The Zoologist,' but also to the 'Phytologist,' and the 'Proceedings' of the Botanical Society of Edinburgh; and a little later we find papers, chiefly botanical, in the 'Journal' and 'Transactions' of the Linnean Society (of which he was elected a Fellow in 1856), the 'Annals and Magazine of Natural History,' the 'Journal of Botany,' the Dublin Society's 'Journal,' and the British Association 'Reports.' To 'The Ibis' for 1865 he contributed an important paper "On the Distribution of Birds in Great Britain during the Nesting Season," which proved extremely useful in paving the way for extended observations on this subject by other naturalists. Although a good zoologist, Mr. More appears to

have always found a greater attraction in Botany, and on going to reside in Ireland he at once began to pay serious attention to the flowering plants of that country, and ultimately became the highest authority on that subject. In 1866, in conjunction with Dr. David Moore, he published an excellent volume on the distribution of Irish plants, with the title, 'Contributions towards a Cybele Hibernica,' and for many years before his death he had in preparation a second edition of this work, which it is to be hoped may yet be completed by other hands.

In January, 1867, he was appointed assistant naturalist in the Museum of Natural History of the Royal Dublin Society, and when, in 1878, that museum was purchased by the Government, and became designated "The Science and Art Museum," his appointment in the Natural History department was confirmed. A few years later, namely, in 1881, on the death of the Director, Dr. Carte, the title of Curator was substituted for the post to which Mr. More was then appointed, and this position he accepted until 1887, when failing health compelled him to retire on a pension after twenty years' service. Two years prior to his resignation he issued a 'List of Irish Birds,' in connection with the collection in the Museum of Science and Art, and a second edition of this appeared in 1889. In the year in which his term of office expired he brought out a useful Guide to the Natural History Department of the Museum, a fitting termination to his public career. It is to be regretted that with his active mind and enforced leisure he had not sufficient energy remaining to utilise the materials he had collected for a new fauna and flora of Ireland. Some years ago, during an excursion to one of the islands on the West Coast of Ireland, he received a blow with a stone on the hip, which eventually resulted in disease of the hip-joint. From the time of his retirement he had to walk with crutches, and during the last year or two of his life he could only get about in a bath-chair. This did not deprive him, however, of the pleasure of receiving the friends who lived near him, and of corresponding with those who resided at a distance; and in this he found some alleviation of physical suffering. His last attack of bronchitis was brief, and in a few days the end came. His loss will be deplored not only by the friends in his adopted country, by whom he was regarded as a most trustworthy referee on all questions touching the Zoology and Botany of Ireland, but

by a large circle of readers personally unknown to him, who had learned to value his opinion, and regard him with an esteem which he well deserved.

NOTES AND QUERIES.

The Manuscript of White's 'Selborne.'—Messrs. Sotheby, Wilkinson and Hodge announce for sale by auction, on Friday, April 26th:—

“Lot 1069. WHITE (REV. GILBERT) OF SELBORNE.—The Natural History and Antiquities of Selborne in the County of Southampton.

. The Author's Autograph Manuscript of this famous and popular work in the form of letters to Thomas Pennant and Daines Barrington, first printed in 1789, and continually reprinted since. It comprises all the letters to Thos. Pennant (44); the first 62 (out of 66) of those written to the Hon. Daines Barrington; 12 pages of the 'Antiquities;' 1 leaf of Index; 1 leaf of 'More rare Plants observed in the parish of Selborne' (published in Bell's edition); a Poem entitled 'Selborne Hanger,' a winter-piece to the Miss Batties (1 leaf); and another, 'The Invitation: To Samuel Barker, By the Rev. G. White' (2 leaves in a different hand); 'On the sense of Hearing in Fishes,' 2 leaves headed 'Hints but not finished' (published only in Bell's edition); and a leaf intitled 'More Particulars of the old family 'Tortoise,' omitted in the Natural History. The manuscript contains many passages not printed in the several editions, and has never been out of the possession of the lineal descendants of the author. At the death of Gilbert White it passed into the possession of his brother Benjamin, who printed the first edition; from him to his son Benjamin; from the latter to his son the Rev. Glyd White, who bequeathed it to the father of the present owner. A few sheets of the MS. are written by an amanuensis, one of the author's family.”

Messrs. Sotheby & Co. will also sell in separate lots, on the same day and immediately following the "Lot" just described, eighteen autograph Sermons by the Rev. Gilbert White (Lots 1070—1087), written between the years 1747 and 1793 (the year of his death), and preached at Selborne and other places.

John Legg, of Market Lavington, Wilts, 1755-1802.—We are indebted to the Rev. A. C. Smith, of Old Park, Devizes, for a separate copy of a memoir, lately published by him in the 'Wiltshire Archæol. and Nat. Hist. Magazine,' of John Legg, whom he styles an advanced ornithologist of the 18th century, and whose memory until now has lain in oblivion. For this neglect, it must be said, he himself was chiefly to blame; for had he placed his name upon the title-page of his book instead of writing under

the pseudonym "A Naturalist," he would have received long before his death due acknowledgment of its merits. The book to which we refer is 'A Discourse on the Emigration of British Birds; or, this question at last solv'd: whence come the Stork and the Turtle, the Crane and the Swallow, when they know and observe the appointed time of their coming? Containing a curious, particular, and circumstantial account of the respective retreats of all those Birds of Passage which visit our Island at the commencement of spring and depart at the approach of winter, &c., &c.' This book, first printed in 1780, went into a second edition the same year, and was reprinted in 1795, and again in 1814 with a new title-page, when for the first time the name "George Edwards" was substituted for "A Naturalist." This, as Mr. A. C. Smith has shown, was only a rash guess on the part of the publisher, and a very mistaken guess. The real author's address, "Market Lavington, Wilts," being printed at the end of the Introduction, gave a clue to his identity, and, following this up, Mr. A. C. Smith has established the fact that the writer was John Legg, who (as appears by a marble tablet erected to his memory in the chancel of Market Lavington Church) was "the son of Richard and Jane Legg of this town," and "departed this life April 5th, 1802, aged 47." Further biographical details are given in the memoir now before us. Those of our readers who possess editions of the 'Discourse,' either with or without the name of George Edwards on the title, will be interested in this discovery of its real authorship.

MAMMALIA.

Irish Names for British Animals.—In the list of names for the Mole given by Prof. H. A. Strong (p. 11), I was surprised to find Irish names for an animal not known to exist in Ireland, namely, *caochán* (the blind creature), *criadh-luch* (the earth mouse), and *luch dall* (the blind mouse). It seems to me that to whatever animal these may refer they cannot be applied to one which is not a native of Ireland. I would suggest that they may have been given to the Long-tailed Field Mouse, and to the Lesser Shrew, with its diminutive eyes; the first and third named to the Shrew, the second to the Field Mouse.—ROBERT WARREN (Moyview, Ballina, Co. Mayo).

[This argument is fallacious, as may be seen if we consider the number of species to which English names have been applied in various parts of the world, and yet none of which are indigenous to England. Moreover, the Mole is by no means an isolated instance as regards Ireland; for example, there is no evidence, historical or geological, that the Roebuck was ever a native of Ireland, and yet there is an Irish name for it, *Earbóg*, which it may be observed closely resembles the modern Gaelic *Earb*, *Earba*, and *Earb-boc* ('Essays on Sport and Natural History,' pp. 52—55). The pheasant, *pheasan*, is mentioned in an *Irish* MS. poem of the ninth century as having been brought from the neighbourhood of Loch Melvine,

Co. Fermanagh, and offered with other birds and beasts by way of ransom for an Irish chieftain who had been taken prisoner (Wilde, Proc. Roy. Irish Acad., vol. vii. p. 187); and yet this bird, of course, was not indigenous to Ireland, and the date of its introduction there was probably much later. ('Essays,' pp. 305—307, 309).—ED.]

The Names of the Mole.—I cannot find that *Marsvin* (p. 104) is actually used as a name for the Mole in any part of Denmark, and must therefore regard its being given as a synonym in the dictionary as a mistake, and the "*mar*," as Mr. Cocks rightly argues, must refer to the sea alone. There is another small mammal, however, which is called a "Moor-pig" in Denmark, that is the Water-vole, *Mose-gris*, and one would suppose that the Mole has a better title to be called a Pig than the Vole. The latter half of this name for the Vole is also the Lowland Scots for a Pig—*grice*. [Compare also the Old English name for the Badger, *viz.* Gray—French, *gris*.—ED.] The Swedish for the Mole is, as Mr. Cocks points out, *Mullvad*, but its last syllable bears very little resemblance to the Scottish Moudie-(warp). Swedish is no doubt closer to Old Norse than is the Dano-Norwegian, but Lowland Scots is much nearer Dano-Norwegian than Swedish, and is nearest of all to the Jutland dialect.—HAROLD RÆBURN.

Irish Hare turning White in Winter.—I acknowledge that the statement made by me, and referred to in Major-General Warrand's note (p. 104), is not quite correct. I should have added—"The Mountain Hare remains *generally* in its brown summer fur throughout the winter." In making the statement I was guided chiefly by the experience of my friend Mr. Williams, of Dublin, who tells me that he has received as many as forty Hares in a winter from all parts of Ireland. His experience extends over a period of about twenty years, and he remarks to me:—"So far as I have seen, there is no change in the colour of the Hare in most winters, except in the event of the cold setting in very early." He received no white Hares during the late very severe winter, when the cold only set in after Christmas. The whitest Hare he has ever seen is a specimen in the Dublin Museum from Co. Wicklow. This, however, is by no means white all over, the whole back and head retaining the brown summer fur. If both he and I should prove to be mistaken, and the Mountain Hare really does turn as white in Ireland as it does in Scotland, the best way to settle the question once for all would be to send a white specimen to the Dublin Museum for future record.—R. F. SCHARFF (Science and Art Museum, Dublin).

[The authorities at the British Museum (Natural History) would, doubtless, also be glad to receive specimens of white Hares from Ireland for the National Collection. The evidence of Mr. Williams is good enough, so far as his experience goes, but so also is that of Major-Gen. Warrand, who states that "near Downpatrick, Co. Down, a very large number of Hares are taken or killed every year, and a considerable number of these turn very

white in winter, while nearly all assume a much lighter shade of fur when the cold weather sets in." This view is supported by the observations of Mr. T. E. Davies in Co. Donegal, by Col. J. Whyte in Sligo, by the late Lord Clermont in the counties of Armagh and Louth (Zool. 1882, p. 107), and by other correspondents in other parts of Ireland. Mr. Harvie Brown has an interesting and confirmatory note on this subject in his 'Vertebrate Fauna of Argyll,' p. 43, footnote.—ED.]

Yellow-tailed Squirrels.—In my note under this heading in the last number of 'The Zoologist' (p. 103), by a slip of the pen, "November" was given as the date when the new blackish hairs grow up and supersede the bleached white ones of the summer pelage. This should have been "September," by the middle of which month the majority of specimens have grown their winter tail hairs and dropped their summer ones.—**OLDFIELD THOMAS** (Natural History Museum, South Kensington).

BIRDS.

The Ruff in Sussex in Winter.—The appearance of a Ruff, *Machetes pugnax*, in Chichester Harbour during the first week of February last, seems to me sufficiently unusual to deserve mention. As a rule, this bird is a spring and autumn migrant in Sussex, appearing in the tidal harbours and estuaries about the end of April and beginning of May (when Knots, Whimbrel, and Grey Plover also arrive), but passing on northwards in about a week or ten days, not to reappear until the autumn, when, on the return journey south, they once more appear in larger flocks, no doubt because young and old are then associated. Years ago (in the sixties and seventies), before Pagham Harbour, that paradise for wildfowl and waders, was reclaimed, I was often quartered on that part of the coast for a week or two at a time in spring and autumn, taking note of all the birds that made a temporary stay there, as well as in the harbours of Bosham and Chichester. Lying out in a gunning-punt all day, walking round the harbour under the sea-wall, exploring the marshes between Sidlesham and Selsea, or tramping along the great pebble beach between Selsea Bill and the coast-guard station at Pagham, I became in this way familiar with all the ordinary wading and swimming birds, and some of the rarer ones too, learning to distinguish them by their notes, flight, and actions at a distance, stalking and shooting those about which any uncertainty existed, or by imitating their calls from an ambush, luring them round within shot, and securing those I wanted. In this way I got to know a good deal about the movements of the migratory species, the dates of their arrival and departure, and their relative abundance or scarcity. The Ruff I never found to be a common bird in Sussex, that is, by comparison with the Knot, Redshank, Bar-tailed Godwit, Curlew Sandpiper, Curlew, Whimbrel, and Grey Plover, which often appeared in great flocks at the period of their migration, together with Ringed Plovers

and Dunlins, the last-named sometimes in hundreds, it might almost be said in thousands, for their number was incalculable. On the spring migration the male Ruffs passed before they had completely assumed the curious frill and striking plumage which characterize them in the breeding season. There was then merely an indication of the colour which the frill would ultimately assume; black or yellow or reddish brown feathers, as the case might be, cropping out here and there about the sides of the neck and breast. In autumn, on their return journey, all traces of this had disappeared; the male birds, but for their larger size, were scarcely distinguishable from the females, or Reeves, and they arrived in what might be termed little family parties rather than in flocks like other waders. By the end of September they were gone, and it was very unusual to meet with any of these birds in winter, though occasionally a solitary Ruff might be detected with the field-glass feeding amongst Knots or Redshanks. But, as a rule, they consorted only with those of their own species. In February last, however, as I learn from my old friend the Rev. Prebendary Gordon, Vicar of Harting, a Ruff was shot in Chichester Harbour, by Mr. Edward Johnson, of Chichester, and was identified for him at the Natural History Museum at South Kensington.—J. E. HARTING.

The Little Auk on the West and East Coasts of Scotland.—At a meeting of the Natural History Society of Glasgow, held on March 26th, Mr. John Paterson read a paper entitled "Notes on the irruption of Little Auks, *Mergulus alle*, L., in the winter of 1894-5, on the West of Scotland, Oban to Ayr," in which he had carefully gathered up all the known facts in connection with the recent presence of these birds on this side of Scotland. The circumstances specially drawn attention to were (1) that none of the birds had been reported as seen in the Outer Hebrides or on the north-west coast of Scotland; (2) that, so far as known, there had been none seen in Ayrshire; (3) that the occurrence throughout the Clyde faunal area had been of a very scattered character; and (4) that the birds had been in greatest abundance between Oban and Islay—that is in line of the great glen from Inverness south-westwards, by which route, in Mr. Paterson's opinion, the birds had arrived from the east coast.

It would seem from a more elaborate paper by Mr. W. Eagle Clarke, "On the Recent Visitation of the Little Auk to Scotland," published in the 'Annals of Scottish Natural History' for April (pp. 97-108), with a map, that these conclusions require some modification. Thus (1) in the Outer Hebrides this bird was observed in Lewis and Barra; (2) several were noted in Ayrshire; and (3) many on the east side of the Firth of Clyde. On the other hand, Mr. Clarke's map does not illustrate Mr. Paterson's statement (4) that the birds were found in greatest abundance between Oban and Islay.

Local Names for Wildfowl.—"Pijlstaart" (p. 106) is common Dutch for Pintail, just as its diminutive "Pijlstaartje" is for the Long-tailed Titmouse; but I believe the former is also applied by Dutch sailors to birds of the genus *Phaethon*, and hence the Pylstaart Island, or Islands, of our maps. "Pellstart" would of course be an English rendering of the word in its first signification, though perhaps it would be more appropriately written "Pilestart." *Pilet*, which M. Rolland explains to be *petit javelot*, *petite flèche*, is the form it takes in French, while *Pfeilschwanz* is the German equivalent. I have included Pylstaart in my 'Dictionary of Birds,' as apparently applied originally to the long-tailed Skuas, but without referring to it as a name for the Pintail, which I ought to have done, as its application in that sense is probably the oldest. I may add that "Pilestart" is given by Giraud ('Birds of Long Island,' Index, p. 396), with a reference to "Pintail." The Dutchmen who settled what is now New York may have taken it over, or it may have been a good English name, only one that did not happen to find its way into print until after its arrival in America, as seems to have been the case with "Oystercatcher."—ALFRED NEWTON (Magdalene College, Cambridge).

Distribution of Pomatorhine Skua in Summer.—The following observations on the summer distribution of the Pomatorhine Skua in parts of the North Atlantic and Greenland Seas refer to a voyage made by me last year. On June 30th, between Bear Island and the South Cape of Spitsbergen, in about lat. $75^{\circ} 10'$, an adult *Stercorarius pomatorhinus* came within thirty yards of the yacht. During the following ten days, passed on the shores and waters of Western Spitsbergen, I did not observe this species. Its rarity on the western side of Spitsbergen has been referred to by Professor Newton and others, though the Rev. A. E. Eaton found them in numbers during August in Hinlopen Straits, and off Low Island, on the north of Spitsbergen. During the return to Norway, I saw nothing of this species, though Professor Newton remarks that he saw them in numbers between Bear Island and Tromsø in the latter part of the month of August. Still later in the year it was found equally plentiful by Dr. Malmgren in much the same latitude. On July 15th we were steering a course from Røost Lighthouse, on the south-western islet of the Loffodens, for Fuglo in Færøe. In long. 11° E., and in about lat. $66^{\circ} 40'$ N., Fulmars, which do not seem to frequent the inland waters of the Norwegian fiords, appeared in some numbers, and with them Pomatorhine Skuas. The weather was lovely, and we were running under steam and with all square sail set. During July 16th and 17th we kept our course, and my log for these two days reads:—"Only Fulmars and a few Pomatorhine Skuas accompanying us, several of the latter in full adult plumage, showing conspicuous twisted tail-feathers." Early in the morning of July 18th, Fuglo was sighted through the gloom. Fulmars and the usual rock-birds and Gulls of the

Færøes became numerous, but we had parted with the Pomatorhines, and none followed us beyond sight of those islands. Leaving Thorshavn on the morning of July 19th, our course was laid to pass a little to the westward of Foula. When we had left the Færøes some forty miles behind us, numbers of Pomatorhine Skuas constantly came close to the ship, as many as eight or ten being around us at the same time. The majority were birds in immature plumage, but several were fine old adults. About 11 p.m. we had a glimpse of Foula through the haze and gloom, but some hours before that the Fulmars, which had been our companions for twenty degrees of latitude, bade us farewell; nor did we see any more of the Pomatorhines. It seems to me that this oceanic distribution of *S. pomatorhinus* during summer is an interesting fact in the life-history of the bird. I do not suppose that the Pomatorhines we met with in the North Atlantic, between the Loffodens and the Færøes, in the middle of July, were birds returning south on migration. The majority of these birds were immature, and it may be that, having no breeding instincts to fulfil, the young of this species pass the summer months in scouring the ocean. Why adult birds should accompany them when we might expect these to be at their breeding-quarters is not so easy to account for. Why does this species absolutely avoid the Færøes in summer, for I never heard of an example being procured there except in autumn or winter? and why should it be abundant in July between the Færøes and the Shetlands, and only known from the latter islands by a few examples procured in winter? We know that this species obtains its food partly by robbing Gulls and Terns, but in that great spread of water between the Loffodens and the Færøes I did not see a single Gull or Tern for the Pomatorhine Skua to rob. Under such circumstances on what does it subsist?—H. W. FEILDEN.

SCIENTIFIC SOCIETIES.

LINNEAN SOCIETY OF LONDON.

March 7th, 1895.—Mr. C. B. CLARKE, F.R.S., President, in the chair.

Mr. A. Henry was admitted a Fellow.

On behalf of Sir Joseph Hooker, the Secretary exhibited a bronze medal struck in honour of the late Alphonse de Candolle.

Mr. J. E. Harting exhibited a remarkable head and horns of *Capra ægagrus*, recently obtained by Mr. F. C. Selous in Asia Minor, and made remarks on the geographical distribution of this and other allied species.

Mr. G. F. Scott Elliot, who had been absent from England since Sept. 1893, on a botanical exploration of Mount Ruwenzori and the country to

the north of the Albert Edward Nyanza, gave an account of his journey and of the results, geographical, botanical, and zoological, obtained by him. The country lying north-east of the Victoria Nyanza was described as a large rolling grassy plain, some 6000 feet above sea-level, and well adapted for colonization. He went west from the Victoria Nyanza to Mount Ruwenzori, which is said to have an altitude of 18,000 feet, and spent four months in exploring that district, under the great disadvantage of a dense cloud hanging over the mountain the greater part of the day, which often prevented the party from seeing more than fifty feet ahead. The sides of the mountain were clothed at the base with a thick growth of trees resembling the laurel of the Canary Islands; above that bamboos to the 10,000-foot level; and above that again what the explorer could only liken to a Scotch peat-moss, in which the traveller sank at every step a foot or more. Large trunks, like those of *Erica arborea* of the Canary Islands, but indicating trees eighty feet high, were noticed. Amongst other plants found were a *Viola*, a *Cardamine*, a gigantic *Lobelia* attaining a height of five or six feet, and a species of *Hypericum* resembling that found in the Canaries; indeed the similarity of the flora to that of the Canary Islands was remarkable. Mr. Scott Elliot ascended Mount Ruwenzori to the height of 13,000 feet, finding evidence of animal life and numerous insects to a height of 7000 feet. Above 10,000 feet his Swahili porters could not sleep without injury to their health, and it was only with a reduced number of men that he was able to ascend another 3000 feet. Amongst the animals specially mentioned was a species of Water-buck (*Cobus*), a Baboon, two species of Monkey, one black and white, the other with short slate-coloured fur, a new Chameleon, a new snake, and several new insects. The commonest birds were Sun-birds (*Cinnyridæ*), one species of which—green, yellow, and crimson—was found at an altitude of more than 10,000 feet. The paper was criticised by Mr. Carruthers and others.

The Secretary then read an abstract of a paper by Dr. Maxwell T. Masters on the genus *Cupressus*, illustrated by a number of plants and cuttings which had been forwarded by Messrs. Veitch, Mr. Moore, of Glasnevin, and Dr. Acton, of Kilmacurragh.

Dealing with the zoological collections made during the recent expedition of Mr. Theodore Bent to Southern Arabia, Messrs. Kirby, Gahan, and Pocock communicated papers on the Insects and Arachnida which had been obtained, and some of which were described as new.

March 21st.—Mr. C. B. CLARKE, F.R.S., President, in the chair.

Messrs. Rudolf Beer and W. H. Heathcote were elected Fellows.

Professor Stewart exhibited and made remarks upon a series of Corals, dwelling upon certain characteristic features which illustrated their structure.

Mr. S. Pace brought forward a collection of shells belonging to the genus *Columbella*, and made some observations concerning the peculiarities and geographical distribution of some of the species exhibited.

A paper was read by the President "On the terminal flower in the *Cyperaceæ*." After remarking that this order had been newly arranged by Dr. Pax in Engler's 'Jahrbuch' (1886), and in Engler and Prantl's 'Pflanzenfamilien,' the character taken for primary division of the order being the inflorescence, he considered that the classification advocated proved either that the modern method pursued by Dr. Pax was of limited systematic value, or that he had erred considerably in his ascertainment of the fact whether in each genus the flower is terminal or not. Mr. Clarke exhibited his own analysis of the spikelet in the larger genera in dispute. He held that in *Carex*, *Scleria*, and their allies, the flower, male and female, was strictly axillary; that in *Rhynchospora* it was axillary—exactly as in *Dichromena* and *Psilocarya*—while in *Hypolytrum* the flower is terminal, exactly as in *Mapania*. He further maintained that these facts could be sufficiently shown by the aid of a penknife and pocket-lens, and that no results which might be hereafter obtained by studies in development could affect the weight to be attributed either to the character of the "terminal flower" or to the real affinities of the genera. The paper was illustrated by lantern-slides showing dissections, and a discussion followed in which Sir D. Brandis, Mr. A. B. Rendle, Dr. Prain, and Dr. D. H. Scott took part.

Dr. H. Field, of New York, then made some remarks on the proposed establishment of a central international bureau for zoological bibliography, and the annual publication of an international Zoological Record.

ZOOLOGICAL SOCIETY OF LONDON.

March 5th.—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, and called special attention to a fine Giraffe recently arrived from South Africa. This was believed to be the first example of the large, dark-blotched race ever seen alive in Europe, the Giraffes previously exhibited having belonged to the smaller and paler form found in Northern Tropical Africa. The Society had also purchased a pair of Sable Antelopes, *Hippotragus niger*, and a pair of Brindled Gnus, *Connochætes taurina*, all in excellent condition.

The Secretary exhibited, on behalf of Mr. Walsey, of the Hudson's Bay Company, two Martens' skins which had been received from two districts widely apart. The peculiarity in these skins consisted in the fact that one of the fore legs in each skin was wanting, and there was nothing to indicate that a limb had ever existed at that part.

Dr. St. George Mivart read a paper on some distinctive structural characters in the hyoid bone in certain Parrots. He represented two lateral processes of the basihyal (for which he proposed the name "parahyal processes") as probably distinctive of the whole of the *Psittaci*. He found that in the genera *Lorius*, *Eos*, and *Trichoglossus* these processes were developed into a remarkably delicate parahyal arch. He also described the hyoid of *Stringops*, showing that it was completely Psittacine, but with some special characters probably peculiar to it.

Mr. A. D. Michael read a paper on a new freshwater Mite found in Cornwall, and belonging to the genus *Thyas*, of which only two species were previously known. It is a very handsome species, flattened in form, scarlet and orange in colour, and with remarkable whorls of large lanceolate spines tipped with scarlet on the legs. It was found near the Land's End in a small stream close to where the rapid water falls into the sea. He proposed to name it *Thyas petrophilus*.

Mr. G. A. Boulenger read a paper "On the Nursing-habits of two South-American Frogs," and exhibited a specimen of *Hyla goeldii* with the eggs on the back. He also made remarks on a male specimen of *Phyllobates trinitatis* from Venezuela, carrying its tadpoles on its back, in the same way as had previously been observed in frogs of the genus *Dendrobates* from Surinam and Brazil.

March 19th.—Sir W. H. FLOWER, K.C.B., LL.D., F.R.S., President, in the chair.

Lieut.-Col. Godwin-Austen and Mr. W. E. Collinge communicated a paper on some new species of Mollusca from Borneo. Three new species were described, and details were given of their structure and affinities.

Mr. F. E. Beddard read a preliminary account of some new Earthworms in the Hamburg Museum, collected in South America.

Prof. Alphonse Milne-Edwards communicated the description of a new species of Crab of the genus *Hyastenus*, obtained near the Straits of Magellan during the 'Challenger' Expedition, and proposed to be named *H. conso-brinus*.

Dr. A. G. Butler gave an account of two collections of Lepidoptera received by the British Museum; one from Zomba, made by Mr. J. McClounie, remarkable for the number of butterflies of the genus *Charaxes* it contained; the other made at Fwambo, Lake Tanganyika, by Mr. Alexander Carson, including not only rare species previously received only from Zomba and Lake Mweru, but several novelties, the finest of which was *Junonia pavonina*, a new form allied to *J. artaxia*.

Mr. F. Chalmers Mitchell read a paper in which he described the proventricular crypts he had found in a specimen of the African Tantalus, *Pseudotantalus ibis*, recently living in the Society's Gardens. — P. L. SCLATER, Secretary.

ENTOMOLOGICAL SOCIETY OF LONDON.

March 6th.—Professor RAPHAEL MELDOLA, F.R.S., President, in the chair.

The following were elected Fellows of the Society:—Messrs. H. T. Dobson, Herbert Massey, Thomas M. McGregor, Sidney Crompton, B. H. Crabtree, and G. A. K. Marshall.

Mr. B. G. Nevinson exhibited a series of *Heliothis peltigera*, bred from larvæ found on the Dorsetshire coast during July, 1894, feeding on the flowers of *Ononis arvensis*; a few also were taken on *Hyoscyamus niger*. All the larvæ went down by the end of July. The first emergence took place on August 20th, and they continued coming out at the rate of about five a day through the rest of that month and September; only five emerged in October, and the last on Nov. 11th.

Mr. Bower exhibited a variable species of *Scoparia basistrigalis*, Knaggs, showing light, intermediate, and dark forms, taken at Bexley, Kent, from June 12th to July 7th, 1891–94.

Lord Walsingham exhibited larvæ of *Pronuba yuccasella*, which he received more than four years ago from Colorado, and which were still living. One specimen of the moth had emerged two years ago.

Mr. Goss exhibited, for Mr. G. C. Bignell, a pupa of a Tortrix with the larval legs, and also a specimen of a sawfly, *Emphytus cinctus*, L., with eight legs.

Professor Meldola exhibited a wooden bowl from West Africa, from which, after arrival in this country, a number of beetles (*Dermestes vulpinus*) had emerged. Specimens of the latter were also exhibited. It was generally considered that the larvæ excavated the wood for the purposes of pupation, and not for food.

Mr. Champion read a paper "On the Heteromerous Coleoptera collected in Australia and Tasmania by Mr. J. J. Walker, R.N., during the voyage of H.M.S. 'Penguin,' with descriptions of new genera and species," Part II.

Mr. Roland Trimen contributed a paper "On some new Species of Butterflies from Tropical and extra-Tropical South Africa."

Mr G. A. James Rothney contributed "Notes on Indian Ants," and sent for exhibition a number of specimens in illustration of the paper, together with nests of certain species.

March 20th.—Professor RAPHAEL MELDOLA, F.R.S., President, in the chair.

Messrs. Claude Morley, Herbert E. Page, W. W. Smith, and Henry Tunaley were elected Fellows of the Society.

Mr. H. St. John Donisthorpe exhibited a living female of *Dytiscus marginalis* with elytra resembling those of the male insect. Dr. Sharp said

he had seen this form before, but that it was very rare in this country, though abundant in some other parts of the palæartic region.

Dr. Sharp exhibited specimens of *Brenthus anchorago*, from Mexico, showing extreme variation in size.

Mr. Blandford commented on the difficulty of mounting minute Lepidoptera, Diptera, Neuroptera, &c., and exhibited samples of strips of material which he had found most suitable for the purpose of staging minute insects. His attention had been called to this method of mounting by the receipt of specimens from Dr. Fric, of Prague. On examination of the material he found it to be a fungus, *Polyporus betulinus*. Lord Walsingham had expressed his satisfaction with this material, and had sent him specimens, similarly mounted, from Zeller's collection. Mr. McLachlan thought the material exhibited preferable to artichoke-pith, which had been used for a similar purpose.

Mr. Goss exhibited a species of Mantid, *Pseudocreobotra wahlbergi*, Stål, received from Captain Montgomery, of Mid-Ilovo, Natal.

Mr. Frederick A. A. Skuse communicated a paper "On a Colour Variety of *Heteronympha merope*, Fab., from New South Wales," and sent coloured drawings of the typical form and the variety for exhibition.

Mr. Oswald H. Latter read a paper, illustrated by the oxy-hydrogen lantern, entitled "Further Notes on the Secretion of Potassium Hydroxide by *Dicranura vinula* (imago) and similar Phenomena in other Lepidoptera." Professor Meldola congratulated Mr. Latter on the thorough way in which he had worked out his experiments, and for the first time proved the secretion of free potassium hydroxide in the animal kingdom.

Mr. Merrifield read a paper entitled "The Results of Experiments made last season on *Vanessa c-album* and *Limenitis sibylla*." This was illustrated by an exhibition of specimens of *L. sibylla*, and a long series of *V. c-album*, to show the effect of temperature in producing variation. In connection with Mr. Merrifield's paper, Mr. F. W. Frohawk exhibited a series of 200 specimens of *V. c-album* bred from one female taken in Herefordshire in April, 1894. The series consisted of 105 males and 95 females, and included 41 specimens of the light form and 159 of the dark form. Professor Meldola was glad to think that the subject of seasonal dimorphism, which had been first investigated systematically by Weismann, was receiving so much attention in this country. He was of opinion that the results hitherto arrived at were quite in harmony with Weismann's theory of reversion to the glacial form, and all the evidence recently accumulated by the excellent observations of Mr. Merrifield and others went to confirm this view as opposed to that of the direct action of temperature as a modifying influence.—H. Goss, *Hon. Secretary*.

NOTICES OF NEW BOOKS.

Summer Studies of Birds and Books. By W. WARDE FOWLER.
8vo, pp. 288. London: Macmillan & Co. 1895.

MR. FOWLER'S 'Year with the Birds,' reviewed in this Journal some years ago (Zool. 1887, p. 316), will be familiar to most of our readers, and we are not surprised to find that a third edition of it has lately appeared. In the present volume we have a fresh series of similar essays, breathing of that love of Nature and appreciation of the labours of other naturalists which characterised his former book. In *that* we remember an essay on Virgil's natural history lore; in *this* we find an essay on Aristotle's knowledge of birds, and, for those who have never been at the pains to study the original, a very instructive essay it is. Mr. Fowler, of course, is not the first modern writer who has published remarks on this subject. Thirty years or more ago Prof. Sundevall, well versed in Greek, and with an extensive knowledge of zoology, gave to the world an admirable treatise in his 'Thierarten des Aristotles' (Stockholm, 1863), and, naturally, Mr. Fowler has not omitted to consult it. The result of his research is full of interest. Aristotle's acquaintance with the general facts of bird-life, though in some respects curiously accurate, was on the whole very imperfect. He no doubt had many opportunities of procuring specimens, both alive and dead, in the bird-market at Athens, and also of obtaining information on various points from the bird-catchers who brought them thither for sale. But, as Mr. Fowler puts it, his book was "a collection of odd bits of unsifted information, so far as it relates to living birds; his real interest lay rather in investigating the organs of animals by dissection." There is, as the late George Henry Lewes long ago remarked, a want of "out-of-dooriness" about his book, which breathes not of the fields and streams. He was neither a sportsman nor a field-naturalist. Hence it is not surprising that his work does not bear many traces of careful observation, although, as Mr. Fowler points out, there are here and there passages which are of interest to naturalists even now. His remarks, for example, on migration, on the supposed hybernation of certain species, on seasonal change of colour, and on the classification of birds according to the nature of their food, are very striking for the age in which they were made.

Mr. Fowler's chapter on Gilbert White of Selborne appears to us less opportune at the present moment than when written to remind his readers of the approaching centenary anniversary of that author's death. It falls just a little flat, because we have so recently been reminded, in other words, of much which he has now reprinted.

In his chapter "On the Songs of Birds" we have something fresher, and his appendix "On the Vocal Organs of Singing Birds" (with a plate) embodies the most scientific portion of the book. The quality which Aristotle did not possess—out-of-door observation—is Mr. Fowler's *forte*; and whether we accompany him to the Engstlen Alp, wander with him through the wilder parts of Wales, or be seated upon the grassy slope of Bindon Hill, where the air is sweet with thyme, to view below us the grey and misty sea washing the base of the Dorset downs, we enjoy the companionship of an intellectual guide who has always something of interest to impart.

Catalogue of the Birds of Prey (Accipitres and Striges); with the number of Specimens in the Norwich Museum. By J. H. GURNEY. 8vo, pp. 56. London: R. H. Porter. 1894.

SINCE the death of the author's father in April, 1890, a good many additions have been made to his 'List of the Diurnal Birds of Prey.' From Mr. Reeve's MS. Catalogue of the species in the Norwich Museum, and from notes in the late Mr. Gurney's interleaved copy of his own work, as well as from 'The Ibis' and other sources of information, Mr. J. H. Gurney has now completed and issued a volume with the title given above, which we have no doubt will be found extremely useful. In addition to the revised lists of *Accipitres* and *Striges*, there is also a list of Mr. Gurney's principal papers on Raptorial Birds in order of date, one of which, for convenience in regard to size and consequent accessibility, is reprinted from the quarto pages of the 'Transactions of the Zoological Society,' 1865.

As a frontispiece we find an admirable likeness of the late Mr. Gurney, and the volume is further illustrated with two double-page charts, showing the respective distribution of the *Vulturidæ* and of the genus *Scops*, the largest and most universally distributed genus of any in the order *Striges*.

THE ZOOLOGIST

No. 221.—May, 1895.

THE MAMMALIAN FAUNA OF CHESHIRE.

BY T. A. COWARD AND CHARLES OLDHAM.

THE following paper makes no claim to be an exhaustive treatise on the existing Mammalia of Cheshire, but is merely a summary of our present knowledge of the subject. It has been written mainly in the hope that the facts therein recorded may induce other observers to co-operate with the writers in the compilation of such a list of the vertebrates of the county as shall be of practical utility to resident naturalists, and not without interest to all students of this section of the British fauna.

Cheshire is a maritime county in the West of England, separated from Lancashire on the north by the river Mersey and its tributary the Tame; from Yorkshire in the extreme north-east by the ridge of hills which forms the watershed of the Mersey and Yorkshire Ouse; from Derbyshire and Staffordshire in the east by the rivers Etherow, Goyt, and Dane, tributaries of the Mersey; and from Flintshire and Denbighshire on the south-east by the Dee. The county is bounded on the south by Shropshire and parts of Staffordshire and Flintshire, but the borderline is not a natural one.

The greater part of the county, which has a total area of 1102 square miles, is an extensive and nearly level plain which rests upon the New Red Sandstone, and is seldom more than from two to three hundred feet above the sea-level. Here and there, however, the older Triassic rocks rise abruptly from the surrounding red marl, and attain an altitude of over 500 ft. at Beeston Castle, Eddisbury, and Harrol Edge, near Frodsham,

and 604 ft. at Alderley Edge. Except in the neighbourhood of the few manufacturing towns, the Cheshire plain now presents a peaceful pastoral aspect, extensive grazing and dairy tracts, which are among the most important in England, being interspersed with numerous game-coverts and large well-timbered parks; the heaths and peat-mosses have been almost entirely reclaimed, and the Royal Forest of Delamere, between Northwich and Chester, alone remains of the extensive natural woodlands which once covered the greater part of its surface. The whole country is well watered by the Bollin, Dane, Weaver, and Gowy, which flow into the Mersey, and is studded with numerous small lakes or meres, of which Rostherne, Tatton, Doddington, Budworth, and Combermere may be cited as examples; whilst nearly every field contains one or more marl-pits, which formerly constituted the sole source of the manure-supply for the permanent pastures. In the north-western part of the county, between the estuaries of the Dee and Mersey, is a hammer-headed peninsula, called Wirral, whose natural features do not differ materially from those of the central plain.

In the east and north-east the character of the country is entirely different. The scenery in many places is very wild and romantic, and the hills of millstone grit, rising to 1833 ft. at Shining Tor, near Macclesfield, and to 1908 ft. at the head of Heyden Brook in Longdendale, with their long lines of terraced or steeply-scarped edges and broad stretches of breezy grouse-moor, form a striking contrast to the fertile and well-wooded plain of the Trias.

Of the literature of our subject there is but little to be said. The earliest work which contains more than a casual reference to any of the Mammalia is 'A Discription Historicall and Geographical of the Countie Palatine of Chester,' published at Chester in 1656. In speaking of Delamere and Maxfield Forests the author, Daniel King, says:—"Besides the great store of Deer both Red and Fallow, in the two Forests before named; there is also great plenty of Hares: In hunting whereof the gentlemen do pass much of their time, especially in Winter; also great store of Conies, both black and gray; namely in the places where it is Sandy ground; neither doth it lack Foxes, Foulmards, Otters, Basons,* and such like." Dr. Charles Leigh's 'Natural

* Bason, Bawson, and Boreson, *i. e.*, the Badger.

History of Lancashire, Cheshire, and the Peak of Derbyshire,' published in 1700, contains nothing of interest beyond a description of the Red Deer at Lyme, and a brief notice of the Fallow Deer in Dunham Park. In 1854 "The Fauna of Liverpool," by Isaac Byerley, was published as an appendix to the 'Proceedings' of the Liverpool Literary and Philosophical Society. The writer enumerates thirty-one species of mammals for Cheshire, exclusive of domesticated forms; and, although the records of two species—the Lesser Horseshoe Bat and the Harvest Mouse—can only be accepted with hesitation, the list contains much valuable information, and is interesting as the first attempt to give a detailed account of the mammals of even a portion of the county. Dr. J. D. Sainter's 'Scientific Rambles round Macclesfield' appeared twenty-four years later, and included a list of the birds, mammals, and reptiles of the neighbourhood. This list, however, contains many obvious inaccuracies, and is consequently of little practical value. An excellent list of the Seals and Whales of the Dee and Mersey estuaries, by the late T. J. Moore, is given in 'The Second Report on the Fauna of Liverpool Bay,' published in 1889 by the Liverpool Marine Biology Committee. The most recent list, and the only one which embraces the whole county, was contributed by Mr. R. Newstead to the 'Proceedings' of the Chester Society of Literature and Natural Science (No. iv. 1894) under the title of "A Preliminary List of the Mammals of Cheshire and North Wales." Mr. Newstead enumerates twenty-eight terrestrial species for Cheshire, but does not include the Seals and Cetaceans.

In addition to these lists there are many scattered records in 'The Zoologist,' 'The Naturalist,' 'The Field,' and the columns of 'The Manchester City News.' We have also consulted Bell's 'British Quadrupeds,' various works on local topography, and the 'Proceedings' of local scientific societies.

It remains to say that we have received valued help in the shape of notes and specimens from several correspondents, and we take this opportunity of tendering to them collectively our warmest thanks.

Before proceeding to consider the existing fauna we may briefly review what evidence we have of species which have disappeared during, or immediately prior to, the historic period. Owing to the absence of the limestone caverns, which have

yielded such a rich harvest of mammalian remains in the neighbouring counties of Derby and York, our knowledge of the ancient fauna is comparatively scanty, though it would probably be considerably extended by the investigation of old MSS. relating to the county—a field of research pertaining to the province of the antiquary rather than the naturalist,

There can be little doubt that the Wolf (*Canis lupus*) formerly abounded in the Cheshire forests, and its remains are of frequent occurrence in the superficial deposits of Wirral (A. Hume, 'Antiquities of the Cheshire Coast,' p. 350).

Skulls of *Bos primigenius* have been found in the peat-beds at Leasowe and Wallasey, and at various places in the bed of the Manchester Ship Canal. The smaller domesticated Ox (*B. longifrons*) was probably abundant. We have seen skulls from the peat-beds at Leasowe, the bed of the Mersey near Warrington, Chester, and several places on the line of the Ship Canal.

The forest recesses and the reed-beds fringing the meres afforded suitable covert for the Wild Boar (*Sus scrofa*), whose memory is preserved in the place-name Wild Boar Clough, near Macclesfield. Its tusks are of frequent occurrence near Roman stations (Hume, *op. cit.* p. 350), and some years ago a skeleton was dug up from a peat-bog at Mobberley (Wm. Norbury, 'Proc. Lanc. and Chesh. Antiquarian Society,' vol. ii. p. 65).

We have etymological evidence of the existence of the Roe-buck (*Capreolus capræa*) in Roelau, 'one of the hundreds into which the county was formerly divided; and in Domesday Book we read that at Wivreham (Weaverham) and Chingeslie (Kingsley), both in the hundred of Roelau, there were respectively one and four* hays for roes.

* The word *haia* is frequently mentioned in Domesday Book under the heading of Audlem, Wrenbury, Bredbury, Adlington, Worleston, &c.; but *haia capreolorum* occurs only in connection with Weaverham and Kingsley. The following explanation of the word is given by Beamont ('A Literal Extension and Translation of the portion of Domesday Book relating to Cheshire and Lancashire,' Introduction, p. xxxi):—"The word *hay*, in its original, is Saxon, and signifies a hedge, whence the quickset, its most frequent material, is a hawthorn, or, in our Lancashire vernacular, a *haythorn*. The transition was easy from that which enclosed to that which it enclosed, and so the latter naturally became a *hay*. The hays were chiefly made in the woods and forests, and, except such as were intended for the roe, were forbidden to be made of any great height; and they were so contrived

The forty-four species which now inhabit Cheshire, or visit its estuaries as stragglers, are divided into the following Orders:—

Chiroptera	...	...	...	7	species.
Insectivora	...	...	...	5	„
Rodentia	...	...	...	13	„
Ungulata	...	...	...	3	„
Carnivora	...	...	...	10	„
Cetacea	...	...	...	6	„

The Bats as a group have been greatly neglected, and further research will doubtless result in the addition of other species. Natterer's Bat (*Vespertilio nattereri*) has escaped attention hitherto. It has been recorded from South Lancashire (C. Oldham, Zool. 1893, p. 457), and its addition to the Cheshire fauna is probably only a question of time.

All the Insectivora and Rodentia included by Bell in his 'British Quadrupeds' occur in the county, but, owing to their small size and retiring habits, several of the species are often overlooked, and are probably more plentiful than is generally supposed.

Incessant war is waged by gamekeepers against the terrestrial Carnivora, while the Polecat and Marten are practically extinct. In the 'Manchester City News' for Nov. 3rd, 1883, the late J. F. Robinson described a cat which had been trapped some years previously in Delamere Forest, and which he considered to be a genuine Wild Cat; the evidence he adduces, however, hardly appears to warrant the inclusion of *Felis catus* among the Cheshire mammals. There is reliable evidence of the occurrence of three Seals, but we do not think that Dr. C. Collingwood was justified (Proc. Liv. Lit. Phil. Soc. vol. xviii. p. 162) in assuming that the pied Seal mentioned by Pennant ('British Zoology,' vol. i. p. 177), as having been taken near Chester in May, 1766, was an example of the Mediterranean *Monachus albiventer*. Pennant's description of the creature is too vague to admit of a satisfactory determination of the species.

that, at certain seasons, the deer could be driven into them to be taken or inspected, which was called a *stabilitio*, as the stand where the owner or sportsman stood was called a *stabilitura*. We never meet with these hays in places which are said to be waste. The *haia capreolorum* was a hay for roes, and a *dimidia haia* was half a hay, or a hay unfinished." For further notes on "Roe-deer hays," see Harting, 'Essays on Sport and Nat. Hist.' 1883, p. 41.

The Fallow Deer is included among the Ungulata, though it is known only as a park animal, and there is no evidence to show that it was ever really wild in this county.

Cetaceans entering the estuaries are frequently left stranded on the vast sand-banks which are exposed at low-water, but it is comparatively seldom that they come under the notice of competent naturalists; and other species than those recorded have probably occurred.

Order CHIROPTERA.—Family RHINOLOPHIDÆ.

Rhinolophus hipposideros (Bechst.); Lesser Horseshoe Bat.—Byerley has recorded the occurrence of a Lesser Horseshoe Bat at Storeton quarry, near Birkenhead, about the year 1834, but the record rests on the sole authority of a taxidermist named Mather, and requires verification.

Family VESPERTILIONIDÆ.

Plecotus auritus (L); Long-eared Bat.—This species is probably fairly plentiful throughout the county. Byerley describes it as “very common in the district”; Mr. R. Newstead says, “widely distributed throughout the district, but not so common as *V. noctula*,” and adds that he has frequently seen it hawking for flies in broad daylight during the warm days of early spring. It is common in the Mid-Cheshire district, and we have obtained specimens at Bowdon, Sale, Northen Etchells, Wythenshawe, and several times in the copper mines at Alderley Edge. Mr. T. D. Sykes informs us that he has frequently shot it on the Cheshire bank of the Mersey, near Cadishead, and the Rev. H. G. Barnacle states that it is not uncommon at Holmes Chapel. The choice of a diurnal resting-place by this bat is very varied. We have found it between the ceiling and roof of a cottage, in a timber-stack, in a crevice in the bark of a birch-tree, and Mr. A. Salmon, of Bowdon, has taken numbers from holes in beeches in Dunham Park.

Synotus barbastellus (Schreb.); Barbastelle.—There is a female specimen in alcohol in the British Museum labelled “Cheshire,” but no further data are given (G. E. Dobson, ‘Cat. Chiroptera in Coll. Brit. Mus.’ 1878, p. 177).

Vesperugo pipistrellus (Schreb.); Pipistrelle.—Probably generally distributed and common. Byerley describes it as the “most

common bat in the district," and Mr. Newstead also states that it is the commonest species. Personally we have only obtained the Pipistrelle in Dunham Park, where it is abundant. It appears about the same time in the evening as the Noctule, and generally flies low under the trees, although Coward has shot it flying round the tops of high beeches.

V. noctula (Schreb.); Noctule; Great Bat; Fox Bat.—Probably common wherever there is old timber. Byerley states that "Mr. Mather remembers having stuffed specimens taken from Birkenhead Abbey many years ago, before the additional building. Once or twice from other localities. If now in the neighbourhood it is very scarce"; but Mr. Newstead says it is "common and generally distributed." There is a specimen in the Grosvenor Museum, Chester, from Manley, dated 1889. We have seen Noctules on the wing at Lymm, Hatchmere, Mouldsworth, Higher Peover, and Capesthorpe, and have obtained specimens from Timperley, Knutsford, and Dunham Park. In this last locality, where it is exceedingly plentiful, it spends the day in the cavities of the old oaks, which abound in the park, and usually leaves these resting-places about forty minutes after sunset. At first these bats fly very high, squeaking and chasing one another around and above the tree-tops. During summer they frequent the open glades, generally flying high; but towards the middle of September they resort in great numbers to the water-meadows by the river Bollin, flying up and down alongside the park-wall, often not more than ten or twelve feet from the ground. When shooting at them they will often suddenly dart down and almost touch the muzzle of the gun. On dissecting two Noctules which Mr. G. O. Day sent us, taken from a house-roof in Knutsford on March 19th, 1894, we found a mass of half-digested beetles and flies in their stomachs, from which it was inferred that they had been recently on the wing. In Cheshire we have not seen this species later than Sept. 18th, though Coward has observed it in Derbyshire on the 22nd of that month, and in Surrey on Oct. 1st.

Vespertilio daubentonii, Leisler; Daubenton's Bat.—Occurs in several localities, and is probably generally distributed. Byerley states that nine out of two or three dozen were taken by Mr. Nicholas Cooke, of Warrington, from their lurking-place in a hollow tree in Delamere Forest, and one of them was identified by

the British Museum authorities. Two unlabelled specimens in the Warrington Museum were possibly obtained on this occasion. This species has been taken in winter in the copper-mines at Alderley Edge. One was taken on Dec. 26th, 1892 (C. Oldham, Zool. 1893, p. 103), and another captured on Dec. 15th, 1894. Coward has obtained several specimens from one of the pools in Dunham Park. We have observed it flying over a large horse-pond near Mouldsworth, at the pool in Higher Peover Park, and on the Ellesmere Canal at the point where it is crossed by the Whitchurch and Tarporley road. The bats in the last locality were restricted to a small area where the towing-path is overhung by trees, and although search was made, no others were seen on the canal for a mile in either direction. Daubenton's Bat comes abroad about seventy minutes after sunset, and it is difficult to distinguish the bats from their shadows as they skim over the surface of the water. We have not seen this species on the wing later than August 17th, although we paid several visits to the pool in Dunham Park during the latter half of that month and September, 1894, in the hope of finding it.

V. mystacinus, Leisler; Whiskered Bat.—Widely distributed. One was found asleep on the top of a stone wall at Fernilee, near Whaley Bridge, on May 30th, 1885 (W. D. Roebuck, 'Naturalist,' 1886, p. 113), and another was knocked down near the same place at mid-day on April 26th, 1886 (T. A. Coward, Zool. 1888, p. 222). We obtained a specimen which was hawking up and down a hedge-side at dusk, at Northen Etchells, on Sept. 15th, 1888, and another in a similar spot at Mouldsworth, in June, 1894. One which we took from beneath the bark of a dead fir in Delamere Forest on August 7th, 1893, is now in the Grosvenor Museum, Chester. We have examined a specimen in the collection of Mr. J. Chappell, of Openshaw, which was caught at Holmes Chapel, and another from Dunham Park, in the possession of Mr. A. Salmon, of Bowdon. From December to March we have repeatedly taken this species in the old mines at Alderley Edge (T. A. Coward, Zool. 1888, p. 222; C. Oldham, Zool. 1893, p. 103). Copper was worked at Alderley in pre-Roman days, but the low galleries running horizontally into the sandstone rock, where we have found the bats, are of much more recent date. A dipterous insect and two moths (*Scotosia dubitata* and *Gonoptera libatrix*) are frequently found on the walls, and possibly

afford food for the bats. The Whiskered and Long-eared Bats, which are found in about equal numbers, do not crowd together for warmth like hibernating Noctules, but are scattered singly about the roof and walls, from which they generally hang head downwards, sometimes as much as 100 yards from the mouth of the tunnel. A Whiskered Bat taken on Dec. 26th, 1892, was not in the usual position, but wedged horizontally into a small crevice. When found, the bats are covered with moisture and are very cold and lethargic; but on being handled their temperature rises rapidly, and they become lively enough in the course of a few minutes. Whiskered Bats which we have taken home from Alderley have flown energetically about a room, but we have never been able to induce them to feed, and they have invariably died in a few days.

Order INSECTIVORA.—Family ERINACEIDÆ.

Erinaceus europæus, L.; Hedgehog.—Common and generally distributed. This species is accused by gamekeepers of destroying eggs and young birds, and is often caught in traps baited with flesh. The Hedgehog is perhaps more indifferent to the presence of man than most wild animals. Coward once came upon one in a dry ditch in Dunham Park, which smelt at his boots and looked up into his face for some minutes, but did not show any sign of fear until he handled it, when it rolled up and remained in that position for some time.

Family SORICIDÆ.

Sorex araneus, L.; Common Shrew; Nurserow; Nostral.—Common. We have had specimens from many widely separated localities. There is an albino from Picton in the Grosvenor Museum, Chester. The late J. F. Robinson, of Frodsham ('Manchester City News,' June 30th, 1883), thus describes the old superstition regarding the Shrew:—"I remember well a large ash-tree, which was known as the 'Rock of Ages.' It always puzzled me to know why the small ash twigs and young boughs were gathered and hung upon the shippon roof over the cows about calving time, to ensure freedom from disease, and it was some time before I found out the reason. It was a shrew-ash, and for several generations it was regarded by the villagers as a tree possessing remarkable virtues, because a wretched shrew-

mouse had been fastened in alive in an auger-hole made in the stem as a living tomb. . . . When the tree was sawn up several spots were revealed, marked by a brownish mass of decaying wood, where the harmless little animal had been thrust in by the superstitious farmers."

Sorex minutus, L.; Lesser Shrew.—Not so plentiful as *S. araneus*, but has probably been greatly overlooked. The first Lesser Shrew recorded from Cheshire was sent to us, in the flesh, on Jan. 24th, 1894, by Mr. Newman Neave, of Rainow, near Macclesfield, whose cat had brought it into the house a day or two previously. This specimen is now in the Owens College Museum, Manchester (N. Neave, Zool. 1894, p. 110; C. Oldham, 'Naturalist,' 1894, p. 130). A pellet of the Barn Owl, obtained at Great Budworth in May, 1894, contained one skull of this species and six of *S. araneus*. A second skull was obtained from an Owl's pellet found in Dunham Park in September, 1894. Mr. Oldfield Thomas, of the British Museum, has kindly confirmed our identification of these two skulls.

Crossopus fodiens (Pall.); Water Shrew.—In the district drained by the rivers Mersey and Bollin this species is decidedly common. Ashley, Baguley, Bowdon, Brooklands, Dunham, Gatley, Northenden, and Wythenshawe may be cited as localities. We have also seen it at Chelford, and found its skull in a Barn Owl's pellet from Great Budworth. Byerley gives one record only, "Taken at Egremont by Mr. R. Abbott." Mr. Newstead names Ince, Elton, and Hatchmere as localities where he has seen it.

An example described as an Oared Shrew (*S. remifer*, Geoff.), was taken many years ago at Birkenhead by Mr. Wm. Webster, jun., of Upton (Zool. 1848, p. 2009).

Family TALPIDÆ.

Talpa europæa, L.; Mole; Moudywarp.—Common and widely distributed. Occurs on the high ground in the east of the county, as well as throughout the Cheshire plain. Mr. Newstead mentions having seen "several specimens of a cream-colour with the under parts golden yellow," and there is an example of this variety from Saltney in the Grosvenor Museum, Chester.

Order RODENTIA.—Family SCIURIDÆ.

Sciurus vulgaris, L.; Squirrel. — This species is very plentiful in Delamere Forest, and is common in the parks, woods, and coverts throughout the county. It is persecuted by gamekeepers, and may often be seen in their “museums.” Oldham once watched a Squirrel for some time in a beech at Capesthorpe. The road beneath the tree was covered with the half-ripened fruit which the little creature had dropped, and it was seen that where the involucre had been gnawed through so as to expose only one shrivelled and barren mast, the remaining masts were also barren; whereas fruits which, judging from the size of the cells, had contained well-developed masts, had been gnawed through independently on either side. The Squirrel is partial to mushrooms, and will also, occasionally at any rate, eat poisonous fungi (C. Wolley-Dod, ‘Field,’ Sept. 29th, 1893, p. 491).

Family MŪOXIDÆ.

Muscardinus avellanarius (L.); Dormouse. — The Dormouse has been recorded from several localities in Cheshire, and is probably more common than is generally supposed; but, owing to its nocturnal and retiring habits, and the secluded nature of its haunts, it is doubtless often overlooked. Byerley says, “Mr. Brockholes has seen it in Prenton Wood.” Mr. Newstead, in his list, mentions one found by his father “in the hollow of an old apple-tree at Thornton-le-Moors in the autumn of 1885.” Mr. Thomas Worthington informs us that he frequently met with this species at Peover from forty to fifty years ago, and we have reliable evidence that it is still to be found there. Mr. H. H. Corbett says (*in lit.*) that Dormice were common in the woods at Alderley about thirty years ago. Mr. J. Kenyon, Lord Egeron’s head-keeper, states that he has occasionally found Dormice in the woods on the Tatton Estate. In the ‘Manchester City News’ for March 3rd, 1883, a short account of this species is given by J. F. Robinson, who says:—“It can be met with in the summer season at the foot of the Woodhouse Hills [near Frodsham] in sheltered sunny nooks, where I have found four nests, each containing young, all in a radius of three or four yards.” One was captured in its nest in the Goyt Valley, above Errwood

Hall, on May 26th, 1890 :—“ The nest was suspended from the bough of a fallen tree, and was perhaps eighteen inches or two feet from the ground ” (N. Neave, *in lit.*).

Family MURIDÆ

Microtus amphibius (L.); Water Vole; Water Rat.—This species is common and generally distributed. In the winter of 1881–1882 Mr. E. Comber shot an example of the black variety at Parkgate, in Wirral (Zool. 1890, p. 384). Another was observed in the same neighbourhood in May, 1890, and Mr. King, of Carlisle, has met with this form on the banks of the



FIG. 1.—Right upper molars of (a) *agrestis*, (b) *glareolus*, $\times 10\frac{1}{2}$.

Dee (Macpherson and Aplin, Zool. 1892, p. 287). The Water Vole does not invariably bring forth its young in a burrow in the bank of some stream or pond. On June 25th, 1887, we found three spherical nests made of gnawed reeds and flags, placed on platforms of the same materials, which raised them above the water, in a reed-bed at Pickmere Mere. One of the nests contained four blind young ones, one of which was much darker in colour than the other three (C. Oldham, ‘Naturalist,’ 1892, p. 4).

M. agrestis (De Selys); Field Vole; Field Mouse.—Abundant and generally distributed. In the Grosvenor Museum, Chester, there are two pied examples from Cotton Edmunds, and an albino from Nantwich (Newstead). We have trapped this species in plantations, gardens, and hedgerows, but its usual habitat is the open fields, where, in some places, the turf is so honeycombed by its burrows as to resemble a miniature rabbit-warren. In Dunham Park, Field Voles form the staple food of

the Barn Owl. We have examined a great number of pellets from this locality, and have found only a few skulls of *glareolus*; whereas the skulls of *agrestis* exceed those of all the other mammals together. In old meadows this species is often so numerous as to be a perfect plague, not only on account of the amount it actually eats, but because its nests clog the knives of the mowing-machines when the grass is cut. In winter, holly-bushes may be seen in the hedgerows with the smaller twigs stripped of bark, and though in some cases the damage may be done by Bank Voles, in others the present species is certainly the culprit

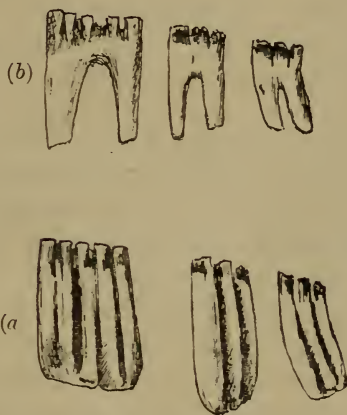


FIG. 2.—Lower molars of (a) *agrestis*, (b) *glareolus*, $\times 5\frac{1}{2}$.

(*cf.* Zool. 1890, p. 98). The abundance of this and the next species is doubtless to some extent due to the constant persecution of their natural enemies, Kestrels, Barn Owls, and Weasels.

M. glareolus (Schreb.); Bank Vole. — This species is common and generally distributed, but has been much overlooked in Cheshire, as is doubtless the case in other parts of the country. In the neighbourhood of Sale, Northenden, and Gatley, the Bank Vole is extremely numerous in hedge-banks where there is a sufficient amount of undergrowth to afford it the covert it delights in, and we have trapped as many as six in one hedgerow in a single night. The Rev. C. Wolley-Dod states (*in lit.*) that it is abundant at Edge, near Malpas. Mr. R. Newstead has sent us teeth taken from the stomach of a Kestrel from Eaton, and from

pellets of the same species from Aldford. We have received many specimens from Mr. N. Neave, taken at Rainow, near Macclesfield, and have trapped it in the same district at Higher Sutton, as well as at Brooklands, Bowdon, Ashley, Ringway, Lymm, Siddington, Chelford, Mouldsworth, and Parkgate. Its favourite haunts are hedge-banks and copses, but we have obtained specimens in gardens, and, at Gatley and Lymm, in osier-beds. By frequenting such situations it is less liable than *agrestis* to fall a prey to the Barn Owl, though we have found several skulls in pellets from Great Budworth, Dunham Park, and Wythenshawe. In traps baited with bread sprinkled with powdered aniseed this species is taken much more freely than *agrestis*, a result possibly due to its more omnivorous habits. The Bank Vole may be readily distinguished from the Field Vole by its slighter build, longer tail, and redder fur. The difference in the teeth is very marked (figs. 1, 2). In fully mature *glareolus* the grinders in both jaws are furnished with double roots, the teeth in the upper assuming this form at an earlier age than those in the lower jaw; whereas in *agrestis* the teeth retain their simple form throughout life. In the 2nd edition of Bell's 'British Quadrupeds' the number of cemental spaces in the second upper grinder is given as six, but, as a reference to the accompanying figures will show, there are four spaces in *glareolus* and five in *agrestis*. The angles of all the teeth in *glareolus* are much more rounded than in *agrestis*.

Mus decumanus, Pall.; Brown Rat. — This common and destructive species abounds everywhere, and is detested alike by the gamekeeper and farmer. Many are killed by Barn Owls, which should be encouraged, if only for this reason. Stoats and Weasels might keep them in check to some extent, but they are under the gamekeeper's ban themselves. In many places the hedge-banks are honeycombed by rat-holes, and the creatures may be met with in nearly every pond and ditch, as well as in game-coverts and about farm-buildings and houses. In Dunham Park they are exceedingly numerous, making their holes beneath the rhododendron-bushes. The large Pond-mussel (*Anodonta cygnea*) is eaten by this species, and we have often found shells with the margins of the valves bitten away; but it is not clear how the rats force open the shells, which are held together by very strong muscles.

M. rattus, L.; Black Rat. — Possibly lingers in a few places, but is very rare. Is still caught on shipboard in the Birkenhead Docks (F. H. Mills, Zool. 1894, p. 186). There is an old specimen without date in the Grosvenor Museum, Chester, from Aldersey. Mr. Newstead states:—"It is about five years since I heard of the species at Aldersey; at that time a resident told me it was then fairly common." In the 'Manchester City News' of Nov. 24th, 1883, J. F. Robinson describes the finding of skeletons of the Black Rat when some repairs were being made at Castle Park, Frodsham. He states that "the skins were reversed and drawn over the skulls," and adds, "This was a proof that they had been murdered by the Brown Rat"; but, as we have known a Barn Owl to treat a Brown Rat in exactly the same way, it is possible that owls were the destroyers.

M. musculus, L.; Common Mouse. — A common pest. We have trapped it in roadside-hedges at a considerable distance from houses or farm-buildings.

M. sylvaticus, L.; Long-tailed Field Mouse. — Generally distributed and abundant. There is a specimen of a pale buff variety in the Grosvenor Museum, Chester (Newstead). This mouse is very easily trapped. We caught one in Dunham Park only a few minutes after having removed a dead one from the trap.

M. minutus, Pall.; Harvest Mouse. — We can say nothing of this species from personal observation, and the evidence of its occurrence in Cheshire is of a meagre and unsatisfactory nature. Byerley says that it is found "not unfrequently in wheat-stacks, barns, and fields," but he gives no actual records, and we have been unable to obtain any evidence in support of his statement. The finding of nests in the reeds on Frodsham Marsh has been recorded in the columns of the 'Manchester City News' by J. F. Robinson. Mr. Sam Radcliffe, of Ashton-under-Lyne, informs us that some years ago he caught several examples on the premises of a hay and straw dealer in that town, who observed the mice in some straw which he had purchased on a farm near Wilmslow. Mr. Radcliffe kept some of the mice for several weeks in a large fern-case, where a female gave birth to a litter of young ones.

Family LEPORIDÆ.

Lepus europæus, Pall.; Common Hare.—Common and generally distributed. Hares have become scarcer in some districts since the passing of the Ground Game Act.

L. timidus, L., *variabilis*, Pall.; Alpine Hare.—Restricted to the moors of the north-east, where it is abundant. Colonel J. Crompton Lees, of Oldham, has kindly furnished us with the following particulars of this species, which was introduced originally on his shooting at Greenfield, Yorkshire. He writes, under date June 29th, 1894:—"I believe fifty Blue Hares were turned out altogether in or about the years 1880, 1881, or 1882, and that they came from Perthshire. My keeper tells me that last March, when, of course, they were white, he counted about fifty as he sat in one spot. He used a pair of field-glasses. Some time in the sixties we turned out some Blue Hares, but they gradually decreased in number till they became quite extinct. I am happy to say the second attempt has proved successful." From Greenfield the hares have crossed the Cheshire border, and are now thoroughly established, and very plentiful on the higher parts of the moors in Longdendale, from Swineshaw, near Staly-bridge, to Woodhead. In winter they sometimes come down on to the lower ground, and, after a thaw, are very conspicuous objects, looking like sheets of white paper scattered about the bare hill-sides. A specimen in the Grosvenor Museum, Chester, was shot on Featherbed Moss, about two miles above Crowden, on November 17th, 1894. It scaled 4 lbs. 10 oz., and had only partially assumed the winter dress, although on the same day that it was obtained one was seen almost entirely white.

L. cuniculus, L.; Rabbit.—Common. The black variety occurs sporadically, and is abundant in the large warrens at Lyme Park.

(To be continued.)

ON THE PROPER SPECIFIC NAME OF THE WEASEL.

BY OLDFIELD THOMAS, F.Z.S.

MANY years ago the late Mr. E. R. Alston told me he saw no escape from the necessity for using the specific name *nivalis*, Linn., for the Common Weasel; and though, so far as I know, he never carried this view into effect, nor, with the common laxity of authors in this respect, has any one else done so, with the exception of Scandinavian zoologists, the case seems to be so clear that, on the principle enunciated in my note on the Shrews (p. 62), I feel compelled to adopt the name Linnæus gave to the species.

Its synonymy would then stand as follows:—

PUTORIUS NIVALIS (Linn.).

Mustela nivalis, Linn. Syst. Nat. (12), i. 69, 1766; Hellenius, Retzius, Holmgren, Lilljeborg, &c.

Mustela vulgaris, Erxl. Syst. Regn. An. Mamm. p. 471, 1777;
et auctorum plurimorum.

The name was given to a specimen found running about on the snow, and had no reference to the colour of the animal.

[The proposal to change a name which has been in use for nearly 120 years is one which probably most of our readers will agree ought not to be too hastily accepted; and before adopting the view above expressed it will be well to look into the matter a little more closely. Mr. Thomas says the case “seems to be so clear that he feels compelled to adopt the name Linnæus gave to the species.” But the question arises, “Did Linnæus give the name to the species?” His “common Weasel” (the *Mustela vulgaris* of older authors) was evidently the Stoat, which he named *Mustela erminea*, and described as *Mustela pedibus fissis, caudæ apice atro*, with the tip of the tail black, an expression sufficiently diagnostic of the animal. What is his description of *M. nivalis*, which Mr. Thomas identifies with our Weasel? It is as follows:—“*Mustela pedibus fissis, corpore albo, caudæ apice vix pilis ullis nigris*,” in other words, an animal with a white body and with scarcely any black hairs (implying that it had some) in the tip of the tail. He refers to his previously published ‘Fauna Suecica’ (1761), and turning to the species numbered 18 in that work we find the same animal described as above, with the additional remark:—“Præcedenti simillima (i. e. *M. erminea*)

nivea, cauda etiam alba sed pilis tantum paucissimis extimis nigricantibus, nec toto caudæ apice nigris; corpus dimidio minus est *Erminea*."

In this country the expression *corpore albo* would not apply to our Weasel, which does not turn white in winter, though albino specimens are sometimes met with; but assuming that it does turn white occasionally in Scandinavia, there is still the difficulty of the black hairs in the tip of the tail, which would not be found in this animal at any season of the year, but are at all seasons characteristic of the Stoat. As regards the question of size, it is well known that with Weasels and Stoats the female is invariably smaller than the male. The conclusion then at which we arrive is that the *Mustela nivalis* of Linnæus is not our common Weasel, but a female Stoat in winter garb. We are not told on what evidence it appears that the name *nivalis* "was given to a specimen found running about on the snow." We find no mention of this either in the 'Systema Naturæ' (*l. c.*) or in the 'Fauna Suecica.' From what is there stated we infer that the term *nivalis* means "snowy white," and was deemed by Linnæus to be a good specific name for an animal which he described as *nivea*.

Whether the Common Weasel should be transferred from the genus *Mustela*, in which Linnæus placed it, to the genus *Putorius*, is a doubtful question, the discussion of which must be reserved for some future occasion.—ED.]

OBSERVATIONS ON BIRDS IN MID-WALES.

By J. H. SALTER.

(University College, Aberystwyth.)

(Continued from p. 143.)

ACCIPITRES.

BARN OWL, *Strix flammea*. Not at all numerous.

LONG-EARED OWL, *Asio otus*. Fairly common, especially in the Nanteos woods.

SHORT-EARED OWL, *A. accipitrinus*. Occurs most commonly on Borth and Tregaron peat-bogs. About 1874 Capt. G. W. Cosens found several pairs breeding near Sir Pryse Pryse's lakes, and recorded the fact at the time in a letter to the 'Field.'

TAWNY OWL, *Syrnium aluco*. The most common and generally distributed of the Owls. While a friend of ours was examining a nest of young near Rhayader, one of the old birds flew against his back "as if a cricket-ball had struck him." Capt. Cosens disturbed one from a rabbit-burrow on putting in a ferret.

SPARROW HAWK, *Accipiter nisus*. Common. Seems when undisturbed to resort to the same nest year after year.

MARSH HARRIER, *Circus æruginosus*. Many years ago numerous about Borth and Tregaron bogs. Mr. Chas. Jeffreys, of Glandyfi Castle, remembers when the Moor Buzzard, "the dark brown Hawk with the light-coloured head," as well as the blue-grey Hen Harrier, were to be seen daily working over the salt-marsh below his house. Capt. G. W. Cosens has a young male bird, which was obtained on Borth Bog about 1870. Another was shot upon Tregaron Bog about 1882.

HEN HARRIER, *C. cyaneus*. Well known to those who have shot over Borth and Tregaron bogs, or the marshy flats of the Dysynni above Towyn, for Snipe and Ducks in winter. Mr. F. Abel speaks of it as "the only Hawk which hunts the ground regularly like a pointer." He has seen it strike at a Snipe, but without success. On Tregaron Bog the Ducks have been seen to make for the river and dive as the Harrier strikes at them. Capt. Cosens tells me that as he was watching some Teal upon the water a male bird came suddenly down upon them and carried one off. I saw a Ring-tail quartering the bog on June 8th, 1892. An adult male and dark-coloured young bird are preserved at Nanteos.

MONTAGU'S HARRIER, *C. cineraceus*. Mr. F. T. Fielden, of Borth, has an adult female, which he obtained November 5th, 1888. It weighed $9\frac{1}{2}$ oz.; length, $18\frac{3}{4}$ in. The irides were bright straw-yellow.

BUZZARD, *Buteo vulgaris*. Does not breed within a dozen miles of Aberystwyth, but in the wilder hill districts is still to be found in all suitable localities. A dozen pairs probably nest within a three-mile radius of a remote sheep farm which we have occasionally made our head-quarters. We have seen three pairs in the course of a morning upon the upper Wye, working in a slow, business-like way along the rocky slopes, probably in search of beetles and earth-worms. One in the Brecon Beacons, March 29th, 1894. The Buzzard is always to be seen on Cader Idris. It does not now breed upon the Bird Rock, owing to persecution; was very numerous in that neighbourhood till about 1876, when, strict game-preserving coming into vogue at Peniarth Uchaf, many were destroyed, "up to nine in one week." Three eggs were taken in 1894 from a nest within sight of the

Bird Rock; one of them, now in my possession, is exceptionally well-marked. The Buzzard allows itself to be shot or trapped at all times with the greatest ease. The hen bird will sit till one is within a few yards of the nest. I have sometimes seen a Buzzard cross the valley with half-folded wings, and it occasionally hovers, looking for the moment like a giant Kestrel. On fine evenings at sunset the Buzzards soar as if to enjoy the last rays of the light. They are constantly harassed and beset by Crows. The farmers do not view them with favour on account of the occasional loss of a newly-hatched chicken. Nest-building begins at the end of March, rocks being generally chosen in this district, but exceptionally a tree. The site can usually be reached without the least difficulty. A nest containing two eggs on May 21st, 1893, was garnished with fresh-pulled leafy twigs of birch and mountain ash. Another nest, on the 23rd, contained three young ones about a week old; and provision in the shape of a shrew, a mouse, and a piece of sheep intestine. Later, the nest contained pellets and the remains of a crow. A nesting-ledge, which I inspected on May 6th, 1894, was about a yard across, littered with bits of stick and sedge, with a slight grass-lined hollow in the middle for the two eggs. The old birds hovered overhead, mewing piercingly and persistently. A pair near Plynlimon on May 30th, 1894, showed no signs of having a nest.

ROUGH-LEGGED BUZZARD, *B. lagopus*. Only one, or possibly two, occurrences.

PEREGRINE FALCON, *Falco peregrinus*. Appears to be banished from most of its former breeding-places, as on the cliff between Aberystwyth and Borth, in the colony of Herring Gulls between Aberaeron and New Quay, and on the Bird Rock. At the latter locality, where it was long tolerated, Mr. Hutchings has seen it strike down Jackdaws, and, on picking them up, has found the back torn by the claw of the hind toe, with which alone the stroke seemed to be given. Mr. F. Abel tells me that one caught up a Teal which he had wounded. Their existence here was at last considered incompatible with the rearing of Pheasants at Peniarth Uchaf, so in 1888 the male bird was shot. The female went away, and shortly returned with another mate; both were shot, and the three eggs taken. Since this date the Bird Rock has been falconless. There was a nest upon the cliff some six miles south of Aberystwyth till 1893, when I believe the young birds

were destroyed; and this year I could see nothing of Falcons here or elsewhere. In June I did not meet with any in walking along the whole of the Cardiganshire coast. Inland there was formerly a nest upon a crag in one of the tributary dales of the upper Towy; and in March, 1894, a Falcon revisited this locality. In autumn and winter the species is less local, and there have been numerous occurrences.

MERLIN, *F. aesalon*. Not uncommon in autumn and winter, especially about the salt-marshes of the Dovey. Doubtless breeds on Borth and Tregaron bogs.

HOBBY, *F. subbuteo*. One seen by Capt. G. W. Cosens flying over his house at Llanbadarn in September, 1891.

KESTREL, *F. tinnunculus*. Breeds commonly in the cliffs, both on the coast and in the rocky dales of the Wye and Towy. Some eggs found in 1892 were compared with others taken from the same hole in 1882, and were evidently the produce of the same bird. I have seen the eggs in a hole in a quarry laid on the bare stone without a trace of nesting material. Kestrels killed many small birds during frost, January 9th to 12th, 1892. At Hafod, on April 5th, 1894, one rose hastily from the ground, leaving the tail of a lizard, which continued to wriggle for about an hour.

WHITE-TAILED EAGLE, *Haliaeetus albicilla*. An Eagle, no doubt of this species, was seen by Mr. F. Abel at the Bird Rock on two consecutive days between the 15th and 20th of November, 1881 or 1882. The weather was very bad and rough at the time. On the second occasion, when it was also seen by several members of a shooting party, it left the rock, and flew in the direction of Barmouth.

KITE, *Milvus iclinus*. Well known to all whose recollection of Mid-Wales extends back forty or fifty years. At the present day it is doubtful if more than seven or eight pairs are left in the Principality. I know of no recent instance of the Kite having nested in Cardiganshire. At Devil's Bridge, which was formerly a favourite haunt, I hear of thirteen having been seen upon the wing at once. The last nest in this locality was about 1860. The female was shot from the nest, and the eggs taken. Two young birds from the same neighbourhood were brought to Nanteos. The female, after killing her companion, lived there for about twenty years in captivity, and laid one egg. The Kite wanders to

some extent, and occasionally revisits its old haunts. Mr. F. Abel tells me that old people remember that the Kite used to breed on the Bird Rock, and informs me that one haunted the woods at Peniarth Uchaf from November, 1893, to March, 1894. Mr. F. T. Fielden obtained a fine male bird at Glandovey on August 15th, 1889. When first seen it was mobbed by Crows. He also observed one at the Teifi Pools in April, 1894. A Kite is preserved at Falcondale, and another has been seen over Tregaron Bog. Other localities had better be withheld in the interest of the birds; but I may add some details to those already given in 'The Zoologist' as to the nesting of this fast-disappearing species. On March 26th, 1894, a pair were reported to be building in a small wood of thin oaks, where for some years they have persisted in attempting to nest in full view of a neighbouring farm. I was not able to visit this locality till May 6th. The nest was soon found, but was empty, the eggs having evidently been taken. A specimen of the lining included a piece of coarse sacking, old newspaper, and tobacco-paper. Near at hand was last year's nest, and at no great distance a third older nest. In the latter were two or three pen-feathers, showing that it had held young Kites, probably in 1892. While this investigation was in progress, a Kite passed over the wood. Passing a bold wooded bluff at the junction of three valleys,—a great meeting-place for Kites, Buzzards, Ravens, and Carrion Crows, and the scene of constant aërial skirmishing,—we mounted to a wooded gulley, above which a pair of Kites soon appeared. They were silent, but their animated flight, which I had never seen to such advantage, showed their interest in our approach. As they rose or dipped behind the sky-line, the forked tail was now closed, now spread, and inclined to one side or the other with each easy and graceful turn. The nest proved to be one in which we had found young Carrion Crows last year. It had been enlarged and repaired, and by climbing the slope I could look into it, thus ascertaining that it contained one egg. This was no doubt the second attempt at breeding of the pair whose nest we had seen previously. Report spoke of a second pair in a neighbouring valley. A farmer told me that he remembered an instance of the Kite, in general a tree-builder, having nested upon the rocks.

GALLINÆ.

RED GROUSE, *Lagopus scoticus*. Grouse are in general very scarce upon the grass-grown uplands of Mid-Wales. If met with at all, it is generally where the crowberry (*Empetrum nigrum*) grows. In a few spots where heather flourishes, as on the Elan Moors near Rhayader, and the low-lying Teifi Bog, grouse are correspondingly plentiful.

BLACK GROUSE, *Tetrao tetrix*. Probably extinct as a resident in Cardiganshire. Said to have been formerly found on Borth Bog, and may revisit that locality, as about 1886 Mr. F. T. Fielden saw a solitary Grey Hen. I am told that Black Game were introduced at Crosswood by the grandfather of the present Lord Lisburne. All wandered or were shot off, with the exception of a single Grey Hen, which was supposed to have bred with a Red Grouse, as a bird which was taken to be a hybrid between the two was obtained. On the Gogerddan property one or two are still obtained almost every shooting season. They are supposed to cross the hills from Radnorshire, where there are some about Cwm Elan.

PHEASANT, *Phasianus colchicus*. Owing to the nature of the country, Pheasant-preserving is not general. A few wild-bred birds, without the white ring, are still met with.

RED-LEGGED PARTRIDGE, *Caccabis rufa*. Eggs have been hatched out in Cardiganshire from time to time, but the species has never established itself.

PARTRIDGE, *Perdix cinerea*. Fairly plentiful, considering the small amount of arable land.

QUAIL, *Coturnix communis*. Met with almost every season, and in some years exceptionally numerous. I heard of two coveys near Borth in 1893. Years ago a shooting season seldom passed without ten or twelve couples being obtained on the Gogerddan estates.

HERODIONES.

HERON, *Ardea cinerea*. A few always on the Dovey, while others fish the small streams in the hills. There are no large heronries, but about eight pairs of birds, carefully protected by the owner, Mr. J. Parry, breed at Llidiardau, Llanilar. About the same number nest at Peniarth, above Towyn, in very tall larches. A few pairs have bred in the rookery at Talgarth near Machynlleth, sharing some Scotch firs with the Rooks; but last

spring the nests appeared to be unoccupied. A fine old Heron, preserved at Gogerddan, has the greater part of the back and wings white.

LITTLE BITTERN, *Ardetta minuta*. An example, shot about forty years ago near Lodge Park by the late Mr. Jeffreys, of Glandyfi Castle, is now in the possession of the Viscountess Parker.

BITTERN, *Botaurus stellaris*. The two large bogs, which form the most interesting feature of the county from an ornithological point of view,—the Gors Fochno, stretching inland from Borth, and the Gors Teifi near Tregaron,—must formerly have been favourite haunts of this bird. They are revisited almost annually, as Mr. Hutchings receives Bitterns for preservation whenever a few days of hard frost occur. During frost in the first week of January, 1894, five or six were received, chiefly from these two localities; and one occurred about the same time at Peniarth, near Towyn. I was shown a spring upon the margin of the Teifi Bog, which had been frequented by an “Aderyn y Bwn” for some days. The only one received during the present winter was sent from Borth on December 10th. There are stuffed Bitterns at Bronpadarn, Lodge Park, Pen-y-bont-pren, &c. The shooting parties used to meet with about half a dozen in the neighbourhood of Borth Bog every winter.

SPOONBILL, *Platalea leucorodia*. A not infrequent visitor, generally to the Dovey. One was shot near Aberystwyth about 1838. About 1879 one frequented the Dovey for three months, and, though often tried for, was never shot. In the autumn of 1891 Mr. F. T. Fielden had a perfect view of a Spoonbill, which he stalked to within thirty yards. A Herring Gull swooped at it screaming, and put it up, and to this it owed its escape. Mr. Hutchings believes that he has received four at long intervals. A specimen, shot by the late Mr. Jeffreys, of Glandyfi Castle, about 1855, is still preserved there. It was seen to alight in the river in company with seven Sheldrakes. Mr. Chas. Jeffreys tells me that on May 16th, 1893, a flock of fourteen Spoonbills settled in the river nearly opposite the castle. He watched them through a glass running about restlessly on a sandy spit, and wading off to a mud-bank, shovelling up the ooze with their bills. They spent most of the day here, and were not shot at, but were seen to go off towards evening.

(To be continued.)

NOTES AND QUERIES.

The Manuscript of White's 'Selborne.'—The sale by auction of this manuscript, announced in our last number (p. 147), took place in London, at the rooms of Messrs. Sotheby, Wilkinson and Hodge, on the 26th April last. It was put up at £100, and the bidding having advanced gradually to £294 (or two hundred and eighty guineas), it was knocked down for that sum to Mr. J. Pearson, who, it was understood, purchased it on commission for Mr. S. M. Samuel, of No. 6, Palace Court, W.

MAMMALIA.

Irish Hare turning white in Winter.—I was surprised to see the discussion of this subject in the pages of 'The Zoologist,' as I imagined that most people had now learnt that the often-repeated statements in Natural Histories, such as that "in Ireland, doubtless owing to the mild climate, the Mountain Hare does not turn white in winter" (*vide* Lydekker, Brit. Mammals, pp. 226-7), are not true. Ever since the time of William Thompson (Nat. Hist. of Ireland, p. 28) it has been known to Irish naturalists that the Irish Hare *can* and often *does* undergo a considerable change in winter; the amount of the change, no doubt, depending on weather and other conditions; and the late Mr. A. E. Knox has stated that Irish Hares introduced into Petworth Park, Sussex (as I am informed by Prof. Newton), kept up their former habit of turning white in winter for several seasons—a fact which I have also noticed myself in the case of Mountain Hares from Wicklow when turned down on the lowlands of Wexford. I have for years been collecting information on this and other matters relative to the Irish Hare, and have even taken the trouble to collect facts by means of a circular sent round to many game-preservers, or their keepers, in Ireland, and I have not the slightest doubt that some Hares which have turned nearly quite white are to be found *every* season in Ireland. Pure white Hares are no doubt rarer, but have certainly been recorded (*vide* Thompson *loc. cit.* and G. H. Kinahan in 'Land and Water,' March 3rd, 1891), but it seems to me that the really important point to notice is not whether *any* Hare has ever turned quite white in Ireland in winter, but that in Ireland it is the exception for a Hare to do so, or even to turn nearly white, whereas in Scotland it appears to be the rule. I may add that in mountainous parts of Ireland even leverets can partially undergo the winter change, as evidenced by a leveret in my own collection which was sent me by Mr. John Hunter, of Wooden Bridge, Co. Wicklow.—G. E. H. BARRETT-HAMILTON (Trinity College, Cambridge).

In addition to the evidence already adduced on this subject (pp. 104, 149), I may state that in February, 1894, I saw a perfectly white Hare

near the top of Derryclare, one of the mountains known as the Twelve Pins, in Connemara, where I was told at the time that this was not uncommon, and that a few years previously two entirely white Hares had been seen on Cashel Hill. — G. H. CATON HAIGH (Grainsby Hall, Great Grimsby).

The Irish Stoat.—What is a barbarous name? It is surely somewhat late in the day for the Editor of 'The Zoologist' to protest against the use of native names for animals. According to the arguments put forth against *Assogue*, &c., in the editorial note to the description of the Irish Stoat in last month's 'Zoologist' (p. 129), we should not use "Wapiti" nor "Kudu," and so on. In fact, about one half of the names in general use for animals are not real original English words, but engrafted native names, adopted from every language under the sun, and none the worse on that account. Indeed native names are the best colloquial terms possible when properly applied, and English compounds the most clumsy and unsuitable, besides being generally uncertain in their application, and nearly always involving a false or doubtful assumption about affinity. The mode of spelling is of course a different question, on which opinions may be very naturally divided. To me it seemed that *Easóg* is too strange-looking and unpronounceable a word for any Englishman to adopt, while *Assogue* would perhaps have a chance of surviving, and we should then have the convenience of three names for three species. I may add that I am personally entirely responsible for the name proposed, as my colleague, Mr. Barrett-Hamilton, was at the time of writing the paragraph beyond the reach of consultation. Like the Editor, I should certainly not "admit that the spelling of an Irish name as it is pronounced makes it English." What makes it English, as in the case of Wapiti, Kudu, Antelope, and others, is its use by English people in English books.—OLDFIELD THOMAS.

[Mr. Thomas seems to have misunderstood the drift of our remarks (p. 129). Our objection was not to the use of the native name *Easóg*, which is on a par with *Wapiti* and *Kudu* as above quoted, but to *assogue*, which is neither Irish nor English, and hence in our opinion "barbarous." —ED.]

Polecat in Cambridgeshire.—The following is from the 'Ipswich Journal' of Feb. 23rd, 1895, and may perhaps be worth publication in 'The Zoologist,' if only to show that the Polecat is not yet exterminated on the Cambridgeshire and Suffolk borders:—"At Isleham, in the Cambridgeshire Fens, a Polecat was found by the lock-keeper with its feet frozen to the top of the lock-gate. It had evidently stopped on the gate to watch some object of prey."—G. T. ROPE (Blaxhall, Wickham Market).

Food of the Bank Vole.—When staying at Chollerton, on the North Tyne, for a few days after Christmas, I noticed under a hawthorn hedge a

number of little heaps (in some places an inch in depth) of haw-pips and haw-rind, in many cases at the mouths of small holes in the bank, in other cases in the grass close to a network of runs which extended all over the hedge-bank. The pips were gnawed in on one side and the kernels extracted. Being anxious to ascertain what species of Mouse was responsible for this, I set a few small traps at the mouths of these holes and captured four specimens of the Bank Vole, *Arvicola glareolus*. Bell states that the food consists of fruit and roots, carrion, insects, worms, and snails; and in confinement some Bank Voles he possessed showed a partiality for gooseberries. It seems to me that, from the nature of its haunts, the fruit of the hawthorn (both kernel and mesocarp) forms a very much larger portion of its diet than has been hitherto suspected. In his description of the Bank Vole, Bell mentions that it is a good climber. It would be interesting to ascertain whether this little rodent climbs the hawthorn for the haws, and whether its tail is prehensile. No doubt a few berries which had fallen would be scattered about under the hedge, but in the case which came under my immediate notice the quantity of fragments of those eaten was so considerable as to suggest that the little fellows had had many a climb to obtain their food.—JOHN H. TEESDALE (St. Margaret's, W. Dulwich).

[The Bank Vole is an expert climber, but the tail is not prehensile in this or any other species of Vole.—ED.]

Note on the Long-tailed Field Mouse.—It may be well to place on record the occurrence, at Ashford, Kent, of the Mouse described by Mr. de Winton (Zool. 1894, p. 441) as *Mus flavicollis*. I caught a specimen answering to his description in a hollow hazel-stump in which I had previously taken the typical *Mus sylvaticus*. In the flesh this animal appeared strikingly different from the common form.—G. H. CATON HAIGH (Grainsby Hall, Great Grimsby).

[The fact of this specimen having been found in a hole from which a typical *Mus sylvaticus* had been taken somewhat conflicts with Mr. de Winton's view that the two forms do not associate, and we must confess that we are not yet assured of their specific distinctness. We may add that on March 12th last we received a specimen of the so-called *flavicollis* from the neighbourhood of Malvern. The head and body measured 4 in., the tail 3½ in.—ED.]

BIRDS.

Notes on the Grouse.—Mr. Macpherson assures me that I am mistaken in attributing to him (p. 107) an opinion that Red Grouse do not migrate seasonally. Looking again at the passage to which I referred (in "The Grouse," Fur and Feather Series) it seems a natural interpretation to put upon his words, but I of course express my regret that I have misunderstood him.—HENRY H. SLATER (Thornbaugh Rectory, Wansford).

The Little Auk in Scotland.—I see in the April number of 'The Zoologist' (p. 151) a notice of the paper I read last month to the Natural History Society of Glasgow. Most unfortunately the report in the press on which your notice is based was very inaccurate, but I did not think it necessary to correct it, as I trusted to the circulation of the paper as a reprint among those interested to set it right. I send a copy herewith. You will see from it (1) that through Mr. Eagle Clarke I knew of the occurrences in the Outer Hebrides; (2) that the Ayrshire occurrences were well known to me, as I had collected the information, and in turn had passed it on to Mr. Clarke; (3) that while agreeing that some of the specimens found in East Clyde came *viâ* Forth, I cannot believe that those occurring so commonly in the immediate vicinity of Oban and Islay reached there from such a source. As regards their frequency in the line of the Great Glen, Mr. Bisshopp, of Oban, had twenty-six birds, chiefly brought to him by boys who had found them near that town; while in Islay they became common all at once "everywhere on the coast, and even far inland." To this there was no parallel in the Clyde faunal area, and the vastly greater population and the general interest which the press notices of the Little Auk excited would doubtless have led to their being observed. It is not unusual for a few birds of this species to be met with in ordinary winters in Argyllshire or Ayrshire. It would be idle on the part of any one to insist that they come *viâ* Forth.—JOHN PATERSON (83, Cumming Drive, Glasgow).

[Having received by post a long and detailed printed report of the meeting at which the paper in question was read, we naturally concluded that it was duly authorised.—ED.]

Manx Shearwater in Carnarvonshire:—In the early part of June, 1893, I visited the locality in Carnarvonshire where Mr. Coward found the dead bodies of the Manx Shearwaters, as described (p. 72). As the greater number of the bodies were lying at the mouths of rabbit-burrows on the top of a grass-covered sandy cliff, I fail to see how the birds could have met their death by being driven by strong winds against the cliff, as suggested by Mr. J. H. Gurney (p. 110). The conclusion I came to was similar to that arrived at independently by Mr. Coward, *viz.*, that men, ferreting for rabbits, had come across the Manx Shearwaters in the burrows, and slaughtered them. I am satisfied that the natives of that part of Wales who collect sea-birds' eggs had not up to that time found out how and where to obtain the eggs of the Manx Shearwater, for I used to join them in their egg-collecting expeditions, and they allowed me to act as one of themselves, sometimes at one end of the rope, sometimes at the other, this leading to awkward situations sometimes, as only one of their number could speak English, and I am ignorant of Welsh. I questioned them closely, through the interpreter, as to the "Mackerel Cocks," but they appeared to be quite ignorant of their nesting-habits. Moreover there is in

those parts a local dealer in eggs, to whom the collectors bring their spoils. He had never received any Manx Shearwaters' eggs. When in the shop of Mr. Rawlings, chemist, of Barmouth, I saw some eggs of the Manx Shearwater, which he informed me had been taken in 1893 at Bardsey Island. From what I saw for myself, I quite agree with Mr. Coward that the Manx Shearwater does breed on that part of the mainland of the coast of Carnarvonshire, and before seeing Mr. Coward's article I had intended to re-visit the spot, and endeavour to discover a living Manx Shearwater and its egg in one of those rabbit-burrows, and then communicate the fact to 'The Zoologist.'—E. W. H. BLAGG (Cheadle, Staffordshire).

In the March number of 'The Zoologist' (p. 110), Mr. Gurney suggests that the Shearwaters which we found dead on the cliffs of Carnarvonshire had been killed by being dashed against the cliffs. This I feel certain was not the case, for the birds were lying on the soft turf-slope close to the holes in which they evidently had been breeding, and not only were their necks broken, but in many cases the heads were torn off, and lay some distance from the bodies; and in other cases the heads were twisted completely round, and loose feathers from the necks lay beside them. Several birds killed in the same manner lay in a field on the landward side of a turf-wall, and, as I mentioned, one bird was dead in a hole that had been dug out with a spade. The interest of the occurrence, of course, lay in the fact of their breeding on the mainland, not in the fact that they had been killed there by some person or persons unknown.—T. A. COWARD (Higher Down, Bowdon).

Hen Harrier in Sussex.—It may interest some of your Sussex readers to know that on March 21st I received a good male Hen Harrier in the flesh from Balcombe, Sussex, with the information that the bird was killed there on March 19th by the sender, who had never seen one like it before, and did not know what it was. I have hardly any personal acquaintance with Sussex, but the Hen Harrier has become so rare over the greater part of England that I consider this occurrence as worthy of record.—LILFORD (Lilford Hall, Oundle).

Distribution of the Pomatorhine Skua in Summer.—Referring to Col. Feilden's note on this subject (p. 172), I may state that on the 25th July last I was midway between the F  roes and Iceland in the Danish mail-boat 'Thyra,' and my log contains the following entry:—"A surprising number of Richardson's Skuas round the ship, mixed with a larger species (probably Pomatorhines, but none of these came quite close enough to me for identification) in the proportion of about six to one. Sometimes a flock of some seventy individuals together. This lasted till the afternoon." The Pomatorhine Skua has never been known to breed in Iceland, where Richardson's Skua is abundant and everywhere distributed. I should be

inclined to think that these large flocks were very leisurely moving southwards for the winter, influenced a good deal by the winds and the plentifulness of food. In southward migrations it is by no means uncommon for a certain proportion of old birds to accompany the first flights. In fact, the experience of a good many autumns on the Yorkshire coast has shown me that the first Grey Plovers, for example, to appear are old birds in small parties, still more or less in summer plumage. And the same with Sanderlings and Curlew Sandpipers.—HENRY H. SLATER (Wansford).

Sandwich Terns on the Upper Thames.—A visit from eight adult Sandwich Terns, on April 10th, was quite a novelty to this neighbourhood. They arrived before 9 a.m., and the greater part of the day was spent exactly opposite this house, sitting on the hand-rail of the bucks and the piles on the weir. The day was warm and bright, with a fresh westerly breeze, and the Terns were careful always to sit facing accurately to windward. At frequent intervals one or more would take short flights, in beats of perhaps 100 yards, in quest of fish, for which they plunged down from a fair height, with the wings about two-thirds expanded, and always side to wind. Early in the afternoon they moved half to three-quarters of a mile further up the river, where, there being no convenient perches, they spent, I believe, their whole time on the wing. About 4.45 p.m. six of them returned to the rail and piles on Marlow Weir; whether the other pair had separated voluntarily, or whether powder and shot had put an end to their wanderings, I do not know. During the morning any attempt by a second bird to share a pile already occupied by one had been successfully resented by the tenant, but now a pair shared a pile more than once, and they combined to prevent the intrusion of a third individual. I did not see them leave, but I satisfied myself, with the help of a good night-glass, before going to bed, that they were not roosting on the piles or elsewhere thereabouts, and have not seen or heard of them since. The Common Tern is entitled, I think, to be classed as an annual visitor to the Upper Thames, and the Little and Black Terns are also frequent visitors. The Arctic Tern, which is recorded in Clark-Kennedy's 'Birds of Berks and Bucks' as "occasionally obtained" in these counties, I have never myself seen on the river, or at least distinguished from *Sterna fluviatilis*; while the Sandwich Tern is not mentioned by him. Mr. Aplin, in his 'Birds of Oxfordshire,' mentions it as "a rare visitor," and enumerates about six examples obtained in the neighbourhood of Oxford between 1847 and 1879. These may all have come from the West, and did not necessarily pass this neighbourhood; while it seems natural to suppose that those which lately visited Marlow flew up wind from the mouth of the river. Another point noticeable about this visitation is the number of birds which appeared, forming the largest party of sea-birds that I have ever seen up the river, where such stragglers usually appear singly. — ALFRED HENEAGE COCKS (Great Marlow, Bucks).

[We have little doubt that these birds came up the Thames from the mouth of the river, for about that date we had reports of several large "Sea Swallows" being observed between Chertsey and Laleham. The species not being identified, we supposed them to be Common Terns.—ED.]

The Raven on Sheep Farms.—Mr. Salter, writing of the Raven in Mid-Wales, remarks (p. 139):—"There is a general impression amongst the farmers that the Raven will tamper with a sheep when in difficulties, and that its misdeeds at lambing-time are of the blackest description." This impression seems to be shared by ornithologists, for Mr. Howard Saunders refers to the Raven's "depredations among lambs, weakly ewes, and game," as an established fact ('Manual of Brit. Birds,' p. 232); and Prof. Newton, though lending the weight of his own personal experience to the contrary opinion, nevertheless endorses the view that in the wilder and mountainous parts of Britain "considerable loss is inflicted by the Raven on the owners of sheep" ('Yarrell's Brit. Birds,' ed. 4, vol. ii. p. 260; and 'Dict. Birds,' p. 737, note). Without prejudice to the result of observations in other parts of Britain, I venture to express my firm belief that on hill-farms in the Highlands of Scotland our Raven is simply a scavenger, inflicting on sheep-owners no loss of any kind whatever. Practical work in a pastoral district, where Ravens have bred from immemorial time, has convinced me (1) that neither Crow nor Raven will approach a living sheep or lamb unless the animal be *in articulo mortis*; (2) that neither Crow nor Raven, albeit they pick out the eyes, will commence to tear a carcass till the animal has been dead for hours, sometimes for days; (3) that neither Crow nor Raven will meddle with a lambing ewe, even in the rare event of difficult parturition, it being their constant habit to wait on death. I class the birds together here because in practice one cannot distinguish their work, and I put the Crow first because, in comparison with the larger bird, I have found it bold, bloodthirsty, and persistent. For nine years past a pair of Ravens have made their head-quarters, and reared an annual brood, in the rocky escarpment of a green hill-face which rises abruptly above my house, and is heavily stocked with black-faced ewes. Other pairs breed in the wilder country to the north. Much of my own ground can be "spied" from the windows of the house, but I have traversed the whole of it at all times and seasons, and especially at lambing-time, when the Raven's alleged misdeeds are said to reach a climax of iniquity. Of such misdeeds I have found no trace. I have never seen a living sheep or lamb with a vacant orbit, except in a single case when the dying animal just breathed; I have never detected a sign of visceral disruption on a warm carcass, nor surprised the birds at work on anything but carrion; and I have known a lambing ewe labour heavily for a couple of hours quite unmolested, though the expectant Crows were tearing at the placental membrane a moment after the passing shepherd had relieved and removed the ewe. In the spring of

1892 the immediate neighbourhood of two pairs of Ravens was found compatible with eighteen pairs of twin lambs safely delivered and all surviving. The circumstance that an incoming tenant and a stock valuation made every living lamb at that particular time worth a possible 15s. should stand as a fairly practical test of my faith in the innocence of Ravens. Three facts in this connection are not, I think, sufficiently considered. (1) The rough-and-ready pathology of hill-sheep recognises no half-way house of sickness, with possible convalescence, between health and death; it must be one thing or the other. A sick sheep on the hill is to all intents and purposes a dead sheep, worth nothing but the fleece, at most the "braxy," and a careful shepherd should always anticipate the scavengers to this extent. The loss of an eye may add to the pangs of a dying animal, but it takes nothing from the owner of the flock. (2) Hill-ewes lamb easily, rapidly, and without assistance. Still-born lambs are rare, and ewes that die in labour quite exceptional. The lamb is on its legs at once, and the ewe's awakened instinct of maternity constitutes a safeguard which must be seen to be believed. The stoop of the Golden Eagle at an unsuspected moment I should conceive to be irresistible, though I have never seen it; but mother ewes are much too quick for the more deliberate Crows, which, on all occasions when I have observed them, approach their quarry with considerable circumspection. (3) The natural death-rate of a hill-flock provides carrion enough and to spare for many scavengers. Taking the distribution of sheep-ground in the Highlands at from three to eight acres per sheep, and the normal death-rate of adult sheep—not counting hogs that die at winterings—at from 5 to 15 per cent. per annum, we get an average carrion output of a dozen carcasses per square mile per annum, thirty square miles giving a carcass for every day in the year, and this without reckoning the death-rate of lambs from birth (April) to weaning (August), which is understated at 10 per cent. for those four months alone. The numbers actually exceed this calculation on many west-coast farms, where a heavy death-rate follows in the wake of a heavy stock; but in any case Ravens need not kill their own meat, for nature keeps them constantly supplied. Sometimes a rotting carcass prompts one to believe that the supply is in excess of the demand.—ALLAN GORDON CAMERON (Barcaldine Castle, Ledaig, N.B.)

Larus ridibundus: Assumption of the Hood in Winter.—On Jan. 23rd last, a wild and boisterous day, with strong north-west wind and driving showers of sleet and hail, large flights of Gulls were blown inland, and were following the ploughs at work in the fields. Driving in the neighbourhood of Wells, Norfolk, I noticed, amongst a flock largely composed of Black-headed Gulls, one with an entirely black hood, which showed very plainly against the falling snow. I am aware that this early assumption of the breeding plumage has been observed at quite as early a date, but it is by no means of common occurrence.—H. W. FEILDEN.

The Birds of Surrey.—As I hope to publish a book on this subject as soon as the material collected is as complete as possible, I should be much obliged if any of your readers would draw my attention to any rare local occurrences; notes in local newspapers; local lists; old books or MSS. relating to Surrey birds; public or private local collections; names of any correspondents likely to assist; local names of species; personal observations, or any matters of local ornithological interest. I should also be glad to know whether the late Messrs. James Lewcock and Mansell, of Farnham, left any manuscripts or published lists of birds. Communications on any of these points will be gratefully accepted.—J. A. BUCKNILL (Hylands House, Epsom).

Sale of Great Auk and Egg.—The collection of birds' eggs and nests formed by Mr. Leopold Field was disposed of by auction at the well-known rooms of Mr. Stevens, in King Street, Covent Garden, on the 22nd and 23rd April last. The feature of the second day's sale was the inclusion of a very well-preserved specimen of *Alca impennis* (lot 260), with an egg (lot 261), both the property of Sir Frederick Milner, Bart., M.P., who inherited them with the collection of the late Sir William Milner. The history of lot 260, as printed in the sale catalogue, is altogether misleading, and the statement by Graham of York, to the effect that the bird was taken in the Orkneys, was (like other statements made by that dealer in regard to rare birds) wholly unreliable, although very likely credited by the late Sir William Milner. The specimen in question is in all probability the bird which Mr. A. D. Bartlett bought from a stranger for a "Northern Diver," and sold in September, 1844, to Shaw of Shrewsbury, who in turn disposed of it to Mr. Buddicom of Smethcote, Shrewsbury, from whom it passed, through Gardner, to Graham of York, who sold it to Sir William Milner as having been killed in Orkney! Having been recently re-stuffed by Cullingford of Durham, who certified to its being "a genuine specimen throughout, with not a single false feather in it," it was offered for sale as announced, on April 23rd. The bidding commenced at £100, and proceeded gradually to £350; at this point, no further bid being obtainable, the auctioneer declared it to have been bought in by the owner at £360, the reserved price not having been reached. We have since learnt that it has been sold for the Museum of Science and Art, Edinburgh, for £350. With regard to the egg (lot 261) above mentioned, the sale catalogue gives no indication of its history; but we are enabled to state, on the authority of the late Mr. Robert Champley of Scarborough, that on the 10th August, 1860, he met Sir William Milner by appointment; that Sir William then showed him this egg, and allowed him to make a water-colour sketch of it (which we have seen), and at the same time informed him that while staying at Heidelberg (qu. Dusseldorf), in the autumn of 1847, he heard that M.

Perrot, a dealer in Paris, had this egg for sale; whereupon, on his way home through Paris, he purchased it for 200 francs (£8). This statement is confirmed by a letter from Sir William Milner himself, written before 1860 (presumably in 1859), and printed by Mr. Grieve in his quarto volume on the Great Auk (p. 105), with the not very material variation that the writer was in Dusseldorf when he first heard of this egg, not at Heidelberg, as Mr. Champley misunderstood him to state. It has now once more changed hands, having been sold on April 23rd for 180 guineas to the proprietor of 'The Edinburgh Castle' in the Mornington Road, London, not the most fitting shrine that could be desired for such an ornithological treasure.

FISHES.

Boar-fish at Teignmouth.—On April 9th a specimen of the Boar-fish, *Capros apor*, was sent to me for identification from Teignmouth, S. Devon, where this fish had suddenly appeared in large numbers. It was prior to 1844 considered a great rarity in British waters, but a Penzance trawler, in July of that year, found them plentifully near the Runnel Stone, close to Land's End, and they are usually to be obtained just there. The specimen before me measures about $6\frac{1}{2}$ in. in length, and the curiously-hinged snout is capable of extension to the extent of an inch and a half.—E. AUGUSTUS BOWLES (Myddelton House, Waltham Cross, Herts).

[Attains a length of seven inches, and is called "Boar-fish" from the shape of the snout, which is capable of being greatly protruded. Small mollusca and crustacea have been found in the stomachs of those examined. First noticed as a British fish in 1825, when a specimen was captured in Mount's Bay. In 1833 some were taken at Bridgewater; in 1836, one at Teignmouth; and in March, 1842, one caught at Brighton was considered of sufficient rarity to be forwarded to Her Majesty the Queen. Since July, 1844, when about 200 were taken in a trawl off the Runnel Stone, it has been met with on various parts of the coast of Devon and Cornwall, and is now reported to be locally common between March and October.—ED.]

SCIENTIFIC SOCIETIES.

LINNEAN SOCIETY OF LONDON.

April 4th, 1895.—Mr. C. B. CLARKE, F.R.S., President, in the chair.

Graf zu Solms Laubach, and Messrs. C. A. Barber, S. T. Dunn, J. D. Haviland, and A. P. Young were admitted, and the Rev. A. Thornley, J. W. Carr, and W. H. Wilson Elliott were elected Fellows.

On behalf of Mr. W. B. Hemsley, Dr. O. Stapf exhibited some new plants from the Solomon Islands, collected by the Rev. R. B. Comins.

Mr. S. W. Silver exhibited a specimen of the New Zealand Frost-fish, *Lepidopus caudatus*, Günther, and commented upon the causes which had been assigned for the mortality to which this fish was periodically subject. Prof. Stewart, in reviewing published opinions on the subject, suggested the possibility of these fish (which in winter were often thrown up on the beach in hundreds) being attracted by the silvery brightness of the frosted banks, in the same way that birds perished from contact with the lanterns in lighthouses to which they were attracted during their migrations. Prof. Howes thought, from the published remarks of those who had written on the subject, that in some instances at least the fish supposed to be Frost-fish belonged to another species, and some confusion had been thereby created.

Mr. S. W. Silver also exhibited a large specimen of polished Totara-wood from New Zealand as illustrating the ornamental nature of a remarkable native tree which might be turned to good account, but which was being generally destroyed by burning, to clear the ground and save trouble, as was said, to agriculturists.

Mr. George Murray exhibited some calcareous pebbles formed by fresh-water Algæ, and, with the aid of the oxy-hydrogen lantern, showed the minute details of structure in specimens from different localities.

Dr. J. D. Haviland exhibited a curious collection of *Termites*, including living specimens of the White Ant of Borneo, and gave a brief account of their habits. His remarks were criticised by Mr. A. Constable, who offered some observations upon Indian species of *Termites*.

A paper was then read by Mr. H. N. Ridley on the *Cyrtandraceæ* of the Malay Peninsula, illustrated by selected specimens of some of the more remarkable species.

April 18th.—Mr. C. B. CLARKE, F.R.S., President, in the chair.

Surgeon-Capt. W. H. Elliot was admitted and Mr. W. Will was elected a Fellow.

In view of the approaching Anniversary Meeting, the election of auditors was proceeded with, when Mr. A. D. Michael and Prof. J. R. Green were nominated on behalf of the Council, and Messrs. E. M. Holmes and H. Groves on behalf of the Fellows.

Mr. T. B. Blow exhibited specimens of the river-weed *Mourera fluviatilis*, Aublet, from the River Essequibo, with observations on its life-history, and lantern-slides illustrating the natural haunts of the plant.

Mr. J. E. Harting exhibited and made remarks upon a collection of West African Lepidoptera which had been forwarded by Mr. J. T. Studley from Old Calabar, and was to be presented to the Natural History Museum, South Kensington.

Mr. Howard Saunders exhibited a specimen of the European White-winged Crossbill, *Loxia bifasciata*, which had been shot near Enniskillen,

Co. Fermanagh, in February last (Zool. p. 110), and was lent for exhibition by Mr. C. Langham.

Some photographs of English Red-deer heads, showing successive growths of antlers in the same stag, by comparison of the shed horns, were exhibited by Mr. Harting, on behalf of Mr. Lucas, of Warnham Court, Horsham.

Mr. A. Trevor Battye exhibited and made remarks upon a collection of plants obtained during his sojourn last summer upon the island of Kolguev.

A paper was then read by Mr. F. W. Keeble entitled "Observations on the *Loranthaceæ* of Ceylon," in which island the author had made a short sojourn in 1894. After remarking that in Ceylon many species of *Loranthus* have large and conspicuous flowers, with the corolla-tube brightly coloured, more or less tubular, and lobed, he pointed out that certain deviations from the typical regularity of the corolla-tube were correlated with the mode of fertilization of the flower by Sun-birds (*Nectarineæ*), and this was made clear by diagrams and some excellent coloured drawings. Discussing the mode of distribution of the seeds, Mr. Keeble first quoted the views of Engler and Prantl, and the remarks in Kerner's 'Pflanzenleben' (English edition), on the dissemination of the European Mistletoe, and then detailed his own observations in the case of tropical *Loranthaceæ*. The modes of germination of various species of *Loranthus* and *Viscum* were then described, as well as the curvature and growth of the hypocotyl, and the effect of contact on the latter, and on its suckorial disc; the paper concluding with some remarks on the forms of fruit and seed of Ceylonese species of *Loranthaceæ*.

ZOOLOGICAL SOCIETY OF LONDON.

April 2nd, 1895.—Mr. W. T. BLANFORD, F.R.S., Vice-President, in the chair.

The Assistant-Secretary read a report on the additions that had been made to the Society's Menagerie during the month of March, 1895.

The Acting Secretary, Mr. Howard Saunders, exhibited, on behalf of Lord Lilford, a specimen of the American Wigeon, lately obtained in Yorkshire by Sir R. Payne-Gallwey, Bart., as reported in 'The Field' of the 9th March last.

Mr. H. E. Dresser exhibited and made remarks on Dr. Radde's types of *Picus quadrifasciatus* and *Lanius obscurior* from the Caucasus.

Mr. Holding exhibited and remarked on some horns of cattle which showed a singular variation in colour.

Mr. Boulenger exhibited the type specimens of two new Chameleons from Usambara, German East Africa. Special interest attached to them from the

fact that they appeared to be more nearly related to the Madagascar species than to any of the numerous forms now known from continental Africa.

Mr. Walter E. Collinge read a paper on "The Sensory Canal System of Fishes," treating of the morphology and innervation of the system in the Physostomous Teleostei. Descriptions were given of eight species referable to seven genera in the families *Siluridæ*, *Esocidæ*, *Salmonidæ*, and *Muranidæ*.

Dr. St. George Mivart read a paper descriptive of the skeleton in *Lorius flavopalliatus*, comparing it with that of *Psittacus erithacus*, and pointed out a number of differences in detail.

Mr. G. A. Boulenger made remarks on some cranial characters of the Salmonoid Fishes, and expressed the opinion that there was no justification for separating *Coregonus* and *Thymallus* from the *Salmonidæ* as had been proposed by Messrs. Cope and Gill.

Prof. T. W. Bridge read a paper in which he pointed out certain features in the skull of *Osteoglossum*, and directed special attention to the existence of a peculiar oral masticatory mechanism in *Osteoglossum formosum*, distinct from that furnished by the upper and lower jaws and their teeth. The existence of an essentially similar mechanism in the Ganoid *Lepidosteus osseus* was also described, and the conclusion was suggested that the two genera offer in this respect an interesting example of parallelism in evolution.

ENTOMOLOGICAL SOCIETY OF LONDON.

April 3rd.—Professor RAPHAEL MELDOLA, F.R.S., President, in the chair.

Mr. C. J. Gahan exhibited two examples, male and female, of a rare Prioned beetle, *Chariea cyanea*, Serville, which had been kindly sent to him for examination by Mons. René Oberthür, and stated that Lacordaire was mistaken with regard to the sex of the specimen which he described in the 'Genera des Coléoptères.' He pointed out that the elytra of the male were relatively much shorter than those of the female, and that the joints of the antennæ from the third to the tenth were biramose. Mr. Gahan also exhibited two species of the genus *Decarthria*, Hope, and said he believed these were the two smallest species of Longicorns known.

Dr. Sharp exhibited the soldiers and workers of a species of Termites found by Dr. Haviland in South Africa. He stated that these insects possessed eyes and worked in daylight like hymenopterous ants, and that in habits they resembled harvesting ants by cutting grass and carrying it into holes in the ground. Dr. Sharp said that although these holes were probably the entrance to the nests, Dr. Haviland was unable to find the actual nest, even by prolonged digging; so that the winged forms were still unknown. He thought this species was probably allied to *Termes*

viarum of Smeathman, in which the soldiers and workers possessed eyes, and had been observed by Smeathman to issue from holes in the ground, and whose nest could not be discovered. Mr. McLachlan observed that it was possible there might be species of Termites without any winged form whatever.

Mr. Rye called attention to the action of one of the conservators of Wimbledon Common, who, he stated, had been destroying all the aspens on the Common. He enquired whether it was possible for the Entomological Society to protest against the destruction of the trees. Mr. Goss said he would mention the matter to the Commons Preservation Society.

Mr. Francis Galton read a paper entitled "Entomological Queries bearing on the question of Specific Stability." The author said that the information desired referred to:—(1) Instances of such strongly marked peculiarities, whether in form, in colour, or in habit, as had occasionally appeared in a single individual in a brood; but no record was wanted of monstrosities, or of such other characteristics as were clearly inconsistent with health and vigour. (2) Instances in which any one of the above peculiarities had appeared in the broods of different parents. In replying to this question, he said it would be hardly worth while to record the sudden appearance of either albinism or melanism, as both were well known to be of frequent occurrence. (3) Instances in which any of these peculiarly characterised individuals had transmitted their peculiarities, hereditarily, to one or more generations.

Mr. Merrifield stated that he received some years ago, from Sheffield, ova of *Selenia illustraria*, the brood from which produced, in addition to typical specimens, four of a dark bronze colour, and from these he bred a number of specimens of a similar colour. Dr. F. A. Dixey referred to a variety of the larva of *Saturnia carpini* with pink tubercles. He said the imago bred from this larva produced larvæ of which ten per cent. had pink tubercles. Professor Poulton said he had found larvæ of *Smerinthus ocellatus* with red spots, and that this peculiarity had been perpetuated in their descendants.

Mr. G. F. Hampson read a paper by Mr. C. W. Barker entitled "Notes on Seasonal Dimorphism in certain Species of Rhopalocera in Natal." Mr. Merrifield said he was of opinion that a record of the temperature at different seasons would be a very desirable addition to observations of seasonable dimorphism. Mr. Hampson said he believed that temperature had very little to do with the alteration of forms. At any rate, according to his experience, in India the wet-season form succeeded the dry-season form without any apparent difference in the temperature. Professor Poulton remarked that the apparent temperature as felt must not be relied upon without observations taken by the thermometer.

—H. Goss and W. W. FOWLER, *Hon. Secretaries.*

NOTICES OF NEW BOOKS.

The Anatomy, Physiology, Morphology, and Development of the Blow Fly (Calliphora erythrocephala): a Study in the Comparative Anatomy and Morphology of Insects; with illustrations from original drawings by the Author. By B. THOMPSON LOWNE. 2 vols. 8vo. London: R. H. Porter. 1890-95.

THIS work is the result of a series of investigations commenced by Prof. Lowne in 1868, and continued with brief interruptions to the present time. The two volumes, which have been appearing in parts since 1890, are now completed, and contain 776 pages, illustrated with more than 500 original drawings, and full references to 376 memoirs, which, with three or four exceptions, have been carefully studied by the author. There is a copious index containing more than 3000 references, and as the comparative anatomy of the various parts is given, the work will be found a most useful aid to the study of the anatomy of insects generally, on which subject we know of no book of similar extent.

The preparation of such a large number of illustrations as it contains has naturally made it somewhat costly (the published price being three guineas net), but the possessor of a copy will have at command a veritable *multum in parvo*, the cream of a small library on insect anatomy, elucidated and supplemented by the author's remarks, the outcome of years of laborious research.

A Year of Sport and Natural History: Shooting, Hunting, Coursing, Falconry, and Fishing; with Chapters on Birds of Prey, the Nidification of Birds, and the Habits of British Wild Birds and Animals. Edited by OSWALD CRAWFURD. With numerous illustrations. 4to, pp. i-xii, 1-331. London: Chapman & Hall. 1895.

UNDER this title Mr. Oswald Crawford, the late editor of 'Black and White,' has brought together in most attractive form a series of articles which were contributed by different writers to that journal under the heading "Field Sports and Field Studies." Seasonal phases of sport and natural history for every month of the year are presented in no less than forty-five chapters, all of which are appropriately illustrated, though in some cases the drawing is not always accurate. The sketch of a Short-eared Owl

on the point of seizing a rabbit as it escapes in a burrow (p. 70) must have been suggested by a plate in Wolf's 'Wild Animals,' wherein an Eagle Owl is depicted in a somewhat similar attitude. But the suggestion of a habit which is true of the Eagle Owl is not so in the case of the Short-eared species, which usually preys upon much smaller quarry. The Sparrowhawk on p. 73 displays a superfluity of tail-feathers, making the tail look too broad and at the same time too short in proportion to the wings. In the figures of the Marsh Harrier (p. 79), the Osprey (p. 85), and the Peregrine (p. 87) the wings are incorrectly drawn, being neither of the right shape, nor held in the right position. No Falcon ever holds its wings as depicted on the last-mentioned page, nor as shown in the case of the Hobby (p. 89).

But for these defects we are compensated in other chapters by some good figures of the human subject. A pleasing example of this is to be found in the plate entitled "Chantrey's famous shot." In this the artist has depicted a gentleman of the old school, with the tall hat of the period and long fowling-piece to match, firing through a wood at two Woodcocks crossing, both of which, as history relates, were killed at the one shot, and subsequently immortalised by being carved in white marble by the hand that slew them. Mr. Crawford has, of course, referred to some of the witty epigrams on the subject which were composed by eminent scholars of the day (1829), though he might have found some better than those selected in Muirhead's 'Winged Words on Chantrey's Woodcocks' (1857).

Strange to say, amongst all the field-sports dealt with, there is no account of Grouse-shooting; and although the habits of the Red-deer are described, as well as the mode of hunting it in Devon and Somerset, no chapter has been provided for the votaries of "Deer-stalking." In any subsequent edition this should be remedied, and yet another chapter added on "punt-gunning," by which we do not of course mean shooting wildfowl from a square-ended fishing-punt on a Norfolk broad (as depicted in the illustration facing p. 284), but the much more difficult art of approaching Wigeon, Wild Geese, and Swans in an estuary or tidal harbour by propelling a very differently shaped gunning-punt, decked fore and aft, while lying at full length amidships. This is a phase of sport which has many enthusiastic votaries, and should be adequately represented.

THE ZOOLOGIST

No. 222.—June, 1895.

MOLLUSCA INJURIOUS TO FARMERS AND GARDENERS.

BY F. V. THEOBALD, M.A., F.E.S.,

Lecturer in Agricultural Zoology to the South-Eastern Agricultural
College, Wye.

MOLLUSCS have received but little attention from an economic point of view, yet they cause a great deal of loss amongst our field and garden crops, as well as being indirectly the agents of serious diseases in sheep, which are often fatal. Curtis, in his 'Farm Insects,' refers briefly to Slugs and Snails. Miss Ormerod, in her valuable Reports, also gives a few useful notes regarding Water Snails; but there seems to be no complete account published of the injurious species.

The Mollusca that are injurious to our crops all belong to the two groups, the *Helicidæ* and the *Limacidæ*, both terrestrial in habits. The group which aids in the production of the sheep disease (liver-fluke) is the *Limacidæ* (or Water Snails), molluscs which, although abundant in water, are often found wandering upon land. It is through these *Limacidæ* that the sheep in all parts of the world become afflicted with that wasting disease produced by the liver-fluke. Although they are generally considered aquatic Mollusca, it must be remembered that most of them pass some time upon land, and may therefore be considered amphibious, whilst others scarcely go near the water.

The *Limacidæ* are found at all elevations. In our own country they are found in and around the mountain tarns of Scotland; in the Pyrenees, according to Moquin-Tandon, they are found at a height of 1200 metres. Most of the species are slow crawling creatures. Like all Mollusca, they are hermaphrodite,

and it is not unusual to see several together during the season of reproduction. All the members of the genus *Limnæus* frequent shallow and still waters or damp fields, and are most prolific and gregarious. They may be found at nearly all times of the year. The shells of these water-snails are elongated or conically oval, the spire usually produced, dextral, or turning from left to right. The body of the snail is twisted in the spiral and long; the head is very prominent; tentacles short, triangular, and depressed; the foot oblong, notched in front and rounded behind. Some species have the shell enveloped by folds of the mantle. Like many Mollusca, the *Limnæidæ* are extremely variable, one common English species, *Limnæa peregra*, having at least fourteen well-marked varieties.

In this country, and in Europe generally, the two species of economic importance are *L. truncatula* (= *minuta* of Draparnaud) and *L. peregra*. Both these species, which are cosmopolitan, are the hosts of the flukes (*Distomidæ*), especially the all-important liver-fluke (*Distomum hepaticum*), which causes the "liver-rot" in sheep. The eggs of the fluke are voided in the sheep's excreta on to the grass and around the ditches and ponds. The little infuseriform embryos coming from them pass, if they can, into the water, and are very active; if they meet with one of these two water-snails within twenty-four hours they pass into it, and there they remain, giving rise to other stages of their life-history (redia and sporocysts). These give rise to another stage, the so-called *Cercariæ*, which leave the mollusc and become free-swimming. They then encyst on the grass near the water, and, being eaten by the sheep, turn into the fluke. If these embryos did not meet with a *Limnæa* they would die, and the fluke would disappear from our sheep. Thus the importance of these water-snails can be readily seen. By far the greater number of these embryos enter *L. truncatula* of Müller, the *L. minuta* of Draparnaud) which is described below.

L. truncatula.—Shell oblong-conic, turreted, shiny, pale, horny, ashy grey, five to six whorls, which are rounded and convex, but slightly compressed in the middle, last whorl large and expanded, occupying about three-fifths of shell; spire of shell tapers to a very fine point; mouth oval; outer lip sharp, inner lip continuous with it and reflected on the columella; height about 8 mm., diameter 3 to 5 mm. This species is found over

the whole of England and France, and in nearly all European countries. It is also met with in Siberia, Afghanistan, Thibet, Amoor, Morocco, Algeria, Abyssinia, Tunisia, Canary Islands, and Færoe Islands. I do not know of its record in the Shetland Islands; the fluke, however, I think exists there. It has also been found in a semi-fossil state in various recent formations, and in the Upper Tertiary beds. It deposits its eggs or spawn upon the mud around ponds, ditches, and streams, where it lives. The eggs are laid in batches of 30 to 100, each snail laying as many as 1500 eggs during its life. The eggs are united in strips of a gelatinous consistency. In about two weeks these give rise to the young shells. Occasionally embryo flukes have been found in *L. peregra* of Müller, but they have always been in the young stage; I believe, however, that they use this species as a host in the same way that they do *truncatula*.



L. peregra. — Length about 0·75, breadth 0·425. Shell obliquely ovate, thin, and moderately glossy, almost transparent pale yellowish brown, spirally striate; striæ minute; also a few indistinct spiral ridges and marks; whorls five, last occupying three-fourths of shell; spire of shell pointed. Body pale yellowish grey, with an olive-green tinge mottled with black and covered with small yellow and white specks. Extremely abundant and variable. Found in lakes, ponds, canals, &c., wherever there is water. Like *truncatula* it may be found in Afghanistan, and abundantly in all Europe. It is a slow-moving creature, but often wanders far from any water into damp meadows, and is sometimes found crawling up willow trees. It is extremely prolific, the eggs being laid in strings of 12 to 180, and as many as 1300 in one season, according to Jeffreys. They are often carnivorous, living one upon another if kept in an aquarium. In North America *L. humilis* (Say) plays the part of intermediate host of this Trematode worm, and in Argentina *L. viator*, Orb., takes the place of our two species.

DESTRUCTION OF WATER-SNAILS.—It is of course extremely difficult to see how we can get rid of these water-snails; there is no doubt, however, that the suggestion made by Miss Ormerod, of “clearing the shallow pools of weeds and removing the broad band of weed-growth or stagnant mud from the entrance end of the pool,” would greatly lessen the quantity of water-snails. The

constant clearing out of all ditches and dykes and pools would, of course, be most beneficial, especially if the weeds and mud are burnt, so that the eggs of the snails are destroyed, or lime and salt sprinkled over the mud, so as to kill those of *truncatulus* as well as the snails themselves, and any escaped embryos of the flukes. Beyond this little else seems practicable.

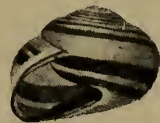
SLUGS (*Limacidæ*) AND SNAILS (*Helicidæ*).—Snails and slugs are great pests to the gardener, and every now and then a plague of one or the other makes its appearance and attacks our field crops. Both snails and slugs possess a head which bears tentacles, and also a pair of eyes which may be borne at the tip of these tentacles. The foot is flattened. Snails possess lips, but the organ they use for destroying plant-tissues is the curious swollen rasping tongue, the “radula,” the surface of which is covered by rows of variously arranged teeth. They breathe by means of the highly vascular inner walls of the mantle-cavity. Snails and slugs are hermaphrodite. The eggs are laid in batches in the ground and under stones. The injurious snails belong chiefly to the genus *Helix*. Almost every wood and hedge, field and garden yields some kind of *Helix*; others are partial to the sands near the sea, water-courses, and damp places. Their habits are nocturnal and crepuscular, and are seldom seen crawling in the daytime, unless after heavy rains. This latter habit has given rise to the popular idea that the occasional snail-plagues come in the rain-clouds. As soon as the sun shines they crawl to some shelter—under stones, moss, or beneath the leaves of the plants they attack. When the breeding season is on, the male organs of each snail are supplemented by one or more curious crystalline darts, which they thrust out at one another: these curious structures are found in special sacs (the so-called “dart-sacs”), and are peculiar to the genus *Helix*. The eggs are generally round, white, semi-transparent bodies, and are always laid in batches in slanting galleries under ground formed by the “mother” snail. The slugs (*Limacidæ*), unlike the snails, have only a rudimentary shell, or an indefinitely formed one placed under the mantle. They mostly frequent damp and shady places, and during daytime they bury themselves in tunnels under the earth. Unlike the snails, they generally deposit their eggs singly under the ground, and the eggs are very numerous. The two chief genera are *Arion* and *Limax*, the former being distinguished

by having a slime-gland in the posterior extremity, and by having the respiratory orifice in front instead of behind the shield. They both feed at night, selecting the tenderest and choicest plants, but they will devour almost anything. The *Limaces* are very fond of indoor habitations, being found in cellars and outhouses. They destroy the corks in wine-cellars, and do much damage in that way; but, on the other hand, it is said they live upon the destructive "dry-rot" fungus. They all exude a glutinous kind of slime.

The following species of snails have been brought to my notice every now and then as doing much damage to farm crops and vegetables:—

The Garden Snail, *Helix aspersa*, Müller, is a large and abundant species, often doing much harm in the garden, not only to vegetables, but even to wall-fruit. Several instances of the total destruction of peach- and apricot-leaves by this snail have been brought to my notice. The years 1884 and 1889 were remarkable for the number of this snail seen about. The eggs are laid in small batches in the earth, about sixty or seventy in each heap. The ova are white, shining, globular bodies; they hatch in about fifteen days, if kept in damp places. The young snails are almost colourless, and the shell is thin and transparent; they grow rapidly. Drought and cold are erroneously considered prejudicial to all snails: at the approach of winter they collect together and exude a slimy matter, which hardens on exposure and closes the aperture of the shell. They may then be found hibernating together in crevices in walls, in old trees, and under rubbish, united together by the agglutinated slime. I have notes of the damage caused by this snail in most counties of the south of England.

H. nemoralis, Linn., is an extremely abundant snail in hedgerows and upland pastures, and especially in clover, where it often does much damage. It has a handsome shell, subject to much variety in regard to colour, and is very hardy. It is one of the first to make its appearance in the spring, and often does much damage to young turnips and lettuce as well as clover. In the typical *nemoralis* the lip is black. The colour of shell is extremely variable, being white, grey, pale yellow, pink, or brown, with 1 to 5 spiral brown bands, occa-



sionally confluent or interrupted; whorls $5\frac{1}{2}$, convex, last $\frac{3}{5}$ of shell. The body of the mollusc is dark brown, tinged with yellow, and covered with small tubercles; mantle greenish, with yellow specks; tentacles long and slender.

A well-marked variety, at one time regarded as specifically distinct, is *H. hortensis*, which has the mouth white-lipped and the rib of the same colour. A variety known as *hybrida* has the mouth and rib of a pink colour. The arrangement of the bands and markings of the shell are extremely variable, as is also the colour of the animal itself. I have seen clover and lucerne literally stripped by this snail in Wiltshire and in Wales.

H. rufescens, Pennant, is a constant source of annoyance to strawberry-growers, preferring those plants and violets to all other plants. I have seen beds of strawberries in Surrey and Cambridgeshire quite spoilt by this snail, and the fruit is attacked as well as the young leaves. These snails are seldom seen in the daytime, unless after a shower of rain, when they at once become active. They may often be seen in summer under the straw which is sometimes placed between the plants. They deposit their eggs from September to November, each snail depositing about sixty eggs. In my breeding-case the eggs were on the ground in heaps, but I think naturally they place them below the surface of the ground. The ova hatch in about three weeks, but a few remain undeveloped until the spring. The small snails do not grow very rapidly, as is the case with *Helix aspersa*. The shell is compressed above and angularly rounded below, opaque pale dirty grey, often with a reddish-brown hue, sometimes transversely streaked with brown and marked with a white spiral band which passes round the last whorl; whorls 6—7; last whorl = $\frac{1}{2}$ -shell; mouth obliquely semilunar, furnished inside with a broad white rib. The body of the snail is yellowish brown with dark brown stripes running along the neck and on the tentacles; foot pale, narrow and slender.

H. virgata, Da Costa, often does much harm to root crops and grass lands. During the past year it appeared in large numbers in parts of Kent, where it is well known on account of its destructive habits. At Wye, on the farm belonging to the S.E. Agricultural College, this and another snail caused much loss amongst mustard plants, coming down whenever there was any moisture from the chalk downs above the farm.

H. virgata is one of the species that has given rise to the popular notion that snails come down in the rain. It is an extremely abundant and gregarious species, and may be seen in damp weather in vast numbers clinging to the plants. Directly the air becomes dry it retires into the ground amongst the herbage, and there remains hidden until fresh rain comes, when it suddenly reappears. In dry weather it becomes dispersed by the wind, particularly on the downs and sandy heaths, and especially along the sea-coast. Although, as above shown, it sometimes does much harm it is said to have the redeeming quality of imparting a fine flavour to our south-country mutton, being taken up by the sheep when grazing, and considered to be very nutritious. There is no doubt of that, though I very much doubt if they flavour the meat.

H. virgata is active in the coldest weather and does not hibernate. During the past cold winter I found, on the down at Wye, several of this species quite active. Eggs are laid in clusters of three or four from September to November and even in December. The shell is conical, with a broad and convex base, white or creamy, with a single purplish-brown band above the periphery, and sometimes as many as six or seven below it, more often two or three: the colour is very variable, sometimes plain white, brown, or grey, with white bands; occasionally the dark bands are broken, so as to make the shell appear spotted; whorls 6, last = $\frac{1}{2}$ -shell; mouth purplish inside, with a strong rib, sometimes purple, sometimes white. Several varieties are known. The body of this snail is dusky grey, and coarsely tubercled; mantle dark violet, speckled with white and brown.

H. caperata is a sluggish species which seldom moves except after rain. It is found generally under stones and wood, and on grass stalks in dry places. It is very abundant often in corn-fields. At Wye last year it was observed in large numbers with *H. virgata*. The ova, round, white, and opaque, are laid in September and October, each snail depositing about forty, which hatch in three weeks. The young are quite transparent. I have seen it doing much harm in France. *H. caperata* differs from *H. virgata* in its much smaller size, its flattened spire, its larger umbilicus, and the rib-like striæ which encircle each whorl. There are other snails which now and then become superabundant to do harm, but so far as my experience goes they are of exceptional occurrence.



Of Slugs the three most destructive species are *Arion ater*, *Limax agrestis*, and *L. maximus*.

Arion ater (Linn.), or the Black Slug, is found in damp woods, gardens, and hedges; and during the day under stones, logs of wood, and even tunnelling under ground; it reappears, however, directly after rain, and attacks all kinds of soft succulent leaves. It is a great pest in gardens and fields. At the same time it acts as a scavenger. This species has a variety of names on account of its variable colour. Férussac named it *A. empiricorum*, on account of the calcareous matter found under the shield having been used in medicines. It is also now identified with *A. flavus*, though at one time considered to be a distinct species. The shell of *A. ater* consists of small separate calcareous grains of unequal size. The colour of the body varies from black to red, yellow, green, brown, and occasionally a dirty yellowish white, covered with large prominent tubercles, often much contracted and rounded in front and somewhat pointed behind; the mantle is paler than the rest of body; the tentacles much swollen distally; foot with yellowish border; slime of a yellowish colour. The eggs, which are oval, white, opaque bodies, take about a month to develop. The young grow slowly, and apparently do not attain the adult condition until they are a year old.

Limax agrestis, Linn., the Grey Field Slug, is by far the most injurious to vegetation of all the land Mollusca. It may be found in almost every garden and field throughout this country and most parts of Europe, as well as in Siberia, Madeira, and Algeria. Like all slugs, its life is dependent on moisture. In dry weather we find it rolled up under a stone, coming out to feed by night and during wet weather. According to one authority, this mollusc feeds upon earthworms.* The body is spindle-shaped, ashy grey, with reddish or yellowish tinge, and sometimes mottled; early in the year it is of a much paler colour; the shield is large; the foot has pale sides; and it exudes an abundant viscous slime. The shell is oval and concave on under side, very thin, marked with indistinct lines of growth, with a broad membranous margin, obliquely striated.

This species is most prolific; as a rule seven or eight distinct batches are annually produced of fifty ova each. The breeding season is from May to November. The ova are deposited in

* In this case it has been probably mistaken for *Testacella haliotidea*, which preys almost exclusively on earthworms.

heaps of six to fifteen, in the ground and amongst moss. August, September, and October are the chief breeding months. A single snail will lay as many as 500 ova in the season. The eggs take three or four weeks to develop, the young being about one-twelfth of an inch long. Some that I kept reached the adult state in about two months, but they more often take much longer to reach maturity. These slugs live many years. The ova have great resistive powers as regards temperature and drought. Directly cold dry weather comes, they shrivel up and appear spoilt; but with moisture they are again distended. In this way they may be dried time after time in a stove and yet the ova will retain their vitality. Spring and autumn are the seasons when they appear most numerous. They attack cabbage, rape, wheat, clover, lettuce, turnips, in fact most vegetation. They eat the young turnips off just above the ground. In the winter months this slug may be found in large numbers under stones, decaying logs, and rubbish, in a semi-torpid condition. During the past spring they attacked the wheat in Kent, and did much harm.

Another very destructive species is *L. maximus*, Linn., the Black-striped Slug, the largest of its kind and sometimes reaches a length of seven inches. Although not very prolific it does much harm. It is very inactive, and exudes a thick gummy iridescent slime. The ova are deposited in little clusters, agglutinated by mucus, during the autumn, and in about four weeks are hatched. The young at once commence to devour the nearest vegetation. This species will live for some years; one I kept for five years continued to grow all the time. Its shell is somewhat rectangular, elongated and convex above, crystalline and glossy, with distinct lines of growth; boss small near one end; margin very thin. The body is slender, variable in colour. Some are black; others yellowish grey and spotted with black and white; numerous tubercles cover the skin; tentacles, long and yellowish-brown; back very much rounded; foot edged with white. Slime iridescent when dry, white when fresh.

There are other slugs less destructive in their habits, but the above-mentioned are the most noteworthy pests to the farmer and gardener.

METHODS OF DESTROYING SLUGS AND SNAILS.—Economically, the most important points in the natural history of slugs and snails are, first, that they chiefly live and flourish in damp places; drainage, therefore, must have a good effect in lessening

their numbers. In cases where this has been properly carried out, success has attended the experiments. Secondly, it should be noted that slugs have the power of expelling a great quantity of slime, which would naturally take up any poison in the form of powder that may be laid down in their way; and although they have the power to crawl as it were out of this slimy covering, and so leave the poison behind them, they cannot long continue to supply this mucous matter, so that if two or more dressings are applied soon after each other, the cuticle of the slug may be reached. Dressings of salt and lime are by far the most successful for destroying these pests, two or three dressings being given, the second one some ten to fifteen minutes after the first. Salt applied at the rate of four or five bushels per acre, and lime at the rate of ten to twelve bushels per acre, will clear any field of these noxious creatures, if done over *twice* in succession, salt especially having an injurious effect on the mucous membrane. It is useless, of course, to dress a field in the hot part of the day, or in very dry weather. The dressings should be applied when the slugs and snails are active, that is after heavy rains, and in the *evening* and *early* morning, before the sun is up; for as the sun rises the slugs, &c., disappear. Slacked lime has no effect upon them. Snails are more difficult to destroy, owing to their retracting their bodies into the shell and closing the aperture; and as they can live for several years without food, they offer many difficulties in the methods of destruction. Dressings of soot seem to be the most beneficial; the soot making the plant and ground obnoxious to the snails, drives them from the land. Nitrate of soda is likewise a very good dressing, both for slugs and snails, as well as for stimulating plant-growth. Snails have many natural enemies in birds. Thrushes and Blackbirds especially do much good in keeping them in check. Ducks, Starlings, Rooks, and Pigeons also eat them greedily; as do also Moles, Shrews, and Toads. Several species of mites are parasitic on slugs, but do not seem to affect them injuriously. In gardens slugs and snails may be destroyed by various traps: pieces of turnip and cabbage-leaves, spread upon the ground, collected at night, will be found to have attracted numbers from the surrounding soil; they can then be easily put into a pail of lime and so destroyed. But in the fields the only practicable way of destroying them is by dressings, as

above stated, of lime and salt, applied especially in damp weather, when these pests are most active. Several gardeners have told me they have experienced very successful results by using ordinary wood-ash, dusted over the infected plant when the dew is on the leaf. In places where the snails come from neighbouring downs or woods a small trench may be dug along the border of the field and filled with soot and lime, or better still, with salt and lime, a precaution which will prevent them reaching the crop; and if the trench be about a foot wide many of the snails and most of the slugs will be killed in it. Much good may also be done by destroying rubbish heaps, and removing stones which protect them from the heat and dryness of the air. Many ova are deposited in heaps of leaf-mould. If these heaps are dressed with quicklime, all the ova will be destroyed, as well as many other vermin certain to be present. Rockeries and ferneries in and near gardens are often centres from which numberless snails proceed. All rough herbage should be cleared off these in the winter, and in the spring a good dressing of soot put over them to kill the vermin that have hibernated there. As a means of attracting these pests there is no better plan than that of putting brewers' grains near the plants that are being attacked; both snails and slugs readily go to this and remain there. These heaps may then be removed and burnt; or quicklime and sulphur mixed together with water may be put over them, and will kill the pests which are feeding there. In this way a garden may soon be cleared of them. During the past spring the South of England has been visited by large numbers of snails and slugs. In many districts it was found almost impossible to keep the hordes of *L. agrestis* off the early peas and other early garden produce. A certain amount of success attended watering with a small quantity of paraffin in water, and with sprinkling ash soaked in paraffin. Barley-awns soaked in the same I found kept off the slugs to a great extent, the sharp points making progress difficult for them. The abundance of both snails and slugs this spring after the severe winter ought surely to dispel the popular notion that cold weather destroys molluscs and insects. The worst slug attacks have nearly always come after hard winters. No doubt this is largely due to their natural enemies, the Blackbirds and other birds, being killed, and to these "farmers' friends" being unable to attack them when the ground is hard and covered with snow.

THE MAMMALIAN FAUNA OF CHESHIRE.

BY T. A. COWARD AND CHARLES OLDHAM.

(Continued from p. 176.)

Order UNGULATA.—Family BOVIDÆ.

Bos taurus, L ; Wild White Cattle.—A domesticated herd of the old British Wild White Cattle is still kept at Somerford Park, near Congleton, the seat of Sir Charles W. Shakerley, Bart. Accounts of this herd are given in Storer's 'Wild White Cattle,' in Harting's 'Extinct British Animals,' 1880, and in the Report of the Manchester Meeting of the British Association in 1887 (pp. 135-145), from which sources much of our information has been derived. The cattle cannot be traced here for more than two hundred years, and were probably brought in the seventeenth century from Middleton Park, Lancashire, though it is possible that they may have been at Somerford since the park was originally enclosed. In June, 1887, the herd consisted of thirty animals, which had increased to forty on July 28th, 1894, the date of our last visit, when the numbers were made up as follows:—1 bull, calved in June, 1891; 14 cows; 15 head of young stock, including 3 bulls; 10 calves. The bull is a short-legged, massively built animal, with a very broad, thick-set head and heavy fore quarters. The hind quarters, as in the other herds of park cattle, are lighter than in the ordinary domestic breeds. He has hardly as much black as is usual in this herd. The poll is white, and there are no black hairs in the tail-tassel nor on the fetlocks. There are a few underlying blue spots on the shoulders and flanks, and some scattered black hairs on the sides of the face. The ears are black inside, and for about half their length from the distal end outside; the muzzle, hoofs, and eye-rims are also black. The roof of the mouth and upper surface of the tongue are black; the under-surface of the tongue flesh-coloured. A calf of the Chillingham herd, which Oldham examined in May, 1891, had the tongue similarly coloured. In December, 1887, the two oldest bulls at Somerford had black polls, and a good deal of black about the fore legs and shoulders. The cows vary much. Some are quite white, even to the ears, while others are flecked and spotted with black in varying degrees. In December, 1887, there was one old cow, a blue roan in colour; and others were so profusely

marked with black that at least one-third of their hides was of that colour. One of the young beasts has square-tipped ears, a character which originated from a cross with a bull from the Marchioness of Lothian's herd at Blickling, about the year 1876 or 1877. None of the cattle have red points, and any which are not correctly marked at birth are killed as calves. In December, 1887, one of the calves had chocolate-coloured ears, which were probably inherited from a bull from Mr. A. Cator's herd at Woodbastwick, received in exchange about the year 1879.



Prior to that date red and brown ears were unknown. Black calves are rare. In winter the cattle, especially the bulls, develop long hair on the poll and neck, which divides along the central line, and covers them like a mane. The udders are as large as ordinary domestic cows' and present a striking contrast to those of the Chillingham, Chartley, and Cadzow animals, which, of course, are never milked. The teats are black in some cases, white in others. The herd is a polled one, but one heifer has a pair of well-developed horns, which are black-tipped and up-standing like the Chillingham type. This animal was noticeably wilder and more difficult to approach than the others. The cows are regularly milked, and we can testify to the excellence of the

milk and butter, which have the reputation of being second to none in the county. A yield of twenty-four quarts per diem is not unusual; and one cow is stated, on the authority of Mr. J. Hill, to have yielded the extraordinary quantity of thirty-three quarts per diem, but the drain on her constitution proved fatal in about four months, in spite of everything that could be done in the way of feeding. No steers are raised, all surplus bull-calves being fed for veal. The cattle when fattened for beef weigh up to fifteen scores to the quarter, and the meat is said to be excellent both in quality and flavour. The calves, as we have also observed as Chillingham, Chartley, and Cadzow, are even of a more snowy white than the adults. Though wild at first they soon become tractable, but, if allowed to run in the park soon after birth, they are not easily reclaimed. During winter the cows are housed at night, and supplied with hay, meal, and potatoes; no turnips are given on account of the flavour they impart to the milk. The cattle have the run of about 180 acres of the park, which consists of fine upland turf sloping down to the river Dane. In dry summers, when the river is low, cattle have crossed both ways, but calves of the park cows are kept, if correctly marked, even when the presumptive sire is an ordinary bull. The whole herd will sometimes gallop to a pond in their enclosure, and enter the water till little but their heads remains visible. In concluding our notice of this herd we wish to acknowledge our indebtedness to Sir Charles Shakerley and his agent, Mr. J. Hill, through whose kindness and courtesy we were afforded every facility for examining the cattle, and obtaining the photograph here reproduced.

The cattle which had been kept for centuries in Lord Newton's park at Lyme ceased to exist in 1885. When Coward saw them, in 1884, there were only three animals left, and owing to too close breeding and other causes the herd had been in a declining state for some years prior to that date. An unsuccessful attempt was made to perpetuate the herd by the infusion of new blood in the shape of a bull which was obtained from Chartley about the year 1871. The Lyme cattle, which were larger than those of any of the existing park herds, were white with black muzzles and hoofs, and frequently had some black on the fore legs; the ears were black or red, and occasionally white; the horns yellow tipped with black. In the ferocity of their

disposition and their untamable nature, as well as in many of their habits, these cattle resembled those of the more widely known Chillingham herd. Further and more detailed accounts of the Lyme cattle have been given by Storer (*op. cit.* pp. 245–253), Mr. A. H. Cocks (Zool. 1878, pp. 277–279), and Chas. Oldham (Zool. 1891, pp. 81–87). The following account is given by Storer (*op. cit.* p. 111) of a herd which formerly existed at Vale Royal, near Northwich:—"Here was an ancient domesticated herd of white cattle with red ears, which, though now crossed out and extinct, was kept up, partially pure only, in the time of the late Lord [Delamere]. They are supposed to have belonged to the Abbey; and a singular tradition, the truth of which the late Lady Delamere believed she had verified, was prevalent, to the effect that some of Cromwell's troopers drove off most of them, but that one cow, after having been driven with the rest seven or eight miles, escaped from them and returned home. They were white with red ears, and were in all probability derived from North Wales, as from thence the original monks of Vale Royal came."

Family CERVIDÆ.

Cervus elaphus, L.; Red Deer.—Remains of this species have been found in the bed of the Manchester Ship Canal at Wallasey, Rostherne Mere, and elsewhere, and there is abundant documentary evidence to show that it was formerly common in the Cheshire forests. At the present time herds of Red-deer exist in three parks in the county. In Lord Newton's park at Lyme there are about 170 head of rather small but stoutly-built deer, and there is little doubt that they are the descendants of those originally emparked. The average weight of the stags in this park is 220 lbs., and the hinds 120 lbs. From 80 to 90 head are kept in Lord Egerton's park at Tatton; and about 30 head at Doddington, the seat of Sir Henry Delves Broughton, Bart. (see Whitaker, 'Descriptive List of the Deer Parks and Paddocks of England,' 1892, pp. 28–32). Mr. J. E. Harting writes:—

"In your account of the Red-deer which are maintained at the present time in Cheshire parks, I think it would be of interest to refer to a curious custom which was observed in the last century at Lyme. In this park, 1700 acres in extent, the deer in summer time used to be collected in a herd and driven across a pool before the house, in order that while swimming they might be the more

easily counted. A scarce print of this, of which I am fortunate enough to possess a copy, was published in 1745. It is engraved by F. Vivares from a painting by T. Smith, and measures, without the margin, $20\frac{1}{2}$ in. by 15 in. The inscription is, 'A view in Lyme Park (with that extraordinary custom of driving the stags), the property of Peter Legh, Esq., to whom this plate is inscribed by his most humble servant, T. Smith.' In the middle distance the deer are seen swimming the pool, their heads only above water; in the foreground three have landed, two of which, rearing upon their hind legs, are playfully striking at one another with their fore feet; on the further side of the pool Mr. Legh and his lady, mounted on horseback and accompanied by the park-keeper, Joseph Watson, also mounted, are contemplating the scene, while beyond them we get a glimpse of the great vale of Cheshire and Lancashire extending to the Rivington Hills in the far distance.

"How long this custom continued to be observed I know not, though the present owner of the park might be able to say; but we may assume that it survived, at all events, until the death of the park-keeper, Joseph Watson above named. It is recorded on a monument at Disley that the art of driving the deer was first perfected by him, and that he died in 1753, at the age of 104, having been park-keeper at Lyme more than sixty-four years. Shirley, who mentions this circumstance in his 'Account of English Deer Parks' (1867, p. 207), adds that Watson once undertook, at the bidding of his master, to drive twelve brace of stags to Windsor Forest for a wager of 500 guineas, which he performed accordingly.

"This custom, however, of driving the deer was not confined to Lyme Park, as may be gathered from Dr. Whitaker's remarks concerning Townley, the seat of a collateral line of the Legh family in the adjoining county of Lancaster. See Ormerod's 'Cheshire,' vol. ii. p. 339.

"Playford also, in his 'Introduction to the Skill of Music,' 1655, referring to the fondness of deer for musical sounds, relates that, travelling some years previously in Cambridgeshire, he met on the road near Royston a herd of about twenty bucks, which were following a bagpipe and violin, and in this manner, he says, they were brought out of Yorkshire to Hampton Court. Long before that date, however, Edmund Bert, in his 'Treatise of

Hawks,' 1614, had written:—'Have not wilde stags by watching and manning been driven like cattel upon the way? What is it that man cannot effect if he will thereunto apply himself.'

Cervus dama, L.; Fallow Deer.—Such works as Ormerod's 'History of Cheshire' contain many references to this species, which was abundant in mediæval times. Mr. J. Whitaker (*op. cit.*) mentions ten parks in which herds of semi-domesticated Fallow Deer are now kept, *viz.*:—Tatton (Lord Egerton), 500 to 600 head; Eaton (the Duke of Westminster), 300; Oulton (Sir Philip Egerton), 250; Cholmondeley (the Marquis of Cholmondeley), 200; Carden (Mr. J. H. Leche), 160; Doddington (Sir Henry Broughton), 150; Adlington (Mrs. Legh), 70; Dunham (the Countess of Stamford), 70; Lyme (Lord Newton), 35; Beeston (Lord Tolle-mache), 20.

Order CARNIVORA.—Family CANIDÆ.

Canis vulpes, L.; Fox.—Strictly preserved throughout the greater part of the county, and consequently a great pest to the game-preserved and farmer. On the Longdendale moors Foxes are very destructive to the brooding Grouse, and, as the country is not suitable for hunting, great numbers are killed by the game-keepers. Between thirty and forty were destroyed on these moors in the winter of 1893–94.

In 1890 a vixen reared her litter on an island in Chapel Mere, Cholmondeley Park, Malpas, and was obliged to cross more than twenty yards of water each time she fed her family. When the cubs were old enough to leave their dam she was seen to swim to the shore, carrying them one by one in her mouth (C. Macdona, 'Field,' July 26th, 1890, p. 160). Mr. R. Newstead (*in lit.*) refers to the Fox's partiality for eggs, and states that he has known eggs to be carried away and buried in the earth without being broken. In the accounts of the Chapel-wardens of Holmes Chapel we find that in 1717 and 1722 one shilling was paid for a Fox's head to Joseph Allen (T. Worthington Barlow, 'A Sketch of the History of the Church at Holmes Chapel, Cheshire,' 1853).

Family MUSTELIDÆ.

Martes sylvatica, Nilsson; Marten.—Practically extinct in Cheshire. Byerley records two. The first was killed early in the forties, in the township of Whitby, by a gamekeeper (Robinson), in the service of the Marquis of Westminster. The second, trapped at Hooton in Wirral a few years later, was sent to Mather, the

Liverpool taxidermist, for preservation, by Sir Thomas Stanley. The late J. F. Robinson recollected, as a boy, seeing one which was trapped in the Royalties, near Frodsham; and saw another treed by the foxhounds at Eddisbury Hill, in Delamere Forest ('Manchester City News,' Feb. 9th, 1884, quoted in Zool. 1891, p. 452). Mr. R. Newstead (*in lit.*) states that a Marten was killed in 1876 in some farm-buildings at Hassal, near Sandbach, but was not preserved. He has been informed, on what he considers to be trustworthy evidence, that another was seen in the spring of 1882, on a farm at Thornton-le-Moors. Our latest and most interesting record is in Mr. Newstead's list, and refers to a Marten which was shot in the pheasant-field at Eaton Park on July 7th, 1891, and is now in the Grosvenor Museum, Chester.

Mustela putorius, L.; Polecat; Fomart; Fitchet. — Though the Weasel and Stoat still hold their ground, in spite of incessant persecution, the Polecat is practically extinct in Cheshire. To the present generation of gamekeepers and farmers the animal is almost unknown, and the older men remember it only as having occurred in their youth. The Rev. C. Wolley-Dod, of Edge Hall, Malpas, states (*in lit.*) that during a twenty-five years' residence in the county he has never heard of a Polecat. Colonel Dixon, writing from Astle Hall, Chelford, says he has heard of none during recent years. Captain W. Congreve, of Burton Hall (Wirral), states (*in lit.*), "Some fifty years ago we often caught Fitchets in steel-traps, but none exist here now." Byerley speaks of the Polecat as "occasionally found in Wirral; formerly common." Mr. Newstead's list contains no Cheshire records. In the 'Manchester City News' for June 10th and 17th, 1882, the late J. F. Robinson gave an account of a hunt in Delamere Forest, in which he took part, about twenty years before that date; but the Polecat appears to be quite extinct in that district now. Mr. H. H. Corbett, of Doncaster, states (*in lit.*) that he saw a Polecat in a "keeper's museum" at Bramhall some time between 1866 and 1870, and that he found a half-grown example in a trap at the same place about the same time. Mr. H. P. Greg, of Handforth, writes, under date May 24th, 1894:—"Our old keeper, Brown (who died ten or twelve years ago), killed a Polecat within half a mile of this house, in the Ringway direction, thirteen or fourteen years ago; and our present keeper, Joshua Pearson, killed one just on the Moberley

side of Burley Hurst four years ago." The Rev. J. E. Kelsall's note (Zool. 1893, p. 102) appears to refer to one of these two, but there is a discrepancy in the dates. We have examined a specimen in the possession of Mr. Alfred Salmon, which was killed in the Bollin Valley, near Bowdon, about five years ago. In the early part of the present century the Polecat was hunted regularly at night by a scratch pack of dogs in the neighbourhood of Northenden and Baguley, and Mr. Thomas Worthington, of Wythenshawe, informs us that an old farmer at Gatley once showed him a small bell, which was hung round the neck of the leading dog, and which he treasured in memory of many nights' sport in which he had participated. Mr. Worthington states that no Polecats have been seen on the Wythenshawe Estate, near Northenden, since the year 1856, when one was caught in a rabbit-trap.

M. vulgaris, Erxl.; Weasel.—Common and generally distributed. This species is usually reported by gamekeepers to be less common than the Stoat, but this is probably owing to the fact that it seeks its food principally in the runs of Voles and Field-mice and the galleries of the Mole, whereas its larger congener preys upon rabbits and game, and is therefore more frequently taken in the keepers' traps. Mr. Newstead, however, says (*in lit.*) that in the neighbourhood of Chester the Stoat is certainly the commoner species.

M. erminea, L.; Stoat.—Common and generally distributed. The Stoat is often called "Foumart" in Cheshire. Examples in the white winter pelage are frequently taken on the hills of the eastern border, and are by no means rare on the Cheshire plain. All that we have seen, however, retained a few patches of brown hair on the face and shoulders.

Meles taxus (Schreb.); Badger; Brock.—The Badger is by no means extinct in Cheshire, and is even common in certain districts. In Wirral it appears to be rare. Byerley mentions one that was killed near Hooton about the year 1848, and states that many years prior to the date of his list examples had been obtained at Oxton Hill, Caldy, and Moston Hall, near Chester. Captain W. Congreve informs us (*in lit.*) that one was shot near Burton in June, 1893. Mr. Newstead says:—"Thirty years ago this fine animal was common in Delamere Forest, on the Manley side of which there must have been a large colony of them, as traces of their burrows still remain, and the place is called

'Boger Bonk' (Badger Bank) by the natives to this day. About the year 1885 a very old specimen was taken in the above locality by some poachers." He also records examples from Broxton (1885 and 1892), Eaton Park (1887), and Oulton Park (1888); and informs us (*in lit.*) that Lord Arthur Grosvenor obtained one at Broxton in March, 1894; and that one, which was sent alive to the Grosvenor Museum, Chester, was dug out by the Hon. Cecil Parker at Cotton, near Waverton, in May, 1894. Another example was seen at the same time, but not obtained. The Rev. C. Wolley-Dod, of Edge Hall, Malpas, states (*in lit.*, Aug. 28th, 1893), "Badgers are common in the woods in this part of the county"; and we are informed that they may still be seen occasionally at Tushingham-cum-Grindley, in the same district. Colonel Dixon, of Astle Hall, Chelford, writes on March 16th, 1894:—"Within the last few years Badgers have become very plentiful about here. Three or four years back my keepers shot one, and I have seen two that have been killed within the last few years by trains on the railroad; they and the Foxes seem to live amicably together, often in the same holes, but they make a great mess in the coverts where they have their earths, as the soil here is so sandy." At Lower Peover one was dug out in the autumn of 1891 or 1892, and was kept alive for some weeks by a fishmonger in Knutsford. In the 'Manchester City News' for Oct. 28th, 1893, an anonymous writer states that several Badgers have been taken during recent years at Minshull Vernon, near Middlewich. Badger Clough, near Disley, and Badger Bank Farm, near Peover, may be cited as place-names connected with the present species. Dr. H. Colley March, of Rochdale, informs us that Brock is known to have been a personal name in Cheshire as far back as 1577, and suggests that Broxton was the stead or enclosure of the man Brock rather than of the animal from which his name was derived.

Lutra vulgaris, Erxl.; Otter.—The Otter is still fairly plentiful in the Cheshire streams and meres, and is even taken sometimes in the polluted waters of the manufacturing districts. One, killed in the river Tame at Reddish Vale on Sept. 14th, 1890, is preserved in the Vernon Park Museum, Stockport. At the present day it is rare in Wirral, and the increased traffic will account for its disappearance from the tidal waters of the Mersey; but it still holds its own, in spite of persecution by fishermen, in such

streams as the Dee, Weaver, Gowy, Bollin, and Dane, and in many of the meres. An adult female was killed by an express train near Balderston, Chester, on Feb. 24th, 1894 (R. Newstead, *in lit.*). In February, 1886, an unusually large Otter, weighing 30 lbs. and measuring $48\frac{1}{2}$ in., was killed in the Weaver at Wrenbury (F. V. Starkey, 'Field,' Feb. 20th, 1886).

Family PHOCIDÆ.

Halichoerus gryphus (Fab.); Grey Seal.—There is a specimen of this Seal in the Brown Museum, Liverpool, which was captured in the Canada Dock in the winter of 1860-61 (T. J. Moore, 'Report ii., Liverpool Marine Biology Committee,' p. 136).

Phoca vitulina, L.; Common Seal.—Byerley states that the Common Seal has occasionally been captured in the Dee and Mersey. Moore never had an opportunity of examining a local specimen, and does not include it in his list of the Seals and Whales of Liverpool Bay; but the majority of the Seals which have been observed in the district from time to time, probably belong to this species. There is a specimen in the Warrington Museum that was shot by William Mather at the mouth of the Gowy (Charles Madeley, *in lit.*). The stuffed skin of another specimen, which frequented one of the sandbanks near Hilbre Island for some time during the winter of 1893-94, is preserved in a fishmonger's shop in Liverpool (Dr. Herdman, *in lit.*).

Cystophora cristata (Erxl.); Hooded Seal.—A Hooded Seal was captured on the Mersey shore, at Frodsham, on Feb. 3rd, 1873, and was exhibited alive in Widnes. It is now preserved in the Brown Museum, Liverpool (T. J. Moore, *loc. cit.*, p. 137).

(To be continued.)

OBSERVATIONS ON BIRDS IN MID-WALES.

BY J. H. SALTER.

(Continued from p. 184.)

LIMICOLÆ.

CURLEW, *Numenius arquata*. A few upon the coast and many in the Dovey through the winter. Often noisy after dark in March, when they are probably passing inland to the hills. By the end of that month they have reached their breeding quarters, and are scattered rather locally over the hills, preferring bog-

land. Numbers also nest upon the low-lying Borth and Teifi bogs, whilst those nesting in the hills fly to the Dovey to feed at low tide. Upon the bogs they may be seen to mob Carrion Crows with much spirit, mounting above them and stooping almost in the style of a Hawk. Though most of the eggs are hatched by May 20th, a young one which I caught could barely fly on June 30th.

WHIMBREL, *N. phæopus*. The spring passage begins with great regularity within a day of the 3rd of May, and lasts through the greater part of that month; while in 1894 I heard the note as late as June 21st. Few or none are seen on their return passage in August.

BAR-TAILED GODWIT, *Limosa lapponica*. Used to be plentiful in the Dovey, but its numbers, like those of all the migratory waders, have fallen off. Still seen at times in good large flocks in August and September. Mr. F. T. Fielden only saw two in 1894.

BLACK-TAILED GODWIT, *L. algocephala*. One only, an immature bird, in the possession of Mr. F. T. Fielden.

GREENSHANK, *Totanus canescens*. Small parties of not more than four are seen fairly frequently on the Dovey in August. Mr. F. T. Fielden has seen a Greenshank at one of the lakes in the hills in April or May.

WOOD SANDPIPER, *T. glareola*. Capt. G. W. Cosens has a specimen which he obtained at Glandovey.

REDSHANK, *T. calidris*. A few in the Dovey and Barmouth river, but more numerous about the muddy inlet at Mochras Island, near Harlech. It may breed there, as I saw a flock of twenty-five on July 2nd, 1893.

GREEN SANDPIPER, *Helodromas ochropus*. Mr. F. T. Fielden has seen one at the same spot for several years upon the Dovey. One shot at Clarach is preserved at Gogerddan.

RUFF, *Machetes pugnax*. Only two occurrences. One was shot by Mr. Hooton near Borth; the other preserved by Mr. Hutchings.

COMMON SANDPIPER, *Totanus hypoleucus*. Breeds upon all the hill-streams and beside the llyns. Arrives with great punctuality, generally on April 22nd. On May 31st, 1893, sitting had not begun, as the birds were still in pairs, the males trilling and tripping about with both wings raised vertically, or with one held up flag-wise. Young birds frequent the Ystwyth in August.

SANDERLING, *Calidris arenaria*. Large flocks visit the Dovey in August, and are seen again, often with Ringed Plover and Dunlin, in April and May. A few may stay the winter, as I saw one on Jan. 9th, 1893.

LITTLE STINT, *Tringa minuta*. Occurs now and then upon the Dovey about the end of September. Mr. F. T. Fielden, who has specimens, saw two in 1894.

PURPLE SANDPIPER, *T. striata*. Met with every winter, singly or in pairs, but is far from numerous.

DUNLIN, *T. alpina*. Common on the Dovey through the autumn and winter, remaining till April or May. A very large flock, with Ringed Plover, seen on May 26th, 1893, may have consisted of non-breeding birds. Nests in some numbers on the Teifi Bog, where, as already recorded, I found eggs on May 13th, 1893. Others seen during May and June about the margins of some of the lakes in the hills were evidently nesting in the vicinity.

CURLEW SANDPIPER, *T. subarquata*. Occurs on the Dovey, usually in September, its numbers varying from year to year. In 1891, or the previous year, Mr. F. T. Fielden obtained a number, and saw one flock of from twenty-five to thirty.

KNOT, *T. canutus*. Large flocks sometimes come to the Dovey for a short time during the first three weeks of September, but its visits are very uncertain. There is one in summer plumage at Gogerddan.

WOODCOCK, *Scolopax rusticola*. Common, but I have failed to hear of any instance of its breeding. At Peniarth Mr. F. Abel flushed four from under a single bush.

GREAT SNIPE, *Gallinago major*. Not very uncommon. Mr. Hutchings has preserved at least three. Capt. G. W. Cosens has an example which was obtained in September, 1891. A specimen at Gogerddan is mounted so as to show the large amount of white in the tail.

COMMON SNIPE, *G. cœlestis*. Breeds sparingly in the hills, but plentifully upon the Teifi Bog. Here at dusk the air seems full of its bleating and buzzing.

JACK SNIPE, *Limnocyptes gallinula*. Fairly numerous.

GREY PHALAROPE, *Phalaropus fulicarius*. Occurs in autumn when driven out of its course while on passage. Mr. Hutchings received seventeen after rough weather between Oct. 15th and 24th, 1891. Mr. F. T. Fielden has met with it twice at Borth.

TURNSTONE, *Streptilas interpres*. About the first of the waders to arrive from the North, coming during the first week in August. They pass on almost at once. A few have been obtained in full summer dress.

LAPWING, *Vanellus cristatus*. Breeds very sparsely in the hill-districts, seeming to prefer fallows and the sand-links of the coast.

GREY PLOVER, *Squatarola helvetica*. Visits the Dovey in decreasing numbers, generally at the end of August or beginning of September.

GOLDEN PLOVER, *Charadrius pluvialis*. Breeds very sparsely on the slopes of Plynlimmon, and in other parts of the hill-district; more plentifully upon the Elan Moors, near Rhayader. Occurs at Aberystwyth during rough winter weather. Visits the Dovey from September to May, large flocks usually arriving there with the first snow; but if frost continues they soon leave. They are generally very wild.

DOTTEREL, *Eudromias morinellus*. Mr. Hutchings informs me that a Dotterel was shot by the late Mr. Richards, of Penglais, Aberystwyth, upon the Bryn-y-môr fields.

RINGED PLOVER, *Ægialitis hiaticula*. Very numerous as a breeding species along the greater part of the Merionethshire coast, and about the warren at Borth, south of which point the coast is unsuitable, and only an occasional pair is to be found. Last year but few had arrived on April 9th; the majority were still in flocks on the 30th, laying not being general till the middle of May.

OYSTERCATCHER, *Hæmatopus ostralegus*. Breeds commonly on the beaches and warrens of the Merionethshire coast, and to within about a mile of Borth. Scattered pairs nest at intervals along the Cardiganshire coast upon rocky points, islets, and stacks. Non-breeding birds are seen in flocks all through the nesting season.

CREAM-COLOURED COURSER, *Cursorius gallicus*. The example obtained at Ynyslas, near Borth, in Cardiganshire, by Mr. Horton, in October, 1886, has been sufficiently recorded (see 'Zoologist,' 1887, p. 269).

(To be continued.)

NOTES AND QUERIES.

MAMMALIA.

The proper Specific Name of the Weasel.—The editorial note appended to my remarks on this subject obviously demands an immediate reply, for the question at issue is particularly one which should be settled as soon as possible. Every one will agree that the proposed change of name “ought not to be too hastily accepted,” and feeling this I have pondered on the subject, off and on, for about a dozen years, in the vague hope that the obvious suggestion as to Linnæus’s “*Mustela nivalis*” being a small female Stoat might turn out to be correct. Such drifting on, however, is one of the main causes of the present confusion in zoological nomenclature, and the sooner such a question is cleared up the better. In deference to those who may think that long usage of a name has a bearing on the question whether it be the correct name to use, it may first be pointed out that such “use” should be sole use, which is not the case in the present instance. On the contrary, nearly every Scandinavian naturalist of repute has actually used *nivalis* for the Weasel, while (which is vital) those who have not, have all without exception put *nivalis* (or at least “snömus”) among its synonyms. And this is equally the case with other continental naturalists, not excepting Blasius, whose volume on European mammals remains the standard work on the subject. In fact, with the exception of the Editor, I have failed to find one single writer who seriously considers *nivalis* to be a synonym of *ermineus*. But the real question is not that of the name *vulgaris* having been “120 years in use,” but whether the characters given by Linnæus best fit the female Stoat, as suggested by the Editor, or the Weasel in its winter dress. As the Swedish Weasel must of course be mainly considered, I extract the following from Prof. Lilljeborg’s ‘Sveriges och Norges Rygggradsdjur,’ the latest and best work on the subject (vol. i. p. 508):—“Äldre individer hafva i denna dräkt icke sällan några på svartaktiga hår i yttersta svansspitsen”: that is to say, “Old individuals [of “*Mustela nivalis*”] have in this [winter] dress not infrequently some few blackish hairs at the extreme tip of the tail”; and words to the same effect occur in other diagnoses of the species. Can anything better correspond to Linnæus’s account, quoted by the Editor, “caudæ apice vix pilis ullis nigris”? Even in Britain occasional specimens of the Weasel occur with black tips to their tails, a fact which such a student of British mammals as the Editor might have been aware of. As to changing white, the Weasel throughout the northern portions of its continental range habitually turns to white every winter. The name *nivalis* I have always supposed to have been a latinization of the Swedish *Snömus*, a colloquial term quoted by every Scandinavian writer;

but Mr. Harting is no doubt right in saying that Linnæus may also have been influenced by the colour. No one can lament the necessity for changing familiar names more than I do; but I feel perfectly convinced that the sooner we boldly make such changes as are demanded by the laws of priority, the sooner we shall attain stability in nomenclature. I do not quite understand the meaning of the last paragraph of the editorial note about the transference of the Weasel from the genus *Mustela*, in which Linnæus placed it, to the genus *Putorius*. *M. martes* was the type of the genus *Mustela*, of which the first division was made by Cuvier, who gave the name *Putorius* to the Stoats and Weasels; but I do not know whether we are to infer from the editorial that Mr. Harting considers the Martens and Weasels to be congeneric. If not, I cannot understand his objection, as presumably he would sanction the transference of the Otter from the genus *Mustela*, in which Linnæus placed it, to the genus *Lutra*, and the same with the Badger and the rest.—OLDFIELD THOMAS.

[If it be the fact, as stated, that the Weasel occasionally has a black tip to the tail, or at least black hairs in the tip of the tail, and also habitually turns white in winter throughout the northern portion of its continental range, it is, of course, possible that Linnæus's description of *Mustela nivalis* may apply to the Weasel, instead of to the Stoat as most people would naturally infer on reading the diagnosis; but the point being in doubt, we should prefer to leave the specific name of the Weasel, *vulgaris*, unchanged. In the course of thirty years' experience (1865—1895), after shooting in almost every part of the British Islands, and examining the vermin killed and hung up by gamekeepers, we have never recognized a Weasel with any conspicuous black hairs in the tail; and the very few white ones we have seen were albinos, not necessarily killed in winter. As to the removal of the Weasel from the genus *Mustela*, naturally, we now-a-days regard the Martens as generically distinct from the Weasels and Stoats; but as the late Mr. Alston, whom Mr. Thomas professes to follow (p. 177), placed the Martens as Nilsson did, in the genus *Martes*, as other writers have done before and since he wrote (P. Z. S., 1879, p. 468), we should have been content to leave them there.—ED.]

The Irish Stoat in the Isle of Man.—It will interest all students of British Zoology to hear that a specimen corresponding in every respect with typical examples of *Putorius hibernicus* has been presented to the British Museum by Mr. P. M. C. Kermode, of Ramsey, who had received it from Lewaigue, near that town. This fact confirms Mr. Kermode's view (Zool. 1893, p. 61), that the Manx fauna is more nearly related to that of Ireland than that of Britain, although it should be confessed that the Hare found there (also sent by Mr. Kermode) is the Brown and not the Alpine Hare. It now becomes more important than ever that Stoats from the parts of Britain nearest to Ireland should be properly examined; and

specimens from the south-western parts of Scotland, Galloway, the Lake region of Cumberland, Anglesey, Cornwall, and the Scilly Islands, will be most gratefully accepted. Should Stoats from any of these localities show an approach to the Irish form, it will render it probable that the latter should be looked upon as a geographical subspecies, well marked in its own locality, but grading elsewhere into another form. No British specimens as yet seen, however, have shown the smallest tendency to such approach.—**OLDFIELD THOMAS** (Natural History Museum).

Bank Vole in Bedfordshire.—I have often noticed Voles frequenting hedgerows in Bedfordshire that I suspected were of this species, and in April last, whilst spending a few days in that county, I was able to confirm my views by trapping several specimens in different localities.—**J. S. ELLIOTT** (Dixon's Green, Dudley).

Food of the Bank Vole.—*A propos* of the remarks on this subject by Mr. Teesdale (p. 186) I may mention that, in the autumn of 1869, during a short visit to Hampshire, I noticed in the cornfields near Alresford a number of heaps of the carpels of *Ranunculus repens*, many of which contained a good handful. All the carpels had a minute semicircular piece bitten out of the margin. In every instance of the many I examined the seed had been extracted, and although the sides of the carpel had obviously been opened, they were not separated from each other, but had firmly come together again. I had no doubt that the seeds had been eaten by mice, but could not determine to what species they belonged. The exceeding delicacy of this operation seemed to indicate that it was one of the smaller kind, *e. g.*, the Field Mouse, but there were no holes of these in the immediate vicinity of the heaps, which were most numerous near the outside of the field. It is possible that they were brought together by the Bank Vole, but it seems unlikely that it would eat such small seeds, or that it would deal so cleverly with them. It would be interesting if some resident in that district could solve the question.—**JOHN LOWE** (4, Gloucester Place, Portman Square).

BIRDS.

Rooks in London.—Some time ago I had to report (Zool. 1889, p. 27) the almost total disappearance of Rooks from the West End of London. I think I may now state that they have not quite deserted that part of London, although their behaviour has been somewhat erratic. The birds left Kensington Gardens for the simple reason that their nesting trees were cut down. They resented the insult, and though there were plenty of available trees close by, they forsook the locality until 1892, when a solitary nest was built in the south-western corner of Kensington Gardens. In the following year, however, a strong colony took up their quarters in the trees bordering the Bayswater end of the Broad Walk, that is, the north-western

corner of Kensington Gardens. There were some fifteen or sixteen nests; at the same time some eight or ten nests were built in Connaught Square; five in Stanhope Place; and two in a plane-tree in Albion Street. When I saw this I quite thought that the re-establishment of the Rook at the West End was a *fait accompli*; but, alas, it was not so. In 1894 the birds returned to their breeding-place in Kensington Gardens, but when they had partially built their nests they suddenly disappeared, and the site was absolutely deserted and has not since been re-occupied. At the same time (1894) Albion Street and Connaught Square were deserted. I can, however, state that the little colony at Stanhope Place this year consists of *three* nests, and there are five nests in Connaught Square.—JOHN YOUNG (64, Hereford Road, Bayswater).

Food of the Firecrest and Little Bustard.—A female Firecrest, *Regulus ignicapillus*, which I dissected last October, had been feeding on minute beetles. A little Bustard, *Otis tetrax*, contained a great quantity of larger beetles and grasshoppers, in addition to what appeared to be the tops of turnips.—HUGH A. MACPHERSON (Carlisle).

The Food of Woodpeckers.—The nature of the food of American Woodpeckers has been investigated by Mr. F. E. L. Beal from an examination of more than 600 stomachs. He has found that the Hairy and Downy Woodpeckers (*Dryobates villosus* and *pubescens*) feed chiefly on harmful insects, eating also wild fruits and seeds. The Flicker (*Colaptes auratus*) subsists largely on ants, of which insects more than 3000 were contained in each of two stomachs. This species also eats other noxious insects and some wild fruit. The food of the Red-headed Woodpecker (*Melanerpes erythrocephalus*) is largely insects, nearly all harmful, with wild fruit and some corn and cultivated fruit. The Yellow-bellied Woodpecker, or Sapsucker (*Sphyrapicus varius*), feeds largely on the inner bark and sap of trees, eating also ants and other insects, and is the only species taking more vegetable than animal food.

Crossbill feeding on Insects.—In 'The Zoologist' for 1890 (p. 414), a reference will be found to the common Crossbill feeding on aphides. In May of the present year four adult Crossbills were brought to me, which had been shot out of a large flock. On dissecting these birds I found that they had been feeding upon small flies and minute beetles, in addition to the seeds of a conifer. The insects in question were numerously represented.—H. A. MACPHERSON (Carlisle).

Cuckoo's Egg in Wren's Nest.—In the early part of May I found a Cuckoo's egg in a Wren's nest. The nest was placed in the usual position—beneath the matted and exposed roots of a tree in the channel of a water-course. The egg did not sufficiently assimilate those of the Wren to be remarkable; but there was a curious zone of a lighter colour than the rest

of the egg round the middle, and a darkening of the smaller end, which were noticeable. Strangely enough, when passing the spot some three weeks later, I found another Wren's nest within a few yards of the former one, in which was another Cuckoo's egg in addition to three of the rightful owner. Being somewhat curious to ascertain whether there was any peculiarity in the two Cuckoo's eggs which would indicate their common parentage, I took the second specimen home and compared it with the other, with the result that I found an almost perfect uniformity both in size and colour. Now, however doubtful be the significance of the former fact, it must be admitted that the latter is at least suggestive; as, although the eggs of different individuals of the same species may be so variable as to render the circumstance of two being found of the same size but a slender basis for identifying them with the same bird, yet the manner in which the colouring matters and markings are disposed furnishes an almost sure test, and I found in each egg the same indefinite zone and somewhat darkened smaller end. Assuming—and there certainly seems no reason to regard the assumption as insecure—that the two eggs were the produce of the same individual, the instance would seem to lend credence to the likelihood expressed in Prof. Newton's 'Dictionary of Birds' (article "Cuckoo," pt. I., pp. 122–124) of individual female Cuckoos only introducing their eggs into the nests of *one particular species*, and not indiscriminately into those of any of the birds usually selected as foster-parents. In the two cases in point, it is certain that the nests chosen for the introduction of the alien eggs were not selected as being the only available or most convenient. Indeed, the insertion of the egg in the former could not have been unattended with considerable difficulty, for it must have been deposited with either the bird's bill or feet without alighting; and the vicinity is one abounding in hedgerows and banks which afford suitable nesting-places for Hedgesparrows and Robins and other dupes of the Cuckoo.—W. C. J. RUSKIN BUTTERFIELD (Stanhope Place, St. Leonards-on-Sea).

Cuckoo's Eggs in Whitethroat's Nest.—On May 28th I found a Greater Whitethroat's nest containing two eggs and one of a Cuckoo's. I took the Cuckoo's egg. Going again on the 31st, I found the Whitethroat had laid one more egg, and had then commenced to sit. This is rather unusual, as the normal number of eggs is generally five. The nest was situated in a hedge at the top of a high bank, bordering a road which was little frequented. I mentioned the fact to Prof. Howes, and he suggested that it might be of some interest to your readers, as a Cuckoo laying in a Greater Whitethroat's nest is of somewhat rare occurrence.—W. LEONARD S. LOAT (Southborough, Tunbridge Wells).

Early Laying of Cuckoos.—Cuckoos seem to me to have laid unusually early this season, and the following dates may therefore be

worth recording. I have, as a rule, commenced to search for the eggs of this species about May 20th, continuing up to about June 10th, and most of the eggs I possess—about eighteen or twenty in all—were taken during the first week in June. To my surprise, however, this year I received a letter from a reliable correspondent residing in Surrey, dated May 14th, saying that he had already taken seventeen Cuckoos' eggs in the neighbourhood of Byfleet, the first having been found on April 30th. On May 25th I found in the ivy over a potting-shed in my garden here a Robin's nest containing a young Cuckoo about a week old, so that the egg from which it was hatched must have been laid quite at the beginning of May; and I also heard of another young bird in this neighbourhood rather older, so that the egg in that instance must have been laid earlier still. The young bird in my garden was discovered by my noticing four young Robins—only just hatched; in fact, one was still in the broken shell—lying on the ground below the nest, and on looking into the nest to ascertain the cause, I found a young Cuckoo in possession: he must have turned his companions out, therefore, almost as soon as he was hatched. From the actions of the birds, I have no doubt that they are still laying as usual, and I am inclined to think that the early eggs were the result of the exceptionally warm weather we experienced this year at the beginning of May.—E. A. BUTLER, Lt.-Col. (Brettenham Park, Suffolk).

Curious fate of a Cuckoo.—I was recently shown the remains of a Cuckoo preserved in such a way as to show the manner in which it met with its death. It is a hen bird, and seems to have been pushing its way into a bush in search of a small bird's nest. It must have used some degree of force, and had thrust its head into the fork of a fairly stout branch, when a more slender twig which had "given" a little, springing back into place, "clenched" the head behind, so that the bird could not withdraw it. When found the bird was dead, and had been hanging for some days.—J. H. SALTER (University College, Aberystwyth).

Palæornis rosea breeding in Confinement.—Late in the summer of 1893 I purchased two pairs of the Burmese Blossom-headed Parrakeet, *Palæornis rosea*, in nestling plumage. They were newly imported, rough in feathering, and their wings had been clipped; consequently I obtained them at a very reasonable figure. In this early stage the young birds are much alike, but the hens are somewhat stouter in build, and their plumage is rather duller than that of the cocks; both sexes, however, unlike *P. cyanocephalus*, have the purplish brown patch on the wing-coverts. Towards spring both males came into colour, but both sexes of one pair which I kept in a heated aviary failed to reproduce the primaries which had been cut off, and died soon after their moult: I then discovered that the bone had been injured by the knife of the native, who had maimed them.

The other pair, which I had turned out into a cold aviary, developed perfectly; and in May the male began to make advances to the hen, which she at first resented; eventually she permitted him to feed her, and he finally succeeded in enticing her into a log-nest suspended in one corner of the aviary. From this time the female bird seldom left the log-nest; the male bird entered from time to time to feed her, and I hoped she had laid eggs and was sitting; but in this I was mistaken, for it was late in June when, weary of waiting for results, I looked into the nest, and discovered two freshly-laid eggs. Early in July, watching my opportunity when the hen was taking a constitutional, I again looked into the nest and discovered a plump naked youngster, which uttered harsh hissing sounds until I covered it up. It left the nest, fully feathered, but with a short tail, on June 26th, able to fly short distances, but extremely nervous about trusting to its wings; the efforts of the parents to induce it to fly were very interesting. By September this young bird was larger than either parent, and called as loudly (the note is not unlike that sometimes produced by a heavy iron gate when very rusty and slowly opened widely); I therefore concluded that I had reared a male; but, as it still retains the greenish grey head of its mother, it seems likely that I was mistaken in this surmise. It is much wilder than its parents, which one would hardly have expected in a bird bred in confinement; but I have noticed in the case of some of our British birds that when reared from the nest by hand they become not only more wild than those caught in traps or nets, but remain permanently so.—A. G. BUTLER (Beckenham).

Jack Snipe in Dorsetshire in May.—On the evening of May 25th I flushed a Jack Snipe close to my feet, in a swamp on Bloxworth Heath. It pitched down again about twenty yards off, but I could not get it to rise a second time. This is the latest occurrence I have ever recorded. In my note-book on 'Birds' I see that on May 6th, 1851, I flushed a pair of these birds in a bog about a quarter of a mile distant from the spot where the one now recorded was found. I had no time on the last occasion to make any effectual search for a nest; in fact the spot where it rose was evidently only one where the bird was just then feeding; but it can hardly be supposed that these birds should be here in May and not breed with us. Some lucky accident will, I suspect, one day prove this to be the case.—O. P. CAMBRIDGE (Bloxworth Rectory).

Song of the Cirl Bunting.—Have any of the readers of 'The Zoologist' noticed that the Cirl Bunting has, in addition to its well-known ditty, which resembles that of the Yellowhammer without the long concluding note, a short and pleasant song sounding like "say, say, see," or "sayo, sayo, see"; the last note a third higher than the preceding? On one occasion, some years ago, I heard a bird which I believed to be a

bunting, on the wild grounds near Portsmouth. Its song, frequently repeated, sounded like "Tic, tic, tic, wirra, wirra." I could not get very near it, and have never since heard a song like it. It was not a Corn Bunting.—CHARLES W. BENSON (Rathmines School, Dublin).

Nesting Materials used by the Hawfinch.—Whilst examining the materials used in a nest I found situated in the topmost branches of an old crab-tree in Sutton Coldfield Park, I was particularly interested in finding, in addition to the usual dead twigs, fibrous root, and hair, that the nest had been built with a platform of the green leaves of the mountain ash, which could not have been obtained within some 250 yards of the spot. I cannot help thinking that these were used as a protection in screening the nest from observation from below.—J. STEELE ELLIOTT (Dixon's Green, Dudley).

Wood Pigeon nesting on the Ground.—Whilst exploring one of the many little islands on Lough Cong, Co. Galway, I came across a most unusual sight. The island to which I refer is thickly wooded with small firs, oaks, willows, and other trees and shrubs. Round the edges of the wood there was a line of high heather. Wood Pigeons, *Columba palumbus*, were breeding in considerable numbers in the wood; but as I was going round the edge of the island I almost stamped on a Wood Pigeon which rose from out of some high heather. Thinking that this was a curious place for the bird to be feeding, I looked down amongst the heather. In the midst of a thick clump of tall heather was a Pigeon's nest, composed of a few sticks placed literally on the ground. This nest contained one egg, which I have. This seemed very strange, but I thought it must be an accident. On the other side of the island, however, I flushed another Pigeon in the same way, and found another nest in exactly the same sort of position, but this nest contained quite a big young one. There seems no accounting for this curious fact. The birds must have nested in this position by deliberate intent. Yet there were plenty of good trees for their purpose, where other Pigeons were breeding.—HENRY F. WITHERBY (Blackheath).

Nightingale singing in July.—For the first time in my continental experiences, extending over twelve years, I heard the Nightingale sing in July last year, at Royat. We arrived there on June 29th, and at half-past ten p.m. heard its song very plainly from our hotel. The birds were plentiful in the neighbourhood, and continued to sing up to July 15th, when I heard one for the last time, as it sang close to the English church. Royat is an excellent station for ornithologists.—CHARLES W. BENSON (Rathmines School, Dublin).

[When the young are hatched the males leave off singing, and busy themselves in bringing food to the nest. This is generally before the end of the first week in June.—ED.]

Supposed hybrid between Blackbird and Thrush.—During the severe frost last winter a bird was caught in my garden which I at first took by gaslight to be an old hen Blackbird; but a more careful examination by daylight convinced me that there was something odd about it. It had the peculiar flattened crown which, together with a slight frontal depression, gives a frog-like aspect to the Song Thrush and Redwing when viewed from the front; the throat also had an ashy-white appearance suggestive of the Ring Ouzel. The bird, however, probably through inability to wash for several weeks, was so grimy that it was not easy to come to any definite conclusion as to its true colouring. On March 7th I showed the bird to my friend Mr. Frohawk, who agreed with me that there was something very odd about its appearance; we therefore decided to give it a good wash, and thereby ascertain its true colouring: this we did, and when thoroughly dry again we found it in all respects intermediate between Blackbird and Song Thrush. The following is a description, so far as it could be taken from a caged bird:—Upper parts, including wings, tail, cheeks, ear-coverts, and neck, deep smoky-brown; a narrow pale brown superciliary streak from the base of the upper mandible to behind the orbit, and a short moustachial streak from the lower mandible; circle round eye yellow; chin and throat ashy-white, forming a large triangle with its apex on the chin; sides of this triangle washed with brownish buff, and the whole surface traversed longitudinally by parallel irregular mottled dull black streaks, which pass into indistinct spots on the fore-chest; chest and breast rufous-brown, more smoky at the sides; abdomen and vent slightly greyish in the centre, shading into smoky brown at the sides and gradually passing into the more rufous tint of the breast. Bill orange, somewhat paler towards the tip; culmen blackish; feet yellowish horn-brown; iris hazel. Size about that of a Blackbird. I have once or twice found eggs of the Song Thrush deposited in the nest of the Blackbird; but at the time I thought this might have been done designedly by some naturalist trying an experiment (for I have tried such an experiment myself); but Mr. Frohawk on one occasion discovered a nest of this character which was undoubtedly visited by both Blackbird and Thrush. The existence of hybrid Blackbird and Song Thrush is tolerably well established; but I believe most of the birds supposed to represent this cross have been shot, not caught. It will be interesting to discover whether the song of such a bird will partake of the character of that of both parents. The alarm-note is a sharp “chuck,” very like that of the Blackbird.—ARTHUR G. BUTLER (Beckenham).

Crossbills in Leicestershire.—On March 15th Mr. Turner, of Market Harborough, received three specimens of the Common Crossbill, *Loxia curvirostra*, a male and two females, which had been killed near that town. The Crossbill occasionally remains in this country during the winter. In

the first week in January, 1852, while I lived in Oxfordshire, I shot two, a male and female, from a small flock which visited our garden. The plumage of the male differed very much from the bright tints of its summer dress; it was of an almost uniform pale red, with darker markings on the side of the head and on the wings; the plumage of the female did not show any marked change. — A. MATTHEWS (Gumley, Leicestershire).

Albino and Pied Varieties.—In February last I had a lovely white Wood Pigeon brought to me, I think the prettiest I have ever seen. There are a few dark feathers in its plumage, but they are hardly visible, and so far as they are noticeable they only serve to accentuate the general appearance of the bird, which is set off to great advantage by its purplish-red feet. It is a welcome addition to our local museum. In the spring of 1894 an albino of the common Whitethroat was brought in, a nestling and a dainty little bird, with pink irides. Mr. Whitaker's note on the pied Hawfinch (p. 72) reminds me that the Italian collection of birds at Florence contains a white Hawfinch. If I remember right, it is of a uniform dull white, with a pale grey chin-spot. Several pied Hawfinches are mentioned in the 'Avifauna Italica' of Professor Giglioli, who has procured many pretty varieties of birds for the Italian collection. The most noteworthy variety that I have seen of late is an example of the common Crossbill, *Loxia curvirostra*, preserved in the public museum at Bergamo. This bird has the head, neck, and breast of a pure yellowish white; the remainder of the plumage is brown and green. I never before heard of a pied Crossbill.—H. A. MACPHERSON (11, Victoria Place, Carlisle).

Ornithological Notes from Yorkshire.—On Feb. 1st several Whooper Swans were observed in this locality. On Feb. 2nd, when driving between Fewston and Darley, I observed three large birds on the moors near to a plantation. Getting within a short distance of them, they proved to be Black Grouse, a male and two females. I was shown, on Feb. 11th, a dead female specimen of the Lesser Spotted Woodpecker which had been found in Dob Park wood. This species is rare in the Washburn Valley. I have only known one instance of its nesting here—*viz.* in Lindley Wood in 1888. On Feb. 25th an old male Great Spotted Woodpecker was caught in Folly Hall wood. It breeds sparingly in this valley. Mr. J. Yorke, of Bewerley Hall, Pateley Bridge, informed me that, on Feb. 14th, he saw a Waxwing, *Ampelis garrulus*, in a thorn bush on the bank of the Nidd, about a mile above Pateley. It seemed to be in good plumage, and was eating berries greedily; it took no notice of him, though he watched it from a distance of only a few feet. I have never seen or heard of one here in recent years, though we have two in our collection which were killed here many years ago.—WM. STOREY (Fewston Lodge, near Otley).

Winter Notes from the Isle of Man.—On Feb. 23rd last I saw in the hands of Mr. G. Adams, of Douglas, a Red-necked Grebe (*Podiceps griseigena*), which a few days before had been killed at the south of the island, and sent to him for preservation. It had the chestnut colour on the neck well developed, and the cheeks whitish grey. I observed no trace at all of the slight crest of the species. In the Isle of Man, as elsewhere, birds suffered severely at the time of the great snowfall (Feb. 6th), and during the prolonged hard weather before and afterwards. On the day following this fall, flocks of birds of various kinds—Rooks, Starlings, and Chaffinches—sat, as if in a stupefied state, on the trees bordering the main road at Laxey, motionless, and regardless of passers-by and the stir of the village. There has been a perceptible thinning of Blackbirds and other song-birds, but Magpies and Jackdaws, which are very numerous and familiar about this place and its immediate neighbourhood, do not seem to be materially reduced in numbers. On Feb. 18th a male Red-breasted Merganser (*Mergus serrator*), in full plumage, and an adult Sheldrake (*Tadorna cornuta*) were found dead on the shores of Douglas Bay. The former was discovered “sitting upon a stone with the head folded upon the back.” A Heron was caught alive by some boys, who ran it down with a dog, and another, which was brought to Mr. Adams dead, was said to have fallen lifeless from the air while flying. Flocks of Gulls, chiefly of the Black-headed species, *Larus ridibundus*, though a good many Herring Gulls were also present, spent weeks among the houses of Douglas, being fed by the residents in the roadways and gardens. On Dec. 23rd, and on several subsequent dates, I saw, in Douglas Bay, a Black-headed Gull with a complete dark hood.—P. RALFE (Laxey, Isle of Man).

Common and Lesser Terns in the Outer Hebrides.—Mr. Howard Saunders, in his ‘Manual of British Birds,’ p. 631, states that he has no conclusive evidence of the occurrence of *Sterna fluviatilis* in the Outer Hebrides. When staying at Stornoway with a friend last August we were both somewhat anxious to obtain a specimen of the Arctic Tern (*S. macrura*), and accordingly rowed out one day to some low islands to the east of the harbour, where Terns were swarming; but the proportion of the Common to the Arctic species was roughly 15 to 1. I was fortunate enough to obtain a specimen of the latter, and my friend shot one of the Common species in mistake for an Arctic Tern; so we had ample opportunity for identification. Not being aware of its hitherto unrecorded existence in these parts, we unfortunately did not preserve the bird. Later in the month, when at Barra, there was a small rock in Vatersay Sound which was almost always covered with old and young Common Terns. The reason for this bird having been overlooked in the Outer Hebrides may no doubt be accounted for by the fact (as stated by Mr. Howard Saunders) that when the Common and Arctic Terns inhabit the same area they frequently

shift their quarters from year to year. On Aug. 3rd we both observed an adult Lesser Tern (*S. minuta*) rise from a cockle-bed in Broad Bay, Stornoway.—JOHN H. TEESDALE (St. Margaret's, West Dulwich).

The Sanderling in Australia.—In the middle of July, 1894, when out for a stroll along the beach, I had a family shot among a party of waders a mile or two south of Point Cloates (which is situated at the base of the North-West Cape peninsula). I picked up eight Turnstones, *Streptilas interpres*, two Little Sandpipers, and two other waders, which lacking the hind toe at once caught my attention. None of my books here containing any reference to the Sanderling, *Calidris arenaria*, I made a skin of one of my specimens, and forwarded it to Mr. A. J. Campbell, of Melbourne, who in turn sent it to Colonel Legge. He replies:—" *Calidris arenaria* in abraded plumage, with new winter feathers coming on back and wings." From Mr. Campbell's note in the 'Transactions of the Royal Society of Victoria,' it seems that only one other occurrence of the species has been noted here, namely, in New South Wales. Probably the bird visits these shores more often than is suspected.—THOMAS CARTER (Point Cloates, viâ Carnarvon, West Australia).

[This occurrence is noteworthy, for Mr. Seebohm, in his fine quarto work on the Geographical Distribution of the *Charadriidæ* and *Scolopacidæ*, makes no mention of the occurrence of the Sanderling in Australia. But so long ago as April, 1844, two examples of this bird were obtained by John Macgillivray in Sandy Cove, N. S. Wales, and are preserved in the Derby Museum, Liverpool (*cf.* Newton in 'Records of Australian Museum,' vol. ii. p. 22; and 'Nature,' 23rd June and 7th July, 1892.—ED.)

SCIENTIFIC SOCIETIES.

LINNEAN SOCIETY OF LONDON.

May 2nd, 1895.—Mr. C. B. CLARKE, F.R.S., President, in the chair.

Prof. J. W. Carr and Mr. W. Will were admitted Fellows, and Drs. C. Nordstedt, of Lund, Rudolph Philippi, of Santiago, and M. Woronin, of St. Petersburg, were elected Foreign Members.

Mr. H. M. Bernard showed under the microscope the circumscribed patches of setæ above and below the stigmata on the pupa of the Vapourer Moth, *Orgyia antiqua*. The arrangement suggested a vanished notopodium just where in the Hexapods a dorsal branch of a parapodium ought to have vanished, according to the exhibitor's method of deducing the different groups of the Arthropoda from their Annelidan ancestors, as sketched in his recent paper on the *Galeodidæ*.

Mr. E. M. Holmes exhibited some new British Algæ from Dorsetshire and Sussex; amongst others *Ulvella confluens* and *Ectocarpus Reinboldi*,

both discovered last month at Weymouth, and the latter previously known only from the Baltic.

Mr. J. E. Harting exhibited and made remarks on a specimen of *Cuculus canorus* in the rare hepatic plumage (*Cuculus hepaticus*, Sparmann), recently obtained at Bishop's Waltham, Essex.

Mr. W. T. Thiselton Dyer, C.M.G., then gave an abstract of a paper by the late Mr. John Ball, F.R.S., "On the distribution of Plants on the southern side of the Alps," prefaced by some account of the author's life and special work in relation to the alpine Flora.

May 24th: Anniversary Meeting. — Mr. C. B. CLARKE, F.R.S., President, in the chair.

The Rev. A. Thornley and Mr. Rudolf Beer 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. The following were elected:—Prof. J. B. Farmer, Mr. A. Gepp, Prof. Howes, Dr. St. G. Mivart, and Mr. A. S. Woodward.

On a ballot taking place for the election of President and Officers, Mr. Charles Baron Clarke was re-elected President; Mr. Frank Crisp, Treasurer; Mr. B. D. Jackson, Botanical Secretary; and Prof. G. B. Howes, Zoological Secretary.

The Librarian's Report having been read, and certain formal business disposed of, the President delivered his Annual Address, prefaced by some remarks on the present position of the Society. On the motion of Sir Joseph Hooker, seconded by Dr. John Anderson, a vote of thanks was accorded to the President, with a request that he would allow his Address to be printed.

The Society's Gold Medal was then formally awarded to Prof. Ferdinand Cohn, of Breslau, and was received on his behalf by Mr. B. D. Jackson for transmission through the German Embassy.

The President having called attention to the retirement of the Zoological Secretary, Mr. W. Percy Sladen, after holding office for ten years, an announcement which he felt sure would be received with universal regret, it was proposed by Mr. Carruthers, seconded by Mr. Crisp, and supported by Mr. Charles Breeze, "That the Fellows of this Society, regretting the retirement of Mr. Walter Percy Sladen from the post of Zoological Secretary, which he has occupied for the past ten years, desire to record upon the Minutes of the Society's Proceedings an expression of their high appreciation of the services which he has rendered to the Society, and of the very able manner in which he has at all times discharged the duties of his office."

This resolution, having been put, was carried unanimously, and after a sympathetic reply from Mr. Sladen, the meeting adjourned to June 6th.

In the evening a number of Fellows of the Society dined together at the Grand Hotel, Charing Cross, the President occupying the chair, and being supported by several distinguished visitors.

ZOOLOGICAL SOCIETY OF LONDON.

May 7th, 1895.—Sir W. H. FLOWER, K.C.B., F.R.S., President, in the chair.

The Secretary read a report on the additions to the Society's Menagerie during the month of April, and called attention to two specimens of the Irish Stoat, presented by Viscount Powerscourt; also to two Polar Hares from Norway, presented by Mr. O. Gude; and to specimens of the peculiar Parrakeet of Antipodes Island, *Cyanorhamphus unicolor*, presented by the Countess of Glasgow, Sir Walter E. Buller, and Mr. W. E. Collins.

A letter was read from Dr. F. A. Jentink concerning a Monkey lately described as *Cercocebus aterrimus*, of which the type had been acquired by the Leyden Museum. Dr. Jentink considered this Monkey to be the same as *Cercocebus albigena*, Gray.

Mr. J. H. Gurney exhibited and made remarks on a rare Kingfisher, *Alcedo beavani*, obtained in Ceylon by Mr. A. L. Butler.

Mr. G. F. Scott Elliot made some remarks on the fauna of Mount Ruwenzori, in British Central Africa. He stated that Elephants occur in great numbers on the east side of the mountain. There were also many still living, and vast stores of ivory, in the Congo Free-State, just beyond the south-west corner of the English sphere of influence. He pointed out the presence of the Hippopotamus in the Albert-Edward Nyanza, and its abundance in the Kagera River. It was found frequently in the country of Karagwe, usually near the marshy lakes leading to the Kagera. On the alluvial plains about the east of Ruwenzori Jackson's Hartebeest, *Bubalis jacksoni*, the Kob, *Cobus kob*, and another Waterbuck (perhaps of a new species) were common. No Buffaloes were seen. A Bushbuck also occurred on Ruwenzori, from 7000 to 8000 feet. Of Monkeys he had noticed the presence of a black and white *Colobus*, which he could not identify, and of at least two other species, probably a *Cercopithecus* and a Baboon. Some small Mice brought home had not yet been identified. Leopards were numerous, and Lions were also common on the lower grounds. Two species of Sunbird were brought back, one of which ascends to 11,000 feet on Ruwenzori. Mr. Scott Elliot concluded by remarking that the general idea of distribution gathered from the flora seemed to confirm such data as he could gather from the fauna of the country which he traversed during his journey.

Messrs. F. E. Beddard and P. Chalmers Mitchell made a communication on the structure of the heart in the Alligator, as observed in specimens that had died in the Society's Menagerie.

Mr. Chalmers Mitchell described the anatomy of the Crested Screamer, *Chauna chavaria*, pointing out some resemblances between the alimentary canal of that bird and the Ostrich, and giving a detailed comparison of the structures of *Chauna chavaria* and *Palamedea cornuta*.

A communication was read from Dr. Percy Rendall containing field-notes on the Antelopes of the Transvaal.

Dr. St. George Mivart read a paper on the skeleton of *Lorius flavo-palliatu*s as compared with that of *Psittacus erithacus*.

May 21st.—Lt.-Col. GODWIN-AUSTEN, F.R.S., V.-P., in the chair.

Mr. Sclater made some remarks on the Zoological Institutions he had recently visited in Egypt, namely, the new Zoological Garden at Gizeh, the Zoological Museum in the Government Medical School at Cairo, and the Ostrich-farm at Matarieh.

Mr. Howard Saunders exhibited and made some remarks on a Duck, believed to be a hybrid between the Wigeon and some other species undetermined, which was shot on the Moy Estuary, Co. Mayo, last winter.

Dr. R. Bowdler Sharpe gave an account of the ornithological collection made by Dr. Donaldson Smith, during his recent expedition into Somaliland and Gallaland, containing about 500 specimens, referable to 182 species, of which twelve were new to science.

Mr. G. A. Boulenger read a synopsis of the genera and species of Apodal Batrachians, and gave a description of a new genus and species proposed to be called *Bdellophis vittatus*.

Lt.-Col. H. H. Godwin-Austen read a list of the Land-Molluscs of the Andaman and Nicobar groups of islands in the Bay of Bengal, and gave descriptions of some new species, together with a complete account of the distribution of all the species in the various islands of these two groups.

A communication was read from Dr. J. Anderson, containing the description of a new species of Hedgehog from Somaliland, which he proposed to name *Erinaceus sclateri*.

A communication from Mr. R. Lydekker contained notes on the structure and habits of the Sea-Otter, *Latax lutris*.

A communication was read from Dr. B. C. A. Windle containing remarks on some double malformations observed amongst fishes.

Mr. F. E. Beddard read a paper on the visceral and muscular anatomy of *Cryptoprocta*, dealing chiefly with the brain, alimentary canal, and muscles of this Carnivore.—P. L. SCLATER, *Secretary*.

ENTOMOLOGICAL SOCIETY OF LONDON.

May 1st.—Prof. RAPHAEL MELDOLA, F.R.S., President, in the chair.

Mr. Oswald H. Latter was elected a Fellow; and Dr. C. G. Thomson, of the University, Lund, Sweden, was elected an Honorary Fellow, to fill the vacancy caused by the death of Pastor Wallengren.

Mr. H. St. J. Donisthorpe exhibited a variety of *Rhagium bifasciatum*, a longicorn beetle, taken in the New Forest, in which the elytra were of a light testaceous colour.

Mr. Waterhouse exhibited a living larva of a longicorn beetle found in a boot-tree which had been in constant use by the owner for fourteen years, the last seven of which were spent in India. The specimen was brought to the British Museum on May 6th, 1890, and was put into a block of beech wood, in which it had lived ever since; it did not appear to have altered in any way during these five years. It had burrowed about eight inches, and probably made its exit accidentally. Mr. Blandford referred to a similar case which had come under his notice.

Mr. C. G. Barrett exhibited a long series of the dark and strongly-marked varieties of *Agrotis cursoria* and *A. tritici*, taken on the sandhills of the north-east coast of Scotland by Mr. Arthur Horne, of Aberdeen.

Mr. Dale exhibited a specimen of a *Sesia*, supposed to be a new species, from the New Forest.

Mr. O. E. Janson exhibited a remarkable species of *Curculionidæ* from the island of Gilolo, having exceedingly long and slender rostrum, antennæ, and legs; it was apparently an undescribed species of the genus *Talanthia*, Pascoe.

Mr. Nelson Richardson called attention to a paper by himself, in the 'Proceedings of the Dorset Natural History and Antiquarian Field Club,' on the subject of Dorset Lepidoptera in 1892 and 1893.

Mr. W. L. Distant communicated a paper "On a probable explanation of an unverified observation relative to the family *Fulgoridæ*." In this paper the author cited the expressed opinions of certain naturalists as to the luminous properties of some species of this family. In the discussion which ensued Mr. Blandford said he thought further evidence was required on the subject of the alleged luminosity in the *Fulgoridæ* before the statements contained in Mr. Distant's paper could be accepted.

Mr. J. J. Walker, R.N., contributed "A Preliminary List of the Butterflies of Hong-Kong, based on observations and captures made during the winter and spring of 1892—1893." Prof. Meldola commented on the interesting character of the paper from an entomological point of view, and the value of the observations therein on the geology, botany, and climate of Hong-Kong.—H. Goss, *Hon. Secretary*.

THE ZOOLOGIST

No. 223.—July, 1895.

PEMBROKESHIRE BIRDS IN 1603.

BY REV. MURRAY A. MATHEW, M.A., F.L.S.

SINCE the publication of my 'Birds of Pembrokeshire and its Islands,'* Mr. Henry Owen, B.C.L., F.S.A., has very kindly forwarded to me Part I. of 'The Description of Penbrokeshire,' † by George Owen, of Henllys, Lord of Kemes, that he is editing for the "Cymmrodorion Record Series." This very quaint and interesting description of the county was published in 1603, and contains a short chapter entitled "Of abundance of foule that the Country yeeldeth, and of the severall sortes thereof," ca. 16, p. 128. I was a little surprised to read that, in Queen Elizabeth's day, the Spoonbill, *Platalea leucorodia*, could be included among the birds nesting in trees in this county, and consider that its having anciently possessed breeding stations here accounts for the persistency with which the birds at the present day pay visits to their ancestral haunts; flocks (as related in my book) occasionally still put in an appearance on the mud-flats adjacent to Milford Haven, and are also not rare in the neighbouring county of Cardigan on the river Dovey. The history given by the Lord of Kemes of the abundance of the Woodcock in his day is peculiarly amusing; and his whole account of the *ornis* of the county seems to be worthy to be subjoined *in extenso*. The editorial footnotes are also valuable, and are given, although the identifi-

* Reviewed in 'The Zoologist,' 1894, p. 437.

† This is the old spelling of the name of the county, and is said to come from two Welsh words, *Pen* "head" and *broch* "foam," descriptive of the storm-vexed headlands of its coasts.

cations of some of the old names of the birds are open to question. It is doubtful if the name *Whyniarde* applies solely to the Shoveller Duck, on which species, according to Swainson (Prov. Names, p. 158), it is bestowed in Waterford. *Winnard*, in Cornwall, is the local name of the Redwing. *Pilwater* may be connected with the west-country *pill*, the name given to a small tidal creek; and may be equivalent to *pillcock*, the Devonshire name of the Redshank. See 'The Zoologist' for March last (p. 106). In Welsh *pil* means equally a creek and something that hovers, and from its latter meaning its connection is probably traced with the Shearwater. It is also doubtful if *flushe* = "fledged," but rather "full grown" or "in vigour," which it is stated is its Shakesperian sense.

"OF ABONDANCE OF FOULE THAT THE COUNTRY YEELDETH,
AND OF THE SEVERALL SORTES THEREOF." Ca: 16.

Haveinge spoken somewhat of the fishe taken in the COUNTRYE as one chiefe Comodytie of the same, yt standeth in Course next to speake of the fowle, w^{ch} yearely breedeth in, and haunteth the land and sea shore w^{ch} are not so diuerse in kinde, as abundant in multitude, and plentie, w^{ch} is allmost incredible to be reported; and what plentie, and chepenes ys to be had at some times and seasons, whereof some are found allwaies in season, as the grouse, heathcocke, and woodquyst,* the Crane,† the heronshew, the gull kept, and fedd, the Curlew &c, some other are but at seasons, as the woodcocke, the wild goose, wild ducke, bittur, wilde swanne &c.

GULLES. But of all fowle, wee of Penbrokeshire claime interest in two sortes chiefly, that is the gull, and the woodcocke, for the great plentie wee assure our selves of yearely, the first being our owne naturall, and natyve COUNTRYE fowle breede amonge vs, and for his good stomacke much of disposicion, wth the baser sort of labouringe people of some part of our COUNTRYE that are (truelie) slaundred‡ with eating fyve meales a daye, and in such aboundance, and plentie, that in their season, the townes

* The Wood Pigeon.

† The Crane has left us; the heron, or heronshaw (properly young heron), is still locally called the "long crane."

‡ Slandered,

& countrey about are verye plentifulle served therewth; the chiefe nurserie of this fowle is in small Ilandes, in the sea, and neere the lande whereof I have made mention before in the 14 chapter, where I entreate of salte Ilands, where in Maye and June they are found to breede in suche plentie, that you can hardlie walke on the lande of some small Ilands wthout treading on the Egges in the nestes vpon the ground. These fowles breede also in the sea cliffes in great store, and are ripe about mydsomer, at w^{ch} time they become flushe,* and are taken being readye to forsake their nestes, and such as are flushe are followed wth boates, and taken swymminge, not being able to flee, and a broght a land, and are verye dayntie meate :† presentlie as soone as they are taken, and wilbe fedd, and kept as a readye dishe all the yeare, over and beside the provision, w^{ch} the gentlemen and others of the sheere doe make to serve their houses, there is great store sould into England, and sought and sent for out of the inland shires, a hundred miles and more.

WOODCOCK. The woodcocke, although he be not our countrye-man borne, yet wee must needes thinke him to be of some affinitie to manie of our countrie people, by reason of the love and kindenes he sheweth in resortinge hither, first of all before other partes of Wales, or England, and in more aboundance then ellswere, and stayeing longer wth vs than in anie other place, and if I maie in sport suppose a cause thereof, let yt be, for that the people in generall of this countrey are found to be of more playne meaninge, simple, harmlesse, and farthest from Machiavill devises, or bearinge highe and pryeing spyryttes; this fowle being noted likewise for his symplicitie (of some called foolerye) yt maye be guessed, he maketh choice rather to converse amonge these people being neerest to his innocent, playne and symple humour, according to the old Adage, *Similis similem sibi quærit*, but whatsoever the cause ys, wee are most beholding to him of all other fowle, and first for his tymelie visitinge vs; Yf anie Easterly winde be alofte, wee shalbe sure to have him a fortnight, & sometimes 3 weeke before Michaelmas, and for plentie yt is almost incredible, for when the chiefe time of haunte ys, wee haue more

* Fledged. To "flush" a bird is to make it take wing.

† Lewis, the great-grandfather of Fenton the historian of Pembrokshire, says that in his day they would as soon think of eating Cormorants.

plentie of that kinde of foule onely, then of all other sortes layed together, the chieftest plentyeys betweene Michaelmas and Christmas, and in these three monethes he visiteth most houses, their chiefe takinge is in cockeroades* in woodds, wth nettes erected vp betweene two trees, where in cocke shoote tyme (as yt is tearmed) w^{ch} is the twylight, a litle after the breakinge of the daye, and before the closinge of the night) they are taken, sometymes ij. iij. or iiij at a fall. I haue my selfe oftentimes taken vj at one fall, and in one roade, at an eveninge taken xvij, and yt ys no strange thinge to take a hundred or sixe score in one woodd in xxiiij^{or} houres if the haunt be good, and much more hath beene taken, thoughe not vsually. Yt is strange to thinke from whence theis fowles shold come in such soddayne sorte, as they are ffound to doe, for if there be not one seene, or to be founde in the Countrey, if at any time, the East Southeast or Northeast winde blowe could, and sharpe, this Countrey wilbe full wth in xij houres, and yet in the countries, w^{ch} lye East of this not one to be seene or found in a moneth after: then againe the nature of the fowle ys not to flee in the daie tyme, nor in the night, but reasteth all daye in the woodd, and all night abroad in the fieldes feedinge, and onely fleeth one flight every evening out of the woodd into the fields, and every morninge retourneth againe into the woodd, and so resteth all daye, and all night, so that yt ys to be marveiled, from whence they come, or where they breede; for if they shold come from out of the Easterne Countreys; yt were very likely they shold bee seene to flee by day or by night, w^{ch} as I saied before ys against their nature: also they shold be found in those Countries wch lye Easterly of this sheere, as ys the Counties of Carmarthen, Brecknock, Cardigan, Radnor and

* Fenton (p. 6), in his eulogium on his great-grandfather, John Lewis, says that he remembers three glades at Manarnawan used in his time for catching Woodcocks in winter. And see our author's account of the wood of Pen Celli (*cf.* pp. 86, 101, above), quoted from a Bronwydd MS. by Fenton, in 'Cambrian Register,' ii. 104:—"Also there is in said wood 13 *cock shots*, wherein is great store of Woodcocks taken yearly, which *cock shots* are the Lord's own," &c. Shakespeare, Rich. III. v. 3, speaks of "*cock-shut time*." *Cock shut* occurs commonly in the place-names of the parts of England that border on Wales, and is not uncommon in parts of Wales itself. In at least one case it has been Wallicized into *Cocsyth*. There is a place called *Cock road* between the Hardington and Buckland Woods, about three miles N. of the town of Frome.

Salop, in w^{ch} Countreyes yee shall hardlie finde any iij weekes or a moneth after this Countrie ys filled with them: ffurther they come not by one and one, or fewe, but at a suddaine all partes are filled wth them, so that some men of Judgement are of opynion, that they are to be nombred *inter animalia imperfecta*; and that they are engendred and raised by the meare Easterlye winde of some substance here in the Countrie; the like whereof you may reade of diuerse other fowles and other wormes in *Plynie*.*

The Plentie of this, and other kinde of fowle hath beene such in a hard wynter, as I haue hard a gentleman of good sort and credytte report that he hath bought in St. Dauids, ij woodcockes, iij snipes, and certayne teales and black byrdes for a peny, and suerly yt will not be beleued in other places, what penyworthes are hadd of fowle in this Countrye yearely.

Beside these two kindes of fowle, w^{ch} wee accompte among household fare, the countrye yeeldeth great store of other sortes as the mounteines foster, the grouse, heathcocke, which are allwaies in season, and the plover both grey and russett,† the sea clyffes harbour the wylde pygeons, the dove house the tame; in the bogges breedeth the crane, the byttur,‡ the wild ducke, and teale, and diuerse others of that kynde; on highe trees the heronshewes, the shovler,§ and the woodquistes; the heronshewes are allso found in many places of the sea clyffes but chiefly on highe and stately trees, to w^{ch} places they are quickly allured by placing of horsehead bones upon branches of trees, wch will provoke them to like of the place; where they breede they come in companies, so as you shall haue in some places xij or xvj nestes vpon a tree, they breede iij times in the yeare, if the yonge be taken awaie, otherwise but once, they hatche first about *Aprill* and *Maye*, and commonly bringe furth at the first sitting, 4. 3 the next, and lastlie. 2: yonge.

* For this curious theory of wind-eggs, *cf.* Varro, 'De Re Rust.' ii. 1. Virgil (Georg. iii. 275) attributes similar powers to the west wind.

† The Golden Plover.

‡ This is the old form of the word (from Fr. *butor*). See 'Faerie Queene,' viii. 50. The Bittern as a breeding species has been improved off the land by modern drainage, and is now only met with in winter.

§ The Shovelard, or Spoonbill (a wader). Sir Thomas Browne, writing in 1668 'On Norfolk Birds,' mentions it as common in his time, breeding "formerly at Claxton & Reedham; now at Trimley in Suffolk."

In the field breedeth the Partridge, quaille, raile, lapwinge and larke, and many other sorte of small byrdes, and in shrubbes, groves and hedges breedeth the pheasant thoughe scarcely in this Contrye. The Curlieue* contynueth allwayes in this Contrye, yet never fond to breede, and they flee in small herdes together. The Countrie yeeldeth also diuerse other fowle, as wild geese, Whyniarden, † the Puett, ‡ the Curlew knave, § the gwylim, || the Sheldrake, both sorts of dyvers or dippers, the pilwater, ¶ the Wigion, Cootes, w^{ch} also keep in Companies, sea pies and sea crowes,** being most water foules, beside the blacke bird, thrushe, the wynter socke, the stare, †† the house and headge sparrows, the fynche, the bunten, all w^{ch} shold haue beene seated †† wth small birdes before. And as I ended my last chapter of fishe wth three strandge natured fishes, so lett me shutte vp this of fowle wth the like; of w^{ch} I finde two, the one strange in accompt, the other in nature; first of w^{ch} is the Puffine, a bird in all respectes bredd of byrdes of his kinde by layeing egges, fethered & flieing wth other birdes in the ayre, and yet is reputed to be fishe, the reason I cannot learne. But if I were so ceremonious as to refrayne fleshe at seasons, I shold hardely adventure to eat this fowle for fishe, yt is a water fowle lesser then the ducke and lardger then the teale, footed and beaked like vnto them, and breedeth on the Iland of *St. Davids* §§ and other like places.

The second is the Barnacle a goodlie byrd in all respectes like the wilde ducke, but much lardger, having head and foote like to the ducke and ys in eatinge like yt allso. This fatherlesse byrd is bredd of noe parent, but engendred by secreat nature out of some peece of tymber remayninge long in the sea, and at shippes sides having remayned long in the salt water, out of w^{ch} vpon longe stringes or roapes shalbe seene x. xx. or xxx of these byrdes growinge out of two shells, like muskle shells, where you shall find some beginninge to appeere out of the shells, having the perfect forme of a fowle, some more ripe, readie to fall of,

* The Curlew (Fr. *courlieu*), in Welsh (*y*) *Gylfin-hir*, corrupted in the Vale of Dovey into *Glyfeinir*.

† Shoveller Duck.

‡ Black-headed Gull.

§ The Whimbrel.

|| The Guillemot.

¶ The Manx Shearwater.

** Oystercatchers and Cormorants (called in Welsh *morfran*, *mulfran*).

†† The Fieldfare and Starling.

‡‡ Set down.

§§ Ramsey Island.

having wings, legges, and buds of feathers, hanging onely by the bill, of these I haue seene manye, and as the people report and verielie are perswaded, these be the Barnacles, for other breedinge there is not found of them.*

THE MAMMALIAN FAUNA OF CHESHIRE.

By T. A. COWARD AND CHARLES OLDHAM.

(Concluded from p. 221.)

Order CETACEA.—Fam. BALÆNIDÆ.

Megaptera boöps, Fab.; Hump-backed Whale.—A young female, 31 feet in length, was stranded on a sandbank in the Mersey estuary, near Speke, on July 17th, 1863. It was examined in the flesh by T. J. Moore, whose account of its capture ('Naturalists' Scrap-book,' p. 103) was quoted in 'The Zoologist' for 1863, p. 8801. The skeleton is now in the Brown Museum, Liverpool. Dr. J. E. Gray's erroneous statement that this specimen was captured in the Dee estuary (Proc. Zool. Soc. 1864, p. 211) has been repeated in the second edition of Bell's 'British Quadrupeds,' and elsewhere.

Family PHYSETERIDÆ.

Hyperoödon rostratus (Chemnitz); Common Beaked Whale; Bottle-nosed Whale.—This species has occurred on the coast more frequently than any of the other large cetaceans; and, unless there has been some confusion and error with regard to dates and localities, there are no less than nine distinct records. An example, 24 feet in length and 12 feet in girth, was taken in October, 1785, "in the recess of the river Dee below Chester" (Pennant, quoted by C. Collingwood, "Historical Fauna of Lancashire and Cheshire," Proc. Liv. Lit. and Phil. Soc., vol. xviii. 1863-4, p. 163). One taken at the mouth of the Mersey at the end of April, 1829. The skeleton was preserved in the Museum of the Royal Institution, Liverpool ('Loudon's Magazine,' vol. ii. p. 391). One, 24 ft. in length and 13 ft. in girth, captured on the East Hoyle Bank at the end of September, 1839 (Wm. Thompson,

* The old fable that the Bernicle Goose was produced from old ships rotting in the ocean was refuted by Ray and Willughby in 1676 (Harris's 'Travels,' ed. 1764, ii. 669).

Ann. Nat. Hist., 1st series, vol. iv. 1840, p. 379, and vol. v. 1840, p. 361). Byerley records four occurrences: one on the East Hoyle Bank, 1850; one at Little Meols about the year 1851; a male, 21 ft. long, on the East Hoyle Bank, Aug. 25th, 1853. For three weeks after the capture of the last-named specimen another—supposed to be its mate—frequented the neighbourhood, but was not secured. One, 24 ft. long, was stranded at Speke in October, 1856. The skeleton is preserved in the Nottingham Museum (T. J. Moore, 'Report ii. Liverpool Marine Biology Committee,' p. 142). One captured near Speke on Sept. 2nd, 1881 (T. J. Moore, Proc. Liv. Lit. and Phil. Soc., vol. xxxvi. 1881-2, p. xlix).

Family DELPHINIDÆ.

Phocæna communis, F. Cuv.; Porpoise.—Byerley describes this species as "frequent in shoals during stormy and changeable weather;" and Mr. Newstead says, "Often occurs in the Mersey below Eastham." Moore states, in his list of Seals and Whales, that a form "named by Dr. Gray *P. tuberculifera*, on account of a series of short spiny processes on the front edge of the dorsal fin, would appear to be not uncommon, for two specimens at least had come under his observation in our district; namely, one speared a quarter of a mile off the Rock Lighthouse, Feb. 7th, 1867, measuring 4 ft. 8 $\frac{3}{4}$ in., and another, 4 ft. 4 in., taken near the Herculaneum Dock, Oct. 12th, 1881."

Orca gladiator (Lacép.); Grampus.—A male, stated to have been 25 ft. in length, was stranded at West Kirby on March 22nd, 1876. The purchaser of the carcass stated that in its death agony the creature threw up a quantity of sea-fowls' feathers (T. J. Moore, Proc. Liv. Lit. and Phil. Soc., vol. xxx. 1875-6, p. lxxxv).

Lagenorhynchus albirostris (Gray); White-beaked Dolphin.—A full-grown male of this species was stranded on the rocks at Little Hilbre on Dec. 29th, 1862, and was secured by Mr. Barnett, of Hilbre, for the Brown Museum, Liverpool. It lived eight hours after it was taken from the water (T. J. Moore, Ann. and Mag. of Nat. Hist., 3rd series, vol. ii. 1863, p. 236).

Delphinus delphis, L.; Common Dolphin.—This species has been observed twice on the Cheshire coast. One was found on the shore at New Brighton on Feb. 13th, 1879. The skeleton is in the Brown Museum, Liverpool (T. J. Moore, Proc. Liv. Lit.

and Phil. Soc., vol. xxxiii. 1878-9, p. lxxii). Another was stranded at West Kirby on Feb. 17th, 1893, and is preserved in the Brown Museum, Liverpool. We are informed by the Rev. G. H. Staite, of West Kirby (*in lit.*), that this example "was stranded with another much larger one, which had been so mutilated, evidently by some mischievous person, as to be useless. The weather had been stormy. The Dolphin was taken, as the tide was receding fast, off the south of West Kirby village. It was quite vigorous, and lived till next day."

OBSERVATIONS ON BIRDS IN MID-WALES.

BY J. H. SALTER.

(Concluded from p. 224.)

FULICARIÆ.

WATER RAIL, *Rallus aquaticus*. Doubtless a common resident, though only noticed during the shooting-season, when many are obtained.

SPOTTED CRAKE, *Porzana maruetta*. Probably breeds sparingly, as a few are always shot in September and October. Mr. F. W. Fielden has met with five examples. There are three in the possession of Capt. G. W. Cosens, and one at Gogerddan.

CORNCRAKE, *Crex pratensis*. Fairly numerous. An injured bird has been known to stay the winter. 1892, May 1st; 1893, April 21st; 1894, April 21st.

MOORHEN, *Gallinula chloropus*. Not numerous, as suitable ponds and streams are scarce.

COOT, *Fulica atra*. Scarcely known as a resident, as lakes with suitable covert are wanting. Occurs in winter on the Dovey, and in flocks on the sea.

GAVIÆ.

BLACK TERN, *Hydrochelidon nigra*. An example obtained by Mr. Hutchings in spring, one of two which frequented a sheltered inlet in front of the College.

COMMON TERN, *Sterna fluviatilis*. A passing migrant, seen chiefly in May. Its appearance at the lakes in the hills is regarded as a sign of bad weather. Breeds on the coast of Anglesey, but apparently not on the shores of Cardigan Bay.

ARCTIC TERN, *S. macrura*. Occurs with the last named.

LITTLE TERN, *S. minuta*. Breeds in small colonies of from two to twenty pairs at intervals along the Merionethshire coast. On June 13th, 1894, I found six nests in the course of a few minutes. One of the birds flew towards me, hovered, and alighted upon its nest within fifty yards. The eggs are hatched about July 3rd.

SABINE'S GULL, *Xema sabinii*. An example occurred after three days of very rough weather, Oct. 17th, 1891. It is now in the collection of Sir Vauncey Crewe at Calke Abbey.

IVORY GULL, *Pagophila eburnea*. Two occurrences at Aberystwyth within the last thirty years, both the birds having passed through the hands of Mr. Hutchings.

KITTIWAKE, *Rissa tridactyla*. Invariably appears inshore after rough weather. During exceptional storms many are beaten down into the sea and drowned. Has no breeding station on the Cardiganshire coast.

BLACK-HEADED GULL, *Larus ridibundus*. A common winter gull, and almost equally numerous in summer, when many remain on the Dovey, and are seen passing to and fro between the river and the hills. I also found plenty at Barmouth at the end of June, and on July 3rd saw two speckled young birds in the river, so that there is probably a nesting-place somewhere in the hills. A few pairs seem to have attempted to nest at Mochras Island, as they noisily mobbed some visitors. Amongst rushes I found what I supposed to be their nests, and picked up an undoubted egg.

LITTLE GULL, *L. minutus*. Capt. G. W. Cosens saw an example in mature plumage at Glandovey, and noticed the black under side of the primaries. Two have occurred to Mr. Hutchings, one of them during the storm of October, 1891, which brought the Sabine's Gull and Grey Phalaropes.

ICELAND GULL, *L. leucopterus*. Not at all infrequent, but, curiously enough, appears not to have occurred in Pembrokeshire. After a very severe gale some years since Iceland Gulls were plentiful off Aberystwyth. One, in immature plumage, obtained at Borth about Nov. 1st, 1894.

GLAUCOUS GULL, *L. glaucus*. Mr. Hutchings has preserved three or four, one of them a remarkably fine old bird. Once seen by Mr. F. T. Fielden at Borth.

GREAT BLACK-BACKED GULL, *L. marinus*. Chiefly seen about the llyns or pools on the hills in March and April. A few pairs may breed there. I have not found it nesting upon the Cardiganshire coast.

LESSER BLACK-BACKED GULL, *L. fuscus*. Not found nesting upon the coast, but breeds upon the Teifi Bog, about twelve miles from the sea. The colony, which was formerly larger, numbers about fifty pairs. The nests are placed on slight hillocks, generally in deep heather, the vicinity, with trampled grass and scattered feathers, being suggestive of a goose-green. The bog being preserved for Hares and Grouse, the Gulls are subject to ceaseless persecution. Their castings contain bones and fur, but they also fish the pools and streams. A new-born puppy, which I found dead near the nests, had probably been brought as an addition to the commissariat. On June 8th, 1892, I found about sixty eggs, one nest containing four. Owing to the eggs having been collected, only eight or ten young birds were seen at that date.

HERRING GULL, *L. argentatus*. The only gull which breeds upon the Cardiganshire coast. Its colonies commence about six miles south of Aberystwyth, and occur at intervals as far as Cardigan Island, the largest settlement extending for about two miles between Cwm Tydi and Ynys Lochtyn. On May 12th, 1894, the nests upon the cliff between Aberaeron and New Quay all contained the complement of three eggs, but these were probably taken, as I found most of the birds sitting upon two eggs on June 26th. Upon this date a few young ones were to be seen upon the ledges, but none had yet gone down to the sea.

COMMON GULL, *L. canus*. Abundant in winter, feeding much inland. On May 2nd, 1894, I saw a flock of about one hundred and fifty, evidently collected previous to departure.

GREAT SKUA, *Stercorarius catarrhactes*. Of less common occurrence than the two succeeding species. Mr. Hutchings only recollects a single instance.

POMATORHINE SKUA, *S. pomatorhinus*. Most of the "Fork-tailed Skuas" reported from time to time are probably of this species. Capt. G. W. Cosens has an example in immature plumage.

RICHARDSON'S SKUA, *S. crepidatus*. Occurs from time to time. An adult of the light race and an immature bird are pre-

served at Gogerddan. At Borth, Mr. F. T. Fielden watched one feeding on offal. It allowed him to approach within a dozen yards, and remained for about ten days.

PYGOPODES.

RAZORBILL, *Alca torda*. Constantly to be seen fishing in the bay, generally in company with the knots of Gulls which hover and scream over a surface-swimming shoal. Many dead ones are washed up in winter after continued rough weather. A few pairs breed in company with Guillemots at New Quay Head.

COMMON GUILLEMOT, *Uria troile*. There is a small colony upon the Craig yr Adar, or "Birds' Rock," a part of New Quay Head. This is the only breeding station upon the Cardiganshire coast. On June 26th, 1894, a few young ones were to be seen, but most of the birds were still sitting.

BLACK GUILLEMOT, *U. grylle*. Mr. Hutchings only knows of one example, a bird in summer plumage, shot in April some miles out in the bay.

LITTLE AUK, *Mergulus alle*. One or two obtained almost every winter, generally washed ashore dead after rough weather.

PUFFIN, *Fratercula arctica*. Seldom seen inshore, unless washed up, though no doubt common in the Channel. It has no breeding station upon the Cardiganshire coast.

GREAT NORTHERN DIVER, *Colymbus glacialis*. Frequent in winter. One shot by Capt. G. W. Cosens was in the act of swallowing a large trout.

BLACK-THROATED DIVER, *C. arcticus*. Once in breeding plumage. Immature birds are not infrequent.

RED-THROATED DIVER, *C. septentrionalis*. Common in winter. One seen on May 6th showed no red upon the throat. On April 5th, 1893, I saw parties of five and twelve fishing near together in shoal-water.

GREAT CRESTED GREBE, *Podiceps cristatus*. Very seldom obtained, and never met with in breeding plumage.

SCLAVONIAN GREBE, *P. auritus*. A winter visitor, chiefly to the Dovey, whence Capt. G. W. Cosens and Mr. F. T. Fielden have obtained examples.

LITTLE GREBE, *P. fluviatilis*. Common, especially in the ditches at Borth.

STEGANOPODES.

GANNET, *Sula bassana*. Those which occur are chiefly storm-driven birds, washed up or found in fields some miles inland.

CORMORANT, *Phalacrocorax carbo*. The Craig y Deryn, or 'Bird Rock,' six miles from Towyn, is well known as an inland breeding station of the Cormorant. Upon the steeper face of the crag each whitened shelf or bracket-like projection supports a nest or two. The old birds sail out from the upper ledges with expanded wings and outstretched neck. Others, coming in from fishing, whizz overhead, and greet the occupants of the nest, as they land upon it, with a resonant bray. At the foot of the rock are scattered nesting-materials, egg-shells, and fragments of trout from the lakes and flat-fish from the sea. The young birds while in the nest keep up a fretful, crooning noise. In August and September they go down to the river below, where many are shot. In 1894 there appeared to be about forty nests, and for the first time a pair or two nested upon an outlying spur of the rock at a much lower level than the rest. On Aug. 31st two white-breasted young birds were still upon the nesting-ledge. The sitting birds, when disturbed, have a habit of blowing out their pouches menacingly. Upon the coast nearer to Aberystwyth, the Cormorant has several much-frequented perching-places, notably the one just to the north of the town, but none appear to breed nearer than Cwm Tydi, south of which point I found about a dozen nests containing newly-hatched young ones on May 13th. There is another small colony upon the cliff at Llangranog.

SHAG, *P. graculus*. Seldom occurs at Aberystwyth, and does not breed upon this part of the coast. It doubtless nests south of New Quay, where there are caves and fissures exactly suited to its requirements.

TUBINARES.

FORK-TAILED PETREL, *Procellaria leucorrhœa*. Occasionally occurs during rough weather. Mr. Hutchings has preserved a fair number.

STORM PETREL, *P. pelagica*. Frequently seen or obtained during westerly gales in autumn and winter. On Oct. 24th, 1894, one was seen from the terrace amongst the crests of the waves close inshore.

COLLARED PETREL, *Æstrelata torquata*. The occurrence of

this wanderer from southern seas near Borth about five years since was recorded in 'The Zoologist' (1890, p. 454).

CAPE PIGEON, *Daption capensis*. I recognised an example of this bird in the collection at Gogerddan, and was informed by Sir Pryse Pryse that it was shot by one of his sons in 1879 on the Dovey. Mr. Mathew, who records an example at Bournemouth (Zool. 1894, p. 396), tells me that this makes the third instance of the occurrence of this Petrel upon the British coast.

FULMAR, *Fulmarus glacialis*. Mr. Hutchings believes that he has had five or six examples. One of these, which I have seen, was shot off the castle at the beginning of January, 1892.

MANX SHEARWATER, *Puffinus anglorum*. Common in the Channel, but seldom seen inshore unless washed up after rough weather. On May 15th, and again on June 17th, 1893, both still and sultry nights, I heard its unmistakable note from the terrace at Aberystwyth. The birds were evidently hawking to and fro very near inshore.

ANSERES.

GREYLAG GOOSE, *Anser cinereus*. Of rare occurrence at the present day. At the end of December, 1892, a frost, which lasted for about three weeks, caused a most unusual visitation of Wild Geese to the Dovey. Capt. G. W. Cosens received a Greylag, one of three shot from a flock of nine by General White's gamekeeper close to Glandovey. Mr. Pryse, of Lodge Park, obtained one about the same time, probably a member of the same party.

BEAN GOOSE, *A. segetum*. Shot by Mr. Pryse early in January, 1893, during the spell of cold weather just alluded to.

PINK-FOOTED GOOSE, *A. brachyrhynchus*. Six are said to have been shot by Mr. Pryse at the same time as the last. One of them is preserved at Lodge Park in a case with a White-fronted Goose, the latter being another memento of the same frost. I have made careful enquiry into this occurrence, as the present species seems to be a rare straggler to the western coast.

WHITE-FRONTED GOOSE, *A. albifrons*. A small flock of about thirty visits the Teifi Bog every winter. In 1892 they stayed till the beginning of May. One or two are generally shot, and in 1892-93 five were thus obtained. Capt. G. W. Cosens has a specimen from this bog. Col. Fielden obtained one on the Dovey, Dec. 21st, 1890. There is another from the same locality

at Gogerddan, shot during the great frost of January, 1855; while others occurred to Mr. Pryse in January, 1893, one of them, a fine gander, being preserved at Lodge Park.

BRENT GOOSE, *Bernicla brenta*. Visits the Dovey every winter. On Jan. 9th, 1893, I saw two parties, numbering in all about thirty.

BERNICLE GOOSE, *B. leucopsis*. I have heard of no recent occurrence, but there were some in the Dovey during the Crimean winter of 1854-55.

WHOOPEE, *Cygnus musicus*. Swans are frequently reported, but the majority of them certainly belong to the next species. Mr. Hutchings has had several Whoopers, and a case at Nanteos contains two which were killed by Col. Powell on the Teifi Bog in the winter of 1854-55.

BEWICK'S SWAN, *C. bewicki*. Seen or obtained during every hard frost. Mr. F. T. Fielden saw eleven in the Dovey on March 2nd, 1890; parties of two and eight respectively in 1893, besides a large flock, which he could not count, flying past Aberdovey out to sea. In January, 1893, Capt. G. W. Cosens, of Llanbadarn, noted a flock of eight flying low over his house up the Rheidol Valley. About the same time a flock of forty-two remained for some days upon one of Sir Pryse Pryse's lakes. A pair of Mute Swans kept upon the same pool easily put the whole of them to flight. They used to take wing one by one with musical clamour.

EGYPTIAN GOOSE, *Chenalopex ægyptiacus*. A fine example of this introduced species was shot in 1892 from a small flock which was passing up the coast.

SHELDRAKE, *Tadorna cornuta*. Very numerous in the Dovey and Barmouth rivers, and increasing, as Mr. F. T. Fielden informs me. The fishermen used frequently to get their nets round a whole brood, but the practice has been stopped by one or two prosecutions. Breeds in the warren at Borth, and along the greater part of the Merionethshire coast, especially about Mochras Island. Where the Cambrian line skirts the Dovey flocks of from twenty to thirty may constantly be seen from the train, and in June pairs of old birds with their broods may be noted within a few yards. On April 9th, 1894, there were not less than two hundred Sheldrakes in the river between Glandovey and the sea. On July 3rd, 1893, I noticed two old birds in charge of twenty-

two young ones, but this was doubtless due to an amalgamation of broods. On May 9th, 1893, at Wallog, eggs were found in a burrow at the top of the cliff, a situation which seemed better suited to a Jackdaw.

WIGEON, *Mareca penelope*. Large flocks appear upon the Dovey at intervals all through the winter. They get unsettled about the first week in March, preparatory to departure.

GARGANEY, *Querquedula circa*. An example shot upon the Teifi Bog about twenty years since is preserved at Crosswood. Mr. Hutchings has received another more recently.

TEAL, *Q. crecca*. Occurs on the Dovey in flocks of thirty or less. Breeds on the Teifi and Borth bogs, and probably sparsely in other localities.

PINTAIL, *Dafila acuta*. An occasional visitor to the Dovey from October to March. Mr. F. T. Fielden has obtained four examples.

WILD DUCK, *Anas boscas*. Common; breeding chiefly upon the lowland bogs, but sparingly in suitable spots upon the hills.

GADWALL, *Chaulelasmus streperus*. One obtained by Mr. F. T. Fielden upon the Dovey, Dec. 6th, 1889.

SHOVELLER, *Spatula clypeata*. Obtained not uncommonly, generally upon the Dovey, whence there is a drake in fine plumage at Gogerddan. Mr. F. T. Fielden saw a flock of five on Dec. 9th, 1890.

POCHARD, *Fuligula ferina*. Occurs irregularly and in small numbers.

TUFTED DUCK, *F. cristata*. Small flocks of six or eight visit the Dovey at times.

SCAUP, *F. marila*. Upon the Dovey occurs chiefly in small flocks in October, though single birds are met with later.

SCOTER, *Ædemia nigra*. In flocks upon the sea off Aberystwyth from November to March.

VELVET SCOTER, *Æ. fusca*. Mr. F. T. Fielden has met with one example at Borth.

GOLDENEYE, *Clangula glaucion*. A few are seen most winters upon the Dovey, and several have occurred upon inland pools. Mr. F. T. Fielden has only once noted an adult male.

LONG-TAILED DUCK, *Harelda glacialis*. An occasional visitor to the Dovey, but decidedly scarce. Two examples obtained by Mr. F. T. Fielden. One was shot in the winter of 1893-94 upon Nanteos Lake.

SMEW, *Mergus albellus*. A few occurrences, chiefly of females or immature birds, have been noted. There is an adult male in full plumage at Nanteos.

GOOSANDER, *M. merganser*. A few are seen most winters, chiefly upon the Dovey. Mr. F. T. Fielden has once met with the adult drake.

RED-BREASTED MERGANSER, *M. serrator*. Visits the Dovey in small flocks. Several are obtained every winter.

It will be seen that, omitting introduced species, the foregoing list enumerates 209 Cardiganshire birds. Of these the Lesser Whitethroat and Tree Sparrow must be regarded as doubtful. Mr. Mathew is able to include 229 authenticated species in his Pembrokeshire list, the presence of the greater number being explained by the more favourable position of that county as regards stragglers from the south.

I am indebted to Mr. Hutchings, of Aberystwyth, for much information as to the birds which have passed through his hands during the thirty years in which he has been in business as a taxidermist.

ON THE "HEPATIC" PLUMAGE OF THE CUCKOO,
CUCULUS HEPATICUS, SPARRMAN.

BY THE EDITOR.

IN the month of April last a hen Cuckoo in the rufous stage of plumage characteristic of immaturity was shot by a game-keeper in the grounds of Beech-hill Park, Waltham Abbey, and the following morning it was placed in my hands for inspection by Mr. Rowland Ward, of 166, Piccadilly, to whom it had been forwarded for preservation. I had thus an opportunity of examining it carefully before it was skinned, and of noting the following description of it.

In general appearance it resembled a female Kestrel (*Tinnunculus*), for which it seems to have been at first mistaken by the person who shot it. The dorsal plumage (including the entire head from base of bill, and nape) was of a cinnamon colour, each feather with three or more bars of brownish black; rump uniform cinnamon colour without any barring. Tail-feathers ten, graduating from the centre pair, which are the longest,

for the greater part cinnamon, broadly barred towards the extremities with black, and tipped with white; immediately above the broad bar a few narrower incomplete bars across a portion of both webs (most conspicuous in the two outer rectrices on each side) alternating with white spots along the shaft; the two central rectrices being only faintly barred towards the extremities. Remiges ten, the third the longest in the wing, dusky black with numerous cinnamon-coloured spots on both webs; those on the inner webs converging into white spots extending to the outer margin of the web.

Chin, throat, sides of face, neck, and upper portion of breast dusky white, each feather with two crescentic narrow bands of black. Lower portion of breast, and rest of under parts pure white, transversely barred with black; vent nearly white; under tail-coverts white, with narrow black V-shaped markings. Under wing-coverts white with narrow transverse black lines. Bill horn-colour, yellow at base; inside of mouth, tarsi, and toes orange-yellow. Irides yellowish brown.

On dissection the bird proved to be a female, but with no marked development of the ovaries.

This peculiar phase of plumage in the Cuckoo has been long known and described by several continental writers, but is of such infrequent occurrence in England as to deserve some notice when met with. So long ago as 1778, Sparrman figured an example in his 'Museum Carlsonianum,' Fasc. iii. pl. 55, under the name *Cuculus hepaticus*. In 1802, Bechstein, in his 'Ornithologisches Taschenbuch,' described it as *Cuculus rufus* (Theil i. p. 84). As from what follows it will be seen that there is a difference of opinion as to whether it is a young bird *before* or *after* its first moult, it may be well to quote here Bechstein's description, which is as follows:—

"Rothbrauner Kuckuck (*C. rufus*, mihi). Braunroth mit schwarzen Querstreifen; der Schwanz rothbraun, mit breiten winklichen schwarzen Querstreifen.

"Variirt in der Farbe; denn das Weibchen ist minder regelmässig gezeichnet, und auf dem rothbraunen Rücken schwärzlich und weiss gesprengt.

"Anmerk. Es hat mir immer geschienen, als wenn dieser Vogel eine besondere Art sey; Andere geben ihn aber für eine blosse Farben-varietät aus, und zwar für ein junges Weibchen."

Here we may note that from the expression "reddish brown back speckled with blackish *and white*," that Bechstein was describing a young bird in the nestling plumage, in which we are accustomed to see it in late summer and early autumn—that is, before it quits this country, and before it has moulted. For the specimen which I have just examined, and which I take to be the *Cuculus hepaticus* of Sparrman, but not the *Cuculus rufus* of Bechstein, has no white spots on the back, the dorsal plumage being, as above stated, of a cinnamon colour, each feather with three or more bars of brownish black, and the rump of a uniform cinnamon colour without any barring.

Latham, in his 'Index Ornithologicus,' 1790 (vol. i. p. 215), followed Sparrman (*op. cit.*) in treating it as a distinct species from *Cuculus canorus*, and his description contains no mention of white spots on the dorsal region.

Naumann, in his 'Vogel Deutschlands,' 1826, has figured a red Cuckoo (vol. v. pl. 128, fig. 2) with the bill black, and yellow at the base, which he characterises as a female in the second year (♀ *zweijährig*) of *Cuculus canorus*.

Amongst others of the older writers who have referred to this red phase of plumage may be mentioned Gmelin, Syst. Nat. (1788), i. p. 409; Le Vaillant, 'Oiseaux d'Afrique,' v. pl. 201; Retzius, 'Fauna Suecica,' 1800 (p. 100, no. 51); and Nilsson, 'Ornithologia Suecica,' 1817 (i. p. 119, no. 58), who at that date felt persuaded that it could not be the plumage of the young bird of the year. But see 'Scand. Fauna,' pl. 66.

Temminck, who has devoted several pages to a consideration of *Le Coucou roux, ou le Cuculus hepaticus des méthodes* (Man. d'Orn. 1820, Partie 1re, pp. 383—388), states that, according to his observations, it is merely the common grey Cuckoo in its second year (p. 384), and further on he expresses the opinion (p. 385) that the *Cuculus hepaticus* of Sparrman is the young "a year old" of the common Cuckoo. It is to be presumed from this that he means "after it has once moulted," for he draws a distinction between the young bird in its first plumage and the so-called "*Coucou roux* (non point les jeunes de l'année qui sont aussi roussâtres, mais le *Cuculus hepaticus*"), which he says is very common in the south, beyond the Alps, throughout Italy, and in Eastern Europe, where the grey Cuckoo is rare. "In early spring," he says, "I have often followed for hours *pairs*

of these red Cuckoos [suggestive of their breeding before they acquire the adult plumage], and in the month of April I have seen a great many in the markets of Italian towns, indifferently males and females, the grey birds very rarely, or not at all.' He adds:—"Every one knows that in spring only grey Cuckoos are found in the north, but amongst them are sometimes seen individuals of a pale reddish tinge. That our Cuckoo should be red during the first year of its life is not so strange when we consider that it is reddish in its earliest stage, and that it emigrates in this first plumage."

Varying his phraseology, Temminck has also expressed his views on this subject as follows (*op. cit.* p. 383):—"The bird to which naturalists refer under the name *Coucou roux* seems to me to be nothing more than another phase of the *Coucou gris*, probably the same bird a year old. Several naturalists have mistaken the young Cuckoo for the *Coucou roux*, because the plumage of the young always shows slight traces of rufous bars. Others have supposed the *Coucou roux* to be the female of the grey bird, but they are equally mistaken, for there is no difference in the plumage of the sexes. Several red Cuckoos which I have dissected were males."

This statement appears to have been generally overlooked by subsequent writers on the subject. Mr. Seebohm, for example, in his 'British Birds' (vol. ii. pp. 384-385), after correctly describing the nestling plumage as having the "upper parts barred with chestnut and tipped with white," adds that "after the first spring moult the difference between the sexes is much greater; the male loses nearly all the chestnut on his plumage, but retains the white edges to the feathers; whilst the female moults into what is called the 'hepatic' stage, in which the chestnut is increased in brilliancy, and the white edges to the feathers disappear." This, at least, Mr. Seebohm infers to be the case from an examination of a large series of skins; but that this view requires modification is evident from Temminck's statement that several red Cuckoos which he himself dissected were males.

Mr. Seebohm further remarks (*op. cit.* p. 385) that "these females just entering their second year do not breed," although Temminck asserts that in early spring he has often followed for hours *pairs* of red Cuckoos.

The nestling plumage of the Cuckoo has been accurately de-

scribed by many other authors, amongst them by Selby and by Yarrell, and yet on one point these two authors are at variance. Selby remarks (Ill. Orn. vol. i. p. 401):—"The young females have more of the reddish brown disposed over their plumage, and have little or no appearance of the white patch upon the forehead and hind part of the head. In this plumage, and till after the second moult, they answer to *Cuculus hepaticus*."

From Professor Newton's statement of the case in the fourth volume of Yarrell's 'British Birds' (vol. i. p. 407) we are led to infer that in the plumage described by Selby the bird is *Cuculus rufus*, and that the term *hepaticus* is applicable to the nestling stage. I am inclined to consider Selby's view the more correct. The subject is a puzzling one, and it is complicated by Temminck's notion that *rufus* and *hepaticus* indicate one and the same phase of plumage, which is *not* the nestling stage, but a stage intermediate between that and the adult plumage.

We have then to consider what change takes place in a young Cuckoo between its leaving this country in autumn and returning to us in the following spring. Does it moult twice in seven months, between September and April, *i. e.*, first from the nestling plumage into the hepatic stage, and secondly from the latter into the adult grey plumage? This does not seem likely. It is more probable that the hepatic condition is reached without any moult, merely by the growth of the feathers and gradual wearing off of their tips in autumn,* and then by a moult of the hepatic plumage in the succeeding spring the adult plumage is assumed. In this way only does it seem possible to account for a phenomenon hitherto unexplained. If this view be correct, a red Cuckoo in England in April will be one that has completed on the Continent its nestling or first year's plumage (which it does not stay long enough to do in this country), but which has not gone through the spring moult that would transform it into the grey plumage of the adult bird. Just such a bird as this was shot in April under Mount Lebanon by Mr. Cochrane. Canon Tristram, in a paper on the Birds of Palestine (Proc. Zool. Soc. 1864, p. 432), described it with diffidence as a new species, *Cuculus libanoticus*, chiefly on the ground that, having been obtained in

* See Meves, "On the Change of Colour in Birds through and irrespective of Moulting" (Zool. 1879, pp. 81—89).

April, it could not be a bird of the year; but it apparently did not occur to him that it might have been a bird of the previous year which had not yet moulted.

Examples in this hepatic plumage are of rare occurrence in England, for the reason that young Cuckoos, after leaving this country, moult in their winter quarters before returning to their summer haunts.

Mr. Dresser, who has naturally referred to this subject in his 'Birds of Europe' (vol. v. p. 200), but who like others is in error in supposing that the hepatic plumage is confined to the female Cuckoo, describes one (which happened to be a female) shot by Mr. W. T. Blanford near Shiraz, in Persia, in May, 1870; and another in his collection that was obtained at Hampstead, also in the month of May, "in change between this plumage and the grey dress of the adult bird."

Messrs. Gurney and Fisher have recorded the occurrence of a red Cuckoo on the 5th of May at Letton, in Norfolk,* and subsequently it appears that a second example came under Mr. Gurney's notice in the same county.†

One shot at Doddington, in Kent, about 1850, is preserved in the Cambridge Museum, and is noticed by Prof. Newton in his article on the Cuckoo, published in September, 1881, in the 4th edition of Yarrell's 'British Birds' (vol. ii. p. 407).

So long ago as 1866, in the first book which I ventured to publish, *viz.*, 'The Birds of Middlesex,'—the precursor of so many county avifaunas,—I remarked upon the rarity in this country of what I then supposed to be *adult* Cuckoos in the reddish-brown plumage. Two examples then known to me were supposed to be adult because they had been obtained in spring, and because, strange to say, one of them was reported to have been observed in the same neighbourhood for three summers, and the other for five or six. At the present time this strikes me as an extraordinary statement to have made, though I well remember that it was so made on the authority of an excellent ornithologist, the late Frederick Bond.‡ Since that date until the present time I have never seen another example of a red Cuckoo obtained in

* "Account of Birds found in Norfolk" (Zool. 1846, p. 1315).

† Stevenson, 'Birds of Norfolk,' vol. i. p. 309.

‡ See the memoir of him (Zool. 1889, pp. 401-422).

spring; but strange to say, the specimen which has just been received by me from Bishops Waltham, Essex, was forwarded with the information that "it was there last season as well as this, and was often heard to sing 'cuckoo.'"

To explain these three cases we must assume either that the Cuckoo, from some unknown cause, may live for several years without moulting, which is not likely; or that it is dimorphous like the Crow,* or again, that observers, on seeing red Cuckoos year after year in the same locality, must have been mistaken in supposing that they were the same individual birds which had returned to their former haunts. Of course, if they were not the same birds, we are forced to the conclusion that red Cuckoos in spring are not so rare as has been commonly supposed.

Referring again to what I wrote in 1866 of the only two examples then known to me, I find the remark, "They were both females, and I believe an adult male of this colour has never been obtained." Evidently at that date I had not read Temminck's statement that he had dissected red Cuckoos of *both sexes*, nor were Messrs. Dresser and Seebohm, apparently, aware of this fact when they published their respective works. Verily we live to learn.

MEMOIR OF PROFESSOR HUXLEY.

WITH the departure from our midst of the Rt. Hon. Thomas Henry Huxley, LL.D., F.R.S., a shining light has gone out in the world of science. On the 29th June, at Eastbourne, he passed peacefully away, in the 70th year of his age. His death cannot be said to have been unexpected, for the state of his health for some time past had been such as to cause grave anxiety to his friends. Early in the year he had been stricken with influenza, and complications followed affecting the kidneys and heart, from which it soon became evident there was but little hope of recovery. Conscious to the last, he set a brave example of that composure and fortitude which is never more impressive than when displayed by one who is conscious of his approaching end.

For the last ten years he may be said to have practically retired from active life, having been compelled in 1885, through

* Cf. Newton, in Yarrell's 'British Birds,' vol. ii. p. 274.

ill health, to resign all his public appointments ; though so recently as May, 1893, he delivered the second "Romanes Lecture" at Oxford, and from time to time contrived to keep in touch with public life by the occasional utterance of an after-dinner speech, or the publication of a magazine article on some topic of the day. In one of the healthiest parts of the south of England he at length sought that quietude and repose which most men look for, or at least hope for, towards the close of life, and in the use of books, the cultivation of flowers, and the society of friends, he found a daily source of enjoyment. His busy mind, however, would not allow him to remain long idle, as he would term it, and we believe that at the time of his death he had in preparation an essay on "Saxifrages," to which plants he had for some time previously been paying close attention. For, although not a professed botanist, Prof. Huxley upon occasion wrote ably upon botanical subjects ; witness his paper upon "Gentians," published in the 'Journal of the Linnean Society' (vol. xxiv. 1887, pp. 101-124), and his Lecture at the Royal Institution upon the Border-land between Animals and Plants. Few men have worked harder to gain a reputation in the scientific world ; few have more ably earned it.

The son of a schoolmaster at Ealing, where he was born in May, 1825, he had but a brief school career, and had early to decide upon a profession. His inclination, he used to say, was to become a mechanical engineer, but it was thought better for him to apply himself to medicine. Having gone through a course of study at the Charing Cross Hospital Medical School, he graduated M.B. at the University of London in 1845, and qualified himself, in 1846, to act as a surgeon in the navy by becoming M.R.C.S. He used to declare in after years that the only part of his professional course that really interested him was the physiology—"the mechanical engineering of the living machines." It was at Haslar, when acting as assistant-surgeon, that Huxley came under the influence of Sir John Richardson, the famous Arctic traveller and naturalist, and to this association may perhaps be attributed his subsequent abandonment of physic for physiology. His first appointment as assistant-surgeon on board ship was to the 'Rattlesnake,' which was ordered by the Admiralty to make a survey of the Barrier Reef on the eastern coast of Anstralia, and also to explore the

sea between that reef and New Guinea and the Louisiade Archipelago. Just as Darwin's chance of distinguishing himself in science came to him when he was appointed as naturalist on board the 'Beagle' in her voyage round the world, so Huxley's post on the 'Rattlesnake' served as his introduction to scientific fame.

It was by his careful and minute study of the marine animals which were collected in the far-off seas visited by the vessel of which he was surgeon that he established the scientific reputation so early begun. His observations on the anatomy and affinities of the *Medusæ* and other marine forms appeared from time to time in the publications of the Royal and the Linnean Societies, and the Ray Society issued his important work on 'Oceanic Hydrozoa.' It was not till 1850 that his four years' voyage ended, and when it did there also ended Huxley's connection with the Royal Navy. In order to devote himself to science he resigned his position, and set himself vigorously to the work of arranging and tabulating the facts which he had accumulated during the voyage.

In 1851 he was elected a Fellow of the Royal Society; in 1852 received one of the Society's Royal Medals; and in 1853 published, in the volume of the Society's 'Transactions,' a memoir on "The Morphology of the Cephalous Mollusca." Up to this time his scientific labours had been carried on upon but slender pecuniary resources, but in 1854 he was appointed to a Government position as Professor of Natural History and Palæontology in the Royal School of Mines, succeeding Prof. Edward Forbes in the chair. He was also given the curatorship of the fossil collections in the Museum of Practical Geology.

In course of time he became Fullerian Professor of Physiology at the Royal Institution, and Examiner in Physiology and Comparative Anatomy to the London University. As Croonian Lecturer to the Royal Society, to which post he was elected in 1858, he chose for his subject, "The Theory of the Vertebrate Skull." Jointly with Professor Tyndall, he was the author of 'Observations on Glaciers,' a work resulting from a visit paid by the two friends to Switzerland in 1856. Vertebrate morphology and palæontology, however, were the subjects which chiefly engaged his attention in these years, and by his works on these subjects he will always be best remembered.

In 1858 he was elected a Fellow of the Linnean Society, and was one of the earliest recipients of the Gold Medal which was founded to commemorate the centenary anniversary of that Society. In 1862 his fame as a biologist led to his election as President of Section D of the British Association, and eight years later he was elected President of the Association itself. In 1872 he became Lord Rector of Aberdeen University. After serving for some years on the Council of the Royal Society, he acted as Secretary to that learned body from 1872 to 1881, and in 1883 was elected President, which distinguished position he held until 1885. His eminence as a representative of science in this country was acknowledged by his Sovereign, when in 1892 he was made a Privy Councillor, and thus became entitled to be addressed as Right Honourable.

Nor were foreign nations slow to recognise his extraordinary talents. The honour of being a Corresponding Member of the French Academy of Sciences in the subjects of anatomy and zoology fell to him in 1879; and it may be mentioned as proof of the world-wide spread of his reputation, that honorary degrees of one kind or another were conferred on him by the universities and scientific societies in most of the principal cities of Europe and America, the United States showing its agreement in our English estimate of his abilities by electing him a Foreign Member of its National Academy.

As pointed out by Prof. Haeckel ('Nature,' ix. p. 258), he has made us better acquainted with several interesting members of the class Vermes; Sagitta, Lacinularia, and some lower Annulosa. "He was the first to point out the affinities of Echinodermata with Vermes. In opposition to the old view that they belong to the Radiata, and on account of this radial type are to be classed with corals, medusæ, &c., he showed that the whole organisation of the former is essentially different to that of the latter, and that the echinoderms are more nearly related morphologically to worms. Further, he has essentially enlarged our knowledge of the important group of Tunicata by his researches on the Ascidians, Appendicularia, Pyrosoma, Doliolum, Salpa, &c.

"Many important advances in the morphology of the Mollusca are also due to him. Thus, *e.g.*, he has greatly elucidated the controverted subject of the homology of regions of the body in the Mollusca. But it is the comparative anatomy and classifica-

tion of the Vertebrata which he especially studied and advanced. His excellent 'Lectures on Comparative Anatomy,' 'Elementary Physiology,' 'Introduction to the Classification of Animals,' and 'Anatomy of Invertebrate Animals,' afford abundant proof of this, to say nothing of his numerous important monographs on living and extinct fishes, amphibians, reptiles, birds, and mammals."

In one only of the many appointments which he held did he fail to shine. This was the Inspectorship of Salmon Fisheries, which he applied for and secured on the death of Frank Buckland. For this post he was unsuited, possessing none of the instincts of the out-of-door naturalist* or fisherman, and having therefore little appreciation of the requirements needed in the way of fishery legislation, and the best way of amending it. Nor had he even that indispensable acquaintance with the Salmon in all stages of its existence, all known by various local names, which cannot be learnt from "spirit specimens," and which was possessed, for example, by the late Surgeon-Major Francis Day (Zool. 1889, p. 306), who was also a candidate for the post, and who from his practical knowledge of the subject would have made a far better Inspector of Fisheries. To a man of Prof. Huxley's calibre the uncongenial nature of the duties attaching to the office, and the long railway journeys necessitated by periodical inspections in distant parts of the country, soon became burdensome, and it was therefore not long before he resigned the appointment, although not until he had prepared a valuable report, with the aid of Mr. George Murray, on the nature of that troublesome disease in Salmon, *Saprolegnia*. His monograph on the Crayfish also (Internat. Sci. Series, 1880) marked this epoch in his life.

Perhaps the most noteworthy fact in Prof. Huxley's career is that he did more than any other man to uphold and promulgate the doctrine of evolution. It was in 1858 that Charles Darwin and Alfred Russel Wallace simultaneously laid their great theory of 'Natural Selection' before the Linnean Society, and in the

* He said of himself:—"I am afraid there is very little of the genuine naturalist in me. I never collected anything, and species work was always a burden to me. What I cared for was the architectural and engineering part of the business, the working out of the wonderful unity of plan in the thousands and thousands of the diverse living constructions and the modifications of similar apparatuses to serve diverse ends,"

November of the following year Darwin's 'Origin of Species' was published. The effect of the speculations and conclusions of that great naturalist on Prof. Huxley was immediate and profound, as may be seen from his appreciative remarks in the 'Westminster Review' for April, 1860. At the present day it is difficult to realise what a revolution in the world of thought was caused by the new doctrine. To most theologians it was irreligious. To many men of science it was a seductive fallacy. Owen, the *doyen* of English anatomists, never adopted it. The French naturalists would have none of it. Very few of the most eminent British *savants* gave it a whole-hearted acceptance, but foremost amongst these was Huxley, who to the last remained steadfastly the champion of "Darwinism."

His wide reading, clear thinking, and vigorous writing made him a formidable controversialist, and it has been well observed of him by a recent writer that his success in life is striking proof of the predominance of the literary faculty. It was his clear philosophic reasoning and that literary gift which Darwin so greatly envied that made him the potent personality he was to his contemporaries, and will ever be to posterity.

NOTES AND QUERIES.

MAMMALIA.

The Marten and Polecat in Wales.—On Jan. 24th an adult Marten was sent to Mr. Hutchings, of this town, for preservation. It was obtained near Llanberis, and is now in the possession of Mr. J. W. Wyatt, of East Court, Wells. A younger example, not full grown, was received from the same locality twelve months previously, both being trapped upon the same property. As confirming what I have already stated as to the abundance of the Polecat in this district, I may mention that fifteen examples were captured during the first three months of the present year.—J. H. SALTER (University College, Aberystwyth).

Albino Shrew in Yorkshire.—On June 25th my friend Major Arundel, of Ackworth, in the West Riding, sent me a beautiful white specimen of the Common Shrew, *Sorex araneus*, which on the previous day he had picked up dead on the road between Ackworth and Pontefract. It is perfectly white, without a dark hair anywhere, and the eyes were devoid of pigment. I was very much afraid at first that I should be unable

to preserve it, as the hair was beginning to slip badly upon the abdomen; but setting to work with great care, it has turned out a very pretty little specimen.—OXLEY GRABHAM (Flaxton, York).

BIRDS.

Sale of Great Auk's Egg.—Another egg of the Great Auk has lately changed hands (*vide antea*, p. 193). On June 25th last, Mr. J. C. Stevens offered for sale by auction in his well-known room in King Street, Covent Garden, an egg of *Alca impennis*, from the collection of Baron Louis d'Hamonville. The history of this egg as given in the Sale Catalogue is as follows:—"Lot 211. Egg of the Great Auk. Taken in Iceland about 1830 by a shipowner of St. Malo, who bequeathed it to the Comte Raoul de Baracé, whose collection was purchased by the Baron d'Hamonville. This specimen (slightly cracked), which in colouring and texture is unique, was figured in the 'Mémoires' of the Société Zoologique de France, 1888 (pl. vi. fig. c), and additional notes on its history appeared in the 'Bulletin' of the same Société in 1891."

Mr. Symington Grieve, in his work on the Great Auk, referring (Appendix, p. 25) to the three eggs of this bird in the collection of the Comte de Baracé at Angers, states that they came "from Iceland by way of St. Malo, some time before 1837"; but, according to his own showing (*op. cit.* p. 104), one of them seems to have been procured in Paris by the Abbé Vincelot of Angers, from whom it was purchased by the Comte de Baracé, who obtained another of them from Fairmaire of Paris. What authority there is for fixing the date of the third example (which according to the recent sale catalogue was "taken in Iceland about 1830") is not stated, nor is any evidence afforded that the finder was a shipowner of St. Malo. The French expression may have been "armateur," but possibly the word intended was "amateur." However that may be, the egg just sold by auction was one of three which belonged to the Comte de Baracé, and which subsequently came into the possession of the late owner, Baron d'Hamonville. The latter has published in the 'Bulletin' of the Société Zoologique de France (1891, pp. 34—38) the history (so far as he could collect it) of each of them, having previously furnished coloured figures of the natural size (together with a similar figure of Yarrell's specimen, which he acquired in 1875, on his purchase of Bond's collection), in the 'Mémoires' of the same Société for 1888 (pp. 224—227, Pls. V.—VI.). One of these M. de Baracé had purchased through Fairmaire of Paris in 1858 from the Baron de Vèze, who had bought it of Parzudaki of Paris, in 1855, for 500 francs. It became the property of Baron d'Hamonville in March, 1887. The two others, it appears, came from Iceland (as stated by M. de Baracé in a letter to Dawson Rowley dated Jan. 13, 1867), whence he had received them more than thirty years before (about 1834 or 1835),

through an *armateur* (or *amateur*) resident at St. Malo, and it is one of these which has been sold. The peculiarity about this specimen, which is described in the sale catalogue as being "unique in colouring and texture," is that the markings upon it, more numerous on the sides than at the larger end, are of a pale *green* colour, most unusual in eggs of this species. Although the specimen is slightly cracked, this did not prevent a bid of 100 guineas being made for it. The biddings advanced by five and ten guineas at a time, until the sum of 165 guineas was reached, at which price, there being no further advance, it was knocked down to Mr. T. Jay, of Regent Street.

Notable increase of the Lesser Tern in Co. Mayo.—To any naturalist visiting the estuary of the Moy and Killala Pool, the elsewhere unusual but interesting sight of four species of Terns fishing in company may be witnessed any day, the species being the Sandwich, Common, Arctic, and Lesser Terns. The first-named breeds on the little island-lake of Rathronyem, the second on Lough Conn, and also, in company of the Arctic and Lesser Terns, on the "Inch" and Ross shore by Killala Pool. The breeding haunt of the Lesser Tern, *Sterna minuta*, the "Inch," is the largest of a small group of gravelly islands situated at the end of the little peninsula of Ross, but as it is the only one uncovered by the spring tides, it is the haunt of the Terns, whose eggs are placed above the level of the high tides. Ross peninsula is about a mile in length and half-a-mile in width at its broadest parts, the western side being a low sandy flat, the shore of a little sheltered bay; while the eastern side consists of a range of low sand-hills, the boundary of the Pool and channel running to the open sea. The usual stock of Lesser Terns breeding on the Inch generally consisted of ten or twelve pairs, some years less, while that of the Common and Arctic Terns, of perhaps twice that number. On June 14th, when visiting this breeding haunt, I found to my surprise the numbers of the birds greatly increased: at least twenty pairs of Little Terns appeared flying about and resting on the shores, while fully twenty to thirty pairs of the larger species were in sight also. Landing on the Inch, we found several nests of the Common and Lesser Terns, some on the bare stones without any attempt at nest-building, and containing from two to three eggs each; but the number of nests found being so few compared to the number of birds seen induced me to look further for the real haunt where the bulk of the birds bred; so seeing several hovering over and pitching on the peninsula, I crossed over, and then found that the three species were breeding along the shores for nearly half-a-mile. Their favourite sites for laying their eggs were on the stony bases of several little mounds that rose out of the sands where the looser parts had been blown away, leaving the stony flats and bases exposed, and here on the bare stones, and in many places on the bare sand, the eggs were laid: most of the eggs I examined

were within a day or two of hatching out, and we found one newly hatched bird lying alongside an unhatched egg. Observing several of the small Terns hovering over the sand at the end of Bartragh, I crossed the channel to the island, and found four pairs hatching on the bare sand just above high-water mark. It was the first time I had found Terns breeding on the island, although visiting it annually for the last thirty years. This sudden arrival of such large numbers of the Lesser Tern to a breeding haunt usually frequented by so few birds is very interesting, and suggests that from some unexplained cause they had probably deserted some other breeding-ground. Their nearest haunt to Killala Bay is that in Brown's Bay on the Sligo coast, between thirty and forty miles distant; but even if they had moved from that haunt it would not account for the increase in their numbers, for only about ten or twelve pairs usually breed there.—ROBERT WARREN (Moy View, Ballina, Co. Mayo).

Fearlessness of the Spotted Flycatcher.—On June 6th, 1895, I found a nest of the Spotted Flycatcher, *Muscicapa grisola*, containing five eggs; and as they were exceptionally well-marked specimens, I took both nest and eggs for my collection. On arriving at an outhouse in my garden, about fifty yards from the spot, I examined the eggs more carefully, and came to the conclusion that they were of no use to me, being apparently hard set. Therefore, after testing one of the eggs in water, I returned to the spot and replaced the nest in the fork of the tree from which I had taken it, arranging it as naturally as possible. To my surprise the old bird shortly returned to it, and recommenced sitting on the eggs as if nothing had occurred. On June 9th I revisited the nest and found young birds in it, and they are now (June 12th) doing well.—E. A. BUTLER, Lt.-Col. (Brettenham Park, Ipswich).

Language and Instincts of the Domestic Fowl.—At a recent meeting of the Oxfordshire Natural History Society, held in the Museum, Mr. G. C. Druce, F.L.S., in the chair, a lecture was given by Mr. G. J. Burch, M.A., on the language of birds. He explained that he had been led to make a series of systematic observations on the language and instincts of the domestic fowl some years ago, when the negligence of a sitting hen obliged him to undertake the care of some young chicks from the time of their leaving the shell. Hatched under these circumstances, there were special opportunities for observing the inborn faculties of the birds, and the lecturer had found that all his preconceived notions of inherited instinct must give way before the utter helplessness of the chicks. Unable at first to balance themselves on their feet, repeated efforts had to be made before they could stand. They were without any notion of picking up food when hungry, or swallowing it; indeed, the most rudimentary actions of life had to be learnt by experience. Absurd attempts to reach an object were made before any idea of distance was gained, and stranger

still the "clucking" of the hen only excited fear, though the chicks would run confidently to the hand of the lecturer. Further details were given of the habits of young birds brought up away from the parent, giving evidence of intelligence and application, but showing a lack of the usual peculiarities when unable to learn them from other members of their species. The lecturer pointed out that there are two methods of communicating thoughts and wishes—the *visible* method, *i. e.*, gesture, and the *audible*, or language, and that in man the latter had become so complete and accurate that the former was unnecessary, though in lower animals it was all-important. Keeping to the domestic fowl as a type, he admitted the great difficulty of learning its language, as the means of gesture and the organs of speech are so different from our own. By a series of lantern slides he explained the apparatus in man and in these birds for producing sounds and articulate speech, showing in each case which parts of the organs are brought into use for the different sounds. Long and close observation of the poultry yard had enabled him not only to analyze the sounds produced, and to explain them physiologically, but also to learn their significance and imitate them so successfully as to be understood by the birds themselves. He pointed out that they would not notice or answer to ordinary pet names, but looked up at once if their own call-notes were imitated. They did not understand pointing with the finger, as they themselves pointed with the head and beak. Very close investigations were given by the lecturer of the call-notes of different individuals, the alarm note, the call to food, and the cry of danger. Gestures and expressions of fear and disgust, the mode of salute, and soothing reassuring sounds heard at roosting time in the darkness were described and imitated. Distinct gestures and notes are used when one bird challenges another, and the brooding hen has a vocabulary of her own, modified and limited till her young ones are able to run about. The crowing of the cocks, though similar to the ears of the uninitiated, differs in individuals, and varies with the emotions which it expresses. Interesting accounts were given of the intelligence shown by these birds in learning to unlatch the door of a fowl-house, and in aiding a search for rats. In conclusion the lecturer urged the members of the Society to undertake further investigation into the language of birds, a study for which there is special facility in the case of domesticated species.

Young Pewits and Pheasants Swimming.—I was interested to see some young Pewits take voluntarily to the water, one in particular swimming perhaps eighty yards. I have also seen young Pheasants, only a few days old, take to the water and successfully cross a small pool of dark-coloured water in a peat-moss.—CHARLES F. ARCHIBALD (Rusland Hall, Ulverston).

Increase of the Hawfinch in Sussex.—It appears to be the almost unanimous conviction of ornithologists that the Hawfinch has extended its range and increased in numbers of late years in England; and it is pleasing to record that a careful endeavour to arrive at the true position which the

species holds in the Sussex avifauna has led me to regard it as certainly on the increase. In his 'Ornithological Rambles in Sussex' (1849), the late Mr. A. E. Knox cites but one instance of the Hawfinch breeding in the county, and adds that the bird is "of uncertain occurrence, being not unusual during some years, and comparatively rare in others" (*cf.* Borrer's 'Birds of Sussex,' pp. 126-128—though the author does not view the matter in a comparative spirit). Mr. Field, of St. Leonards, has kindly shown me eggs from a nest brought to him last year, and also those from another taken by himself during the present year. In each case the birds indulged their usual proclivity for gardens. I have also great reason to believe that another nest has been taken in this vicinity during the present year. In November, 1894, I saw two male Hawfinches feeding in the neighbourhood of Battle—the scene of the famous Norman victory—and on pointing them out to an intelligent gardener he assured me that such a sight is by no means uncommon in *winter*.—W. C. J. R. BUTTERFIELD (Stanhope Place, St. Leonards-on-Sea).

Nesting of the Hawfinch and Greater Spotted Woodpecker.—In the last number of 'The Zoologist' (p. 232), Mr. Steele Elliott gives an account of a Hawfinch's nest screened with green leaves plucked by the bird. I have never had the fortune to observe this interesting fact; but a nest that I found this year was built on a small oak sapling about nine feet high, entwined round which was a cluster of the common honeysuckle, and the bottom of the nest outside, being formed, as is usual with the Hawfinch, of green grey lichens, assimilated so closely with the colour of the under side of the honeysuckle leaves that it was most difficult to distinguish. A nest of the Chaffinch which I found deserves mention: it was in a wood, built in the fork of a small hazel, and neatly and beautifully made as usual, but studded all over outside with the chips that a Great Spotted Woodpecker had turned out of the nesting hole in an adjoining tree, which gave it a very curious appearance, and so far from being in any way protective, at once drew the attention of the eye towards it. With regard to this same Great Spotted Woodpecker, having the good fortune to find the bird at work inside the tree, and to witness the showers of chips that were expelled at the same time from the hole, I feel convinced, as was suggested by a friend of mine, that the bird uses the stiff tail-feathers as a kind of broom with which to sweep out the chips.—OXLEY GRABHAM (Flaxton, York).

Nesting of the Lesser Spotted Woodpecker near Bath.—Although the nesting of this little known Woodpecker in Somersetshire may be of more frequent occurrence than is supposed, yet the following remarks may be of interest to ornithologists, more especially to those who are interested in the avifauna of this particular county. On June 9th, accompanied by a friend, I was strolling along the side of a ditch, when I

observed a Lesser Spotted Woodpecker (*Dendrocopus minor*), with some food in its beak, fly into a high aspen, of which there were several in a row. Hurrying towards the nearest tree, we noticed a large decayed bough, about forty feet from the ground, on the under surface of which were two small circular holes, evidently bored by these little birds. Lying quietly in the grass beneath the tree, we had the pleasure of seeing the male bird (whose red cap was distinctly visible) very cautiously enter the lower of the two holes four times in the space of about twenty minutes. No climbing was necessary to ascertain what the nest contained, for we could distinctly hear the young ones. The fourth time the bird entered the hole a noise we carelessly made frightened it very much. It flew out of the hole in a great hurry, and made a noise about the trees exactly like Blackbirds do when they are disturbed by a cat, though not so loud. It also frequently "tapped" the trees after the manner of a Nuthatch. In fact, my companion, who did not perceive its exit from the hole, was completely deceived by these notes, really believing it was a Blackbird. It displayed wonderful agility while searching for food about the boughs. When a sudden or strong gust of wind threatened to blow it off its perch, it quickly crept round the opposite side of the branch. We searched carefully for the hen bird, but in vain, the cock seeming, by itself, to undertake the business of rearing the brood. Perhaps some mishap had befallen its mate. On a branch of a neighbouring aspen were several holes of the same size as that occupied, undoubtedly made by Lesser Spotted Woodpeckers, though none of them appeared to be tenanted. We left the spot, when the bird at last flew away, feeling sure that it would remain safe from molestation. The locality in which we found this nest is quite in the opposite direction to the nest of the same species which I lately recorded (p. 22). I do not feel justified, however, in naming the place, for I am anxious to see whether the birds will nest there next year. A male Lesser Spotted Woodpecker, which I received in the skin, was shot on the outskirts of the town in February last. The weather at that time was very cold, and it was obtained close to a long row of houses. Occasional reports reach me of these birds being seen about Bath, but they nearly always want confirmation.—CHARLES BETHUNE HORSBRUGH (Richmond Hill, Bath).

Nesting Habits of Curlew.—I am informed by Mr. Richard Holme, whose observations I have recorded on former occasions in this Journal, that when recently visiting a Curlew's nest on a small moss on the fells in this district, the old bird allowed him to walk past her within four or five feet without leaving the nest. This was some ten days before the young were hatched. Curiously enough, I have a note referring to the identical place, showing that four or five years ago a Curlew allowed me to approach within two yards without leaving the nest. As we are both accustomed to see Curlews rise from their eggs very wild, and have found several nests by

marking the spot from which they departed, I think it may be worth while to put this on record.—CHARLES F. ARCHIBALD (Rusland Hall, Ulverston).

Nesting Habits of the Oystercatcher.—Amongst the objects collected by these birds to form nests I have observed the dry droppings of Rabbits on more than one occasion. This was on a Rabbit warren on Walney Island. Do Oystercatchers occasionally suck eggs? On the shores of Cardigan Bay I once saw some Lesser Terns dash angrily at a "Sea Pie," which ducked its head each time. Close to the spot I found an egg, evidently sucked, though not recently.—CHARLES F. ARCHIBALD.

Nesting of the Dunlin in Wales.—It may be of interest to ornithologists to know that I found a nest of the Dunlin, *Tringa alpina*, containing four eggs, in Merionethshire on May 29th last. It was placed in some short heather on the top of Clogwyn Llwyd, a moorland 1600 feet above the level of the sea, and lying midway between Llanuwchllyn and Trawsfynydd.—H. S. DAVENPORT. [See Zool. 1893, p. 269.—ED.]

Wood Pigeons nesting near the Ground.—I have on at least two occasions found Wood Pigeons, *Columba palumbus*, breeding close to the ground, as mentioned by your correspondent Mr. Witherby (p. 232). In each instance the nest was placed in a low tuft of blackthorn, and was not a foot above *terra firma*. Perhaps the most remarkable fact was that the blackthorn scrub grew in a wood which presented every facility for nesting in trees, and other Wood Pigeons which were breeding there built in ordinary situations. I have found nests of the Stock Dove, *C. œnas*, on the ground amongst ivy where the surroundings have been rocky, but in every case the nest was near the edge of a small cliff or rocky buttress. I have also found the eggs of these birds in rabbit-holes, or ledges of rock, about old ruins, in hollow trees, in old Magpies' nests, in Squirrels' nests, once in a Wood Pigeons' nest, and in pollard willows, &c. They are now fairly plentiful in some parts of the south of Scotland, where they breed annually.—J. J. ARMISTEAD (Solway Fishery, Dumfries).

Greenfinch appropriating Thrush's Nest.—Last spring a pair of Thrushes built their nest in a yew-tree hard by my house. The old birds disappeared, and the nest being forsaken I paid no further attention to it, until one day in the middle of June I heard a great chirping proceeding from it. Having procured a ladder I went up to have a look, and on my mounting to the top four young Greenfinches scuttled out of the nest. No extra lining had been put in, and there were the four Thrush's eggs, somewhat covered with *débris*, but unbroken. The Greenfinches had unlimited opportunities for selecting more comfortable quarters.—H. MARMADUKE LANGDALE (Thorneycroft, Compton, Petersfield).

SCIENTIFIC SOCIETIES.

LINNEAN SOCIETY OF LONDON.

June 6th, 1895.—Mr. W. PERCY SLADEN, V.-P., in the chair.

The minutes of the last meeting having been read and confirmed, the Chairman, on behalf of the President, nominated the following to be Vice-Presidents:—Messrs. J. G. Baker, F. Crisp, A. Lister, and W. P. Sladen.

Mr. B. B. Woodward was elected a Fellow.

Mr. M. Buysman, who has laboured for many years to establish a garden at Middleburg for economic plants, exhibited specimens to show the excellence and completeness of his preparations.

On behalf of Mr. T. J. Mann, who had lately returned from Ceylon, Mr. Harting exhibited specimens of a butterfly, *Catophaga galena*, Felder, which had been observed migrating in thousands across the northern part of that island during March and April last, in a direction from N.E. to S.W. The movement commenced about 7 a.m. and lasted until noon, when it decreased, and was resumed in the afternoon for another two hours. Mr. Harting referred to the remarks on this subject made by Sir J. Emerson Tennent (Nat. Hist. Ceylon, 1861, p. 404, note), to the observations of Darwin on the countless myriads of butterflies met with at sea some miles off the mouth of the Plata (Nat. Voy. p. 158), and to a paper by Mr. R. McLachlan on the migratory habits of *Vanessa cardui* (Entom. Mo. Mag. xvi. p. 49). He did not think that the movement was analogous to the migration of birds, which travelled in opposite directions in spring and autumn, for the insects moved only in one direction, and did not return, vast numbers perishing *en route*. The phenomenon rather resembled what had been observed in the case of Lemmings, Locusts, and Dragonflies (Weissenborn, Mag. Nat. Hist. n. s. vol. iii. p. 516), and might be explained as a sudden exodus from the birthplace, leading to a compensating reduction of the species after a season exceptionally favourable to its increase. His remarks were criticised by Col. Swinhoe, who was inclined to confirm this view, and by Mr. Kirby, who referred to the particular species which were found to take part in these so-called "migrations."

A new *Distomum* was described by Mr. G. West, whose observations were favourably criticised by Mr. W. P. Sladen and Prof. Howes.

On behalf of Mde. van der Bosse, Mr. George Murray communicated a description of a new genus of Algæ (*Pseudocodium*), the characters of which were minutely pointed out by means of specially prepared lantern-slides.

A paper was then read by Mr. A. Vaughan Jennings on the nature of *Mobiusispongia parasitica*, on which critical remarks were made by Prof. Rupert Jones and Mr. F. Chapman.

A second paper by Mr. Vaughan Jennings contained a description of a new genus of Foraminifera of the family *Astrorhizidæ*.

June 20th.—Mr. C. B. CLARKE, F.R.S., President, in the chair.

Mr. George Masee was elected a Fellow of the Society.

Mr. F. Enock exhibited and made some remarks upon a living specimen of an aquatic hymenopterous insect, *Polynema natans*, Lubbock.

Messrs. E. Baker and C. Reid exhibited some rare plants from the limestone hills, Co. Kerry, including *Pinguicula grandiflora*, Lam., contrasted with *P. vulgaris*, and *Saxifraga gem* contrasted with *S. umbrosa*, with a view of determining their value as subspecies or geographical races.

Mr. Carruthers exhibited some feathers of a Cuckoo taken at Whitchurch, Shropshire, on May 23rd last, amongst which were some moulted feathers which were held connected with the new feathers which had replaced them by means of the barbed seed-capsules of a subtropical grass, *Cenchrus echinatus*.

On behalf of Mr. S. Loat, there was exhibited a Cuckoo's egg taken from the nest of a Hedgesparrow, together with five white eggs of that species, an abnormality not often met with. An examination of these eggs under the microscope showed that in regard to the texture or grain of the shell they agreed with eggs of the Hedgesparrow, and not with those of the Robin, of which white varieties are not so rare.

Mr. George West then gave the substance of a paper on some North American *Desmidiæ*, describing the characters of several new species with the aid of specially prepared lantern-slides.

Mr. A. Vaughan Jennings gave a detailed account of the structure of the Isopod genus *Ourozeuktes*, upon which an instructive criticism was offered by the Rev. T. R. Stebbing, who was present as a visitor; some further remarks being made by Mr. W. P. Sladen.

Mr. F. N. Williams communicated the salient points in a critical paper which he had prepared, entitled "A Revision of the genus *Silene*."

On behalf of Mr. E. R. Waite, Prof. Howes gave an abstract of a well-illustrated paper on "The Egg-cases of Port Jackson Sharks," and exhibited several spirit specimens in further elucidation of the subject.

This meeting terminated the session.

ZOOLOGICAL SOCIETY OF LONDON.

June 18th, 1895.—Sir W. H. FLOWER, K.C.B., F.R.S., President, in the chair.

The Secretary read a report on additions made to the Society's Menagerie during the month of May, and called particular attention to the following animals:—A Black-billed Sheathbill, captured at sea, 52° S., 55° W., and

presented by Mr. John Gunn; a female Grysbok, presented by Mr. J. E. Matcham, of Port Elizabeth, South Africa; and a young male Panolia Deer, from Southern China, presented by Mr. Julius Neumann.

Mr. Sclater exhibited and made remarks on the head of a Barbary Sheep, *Ovis tragelaphus*, obtained by the late Capt. Dunning on the Nile above Wady Halfeh, and the skin of a Humming-bird, *Anthocephala berlepschi*, from Colombia, received from Mr. R. B. White.

Prof. Howes exhibited and made remarks on the skull of a Rabbit showing abnormal dentition.

A letter was read from Dr. Hubrecht, showing that a supposed new mammal from Sumatra, which he had described as *Trichomanis hoevenii*, was probably nothing more than an *Arctonyx*.

Mr. Sclater exhibited and made remarks on a specimen of Loder's Gazelle, *Gazella loderi*, recently obtained in the western desert of Egypt.

Mr. W. Saville Kent exhibited a drawing of a Nudibranch from Western Australia, remarkable for its large size and brilliant colour.

Mr. J. Graham Kerr read a paper on some points in the anatomy of *Nautilus pompilius*. The morphological meaning of the arms in Cephalopods was discussed briefly. It was pointed out that the only strong basis on which the hypothesis of the pedal nature of these organs rested was that derived from the consideration of their innervation by the "pedal" ganglion or a derivative of it. The force of this evidence was completely dependent upon the assumption that this ganglion was precisely homologous with the pedal ganglia of Gasteropods; and this assumption appeared to be unjustified, the evidence of comparative anatomy pointing to the *independent* phylogenetic development of the several ganglia of Gasteropods, and of the similarly named ganglia in the higher Cephalopods, from a condition of continuous nerve-strands such as occurred in *Chiton*, *Nautilus*, and other archaic forms. The author advocated the abandonment of the view that the arms are pedal, and the resumption of what appeared the inherently more probable view, that they are processes of the head-region.

A communication was read from Messrs. F. E. Beddard and A. C. Haddon, containing an account of a collection of Nudibranchiate Mollusca recently made by the latter in Torres Straits.

Mr. Boulenger read a paper on a large collection of fishes made by Dr. C. Ternitz in the Rio Paraguay.

A communication was read from the Babu Ram Bramha Sányál, giving an account of the moulting of some Birds of Paradise in the Zoological Gardens, Calcutta.

A communication was read from Mr. O. Thomas and Col. J. W. Yerbury, giving a description of a collection of Mammals made by the latter at Aden last winter. It was shown that thirty-six species of Mammals are now known to occur in the Aden district.

A communication was read from Mr. Edwin C. Reed, containing a list of the Hemiptera-Heteroptera of Chili.

Mr. H. Druce read a paper on Bornean Butterflies of the family *Lycanidæ*, in which he had catalogued all the species already recorded from that island, and gave descriptions of a considerable number of new species, principally from Mount Kina-Balu. The number of butterflies of this family previously recorded from Borneo was about 75, and this paper contained references to about 220.

A communication was read from Dr. A. G. Butler, containing an account of a small collection of Butterflies, sent by Mr. R. Crawshay from the country west of Lake Nyasa. Five species were described as new.

Dr. J. Anderson read a paper describing a collection of Reptiles and Batrachians made by Col. Yerbury at Aden and the neighbourhood during the past winter.

Mr. Boulenger gave an account of the Reptiles and Batrachians collected by Dr. A. Donaldson Smith during his recent expedition in Western Somaliland and the Galla country.

This Meeting closed the Session 1894-95.

ENTOMOLOGICAL SOCIETY OF LONDON.

June 5th, 1895.—Lord WALSHINGHAM, F.R.S., Vice-President, in the chair.

Dr. Sharp exhibited, on behalf of Dr. G. D. Haviland, two living species of *Calotermes* from Borneo. Specimens were also exhibited to illustrate the neoteinic forms that were produced in Borneo after a community had been artificially "orphaned." Prof. Riley remarked that in many cases it would be extremely difficult to artificially "orphan" a nest without destroying it; he also commented on the short time in which the queen appeared to have been developed, and on the apparently rapid development of the wing-pads, which usually cannot take place except after several moults; and he expressed his opinion that further information on these points was much to be desired.

Mr. McLachlan exhibited examples of the female of *Pyrrhosoma minium*, Harris, having the abdomen incrustated with whitish mud through ovipositing in a ditch in which the water was nearly all dried up. He had noticed the same thing in other species of *Agrionidæ*.

Herr Jacoby exhibited four varieties of *Smerinthus tiliæ*.

Mr. Enock exhibited specimens of the thistle-gall fly, *Trypeta cardui*, and also of *Caraphractus cinctus*, Haliday (= *Polynema natans*, Lubbock).

M. Alfred Wailly exhibited living larvæ of *Rhodia fugax*, and also a cocoon of a bright green colour, differing considerably in shape from those of all the other known silk-producing Bombyces.

The Secretary exhibited, on behalf of Mr. T. D. A. Cockerell, of Las Cruces, New Mexico, four species of lac-producing *Coccidæ*, viz. *Tachardia gemmifera* from Jamaica, *T. pustulata*, n. s., and *T. fulgens*, n. s., from Arizona, and *T. cornuta* from New Mexico. In the discussion which followed Lord Walsingham mentioned the fact that an American species of Micro-lepidoptera, belonging to the *Æcophoridæ*, feeds on the secretion deposited by one of the *Coccidæ*; this species, for which Dr. Clemens created a genus (the name for which was found to be preoccupied and now stands as *Euclementia*), is the nearest ally to the lost *Æcophora woodiella*, taken many years ago in England.

Mr. Roland Trimen exhibited some specimens of "Honey" Ants, discovered at Estcourt in Natal about a year ago, by Mr. J. M. Hutchinson, all with the abdomen enormously distended with nectar; but other examples presented to the South-African Museum by Mr. Hutchinson comprised various individuals exhibiting different gradations of distention, thus indicating that the condition of absolute repletion is arrived at gradually, and may possibly be reached by some few only of those individuals who feed or are fed up for the purpose. Mr. Trimen remarked that while the occurrence of "Honey" Ants in Southern North America, South Australia, and he believed also in India, was well known, the Natal species now exhibited was the first African one that had come under his notice. Prof. Riley said that the American species referred to by Mr. Trimen was common from Colorado to Mexico, and that the honey-bearing ants were often very numerous in its communities; he further pointed out the fact that many common species of ants have the power of distending the abdomen with honey, and that this was very evident in certain species of *Formica*.

Dr. Sharp exhibited a series of Coleoptera, to illustrate the fact that great variation in size of the individual, or of some of its parts, is very rare in Coleoptera, and is observable most conspicuously in those species in which the males possess unusual structures, the use of which is unknown; such are the *Brenthidæ* and the genus *Rhina*, the males of which possess enormous rostra, which are of no direct use to this sex, though the corresponding organ in the other sex is of great use, although less developed. The *Lucanidæ* and the horned *Lamellicornia* also exhibit great variation in size of the individual, more particularly in the male sex. The cases of variation in size in the great group of *Chrysomelidæ* were chiefly remarkable in genera like *Sagra*, where the males possess unusually developed hind legs, for which at present no important use is known.

Mr. Kirkaldy exhibited specimens of *Cymatia coleoptrata*, Fab., from Morden, Surrey, an insect which had not before been recorded from the London district.—W. W. FOWLER, *Hon. Secretary*.

THE ZOOLOGIST

No. 224.—August, 1895.

OBSERVATIONS ON THE FAUNA OF ST. KILDA.

By J. STEELE ELLIOTT.

THESE notes are written as a further addition to those printed in 'The Zoologist' and 'The Ibis,' principally contributed by Sir W. Milner, Capt. Elwes, and Mr. C. Dixon. They extend over a stay on the island of some three weeks during the early part of June, 1894. Although there are a few items of more than ordinary interest, little in addition could be gleaned from the natives respecting birds seen during the migration and winter periods, owing chiefly to the difficulty of their speaking only Gaelic. Although they have some notion of how to skin any strange species obtained, owing to the want of a gun on the island rarities are seldom secured. The minister of the island cannot be said to render much service to the ornithologist, for he does not profess to know anything beyond what relates to the common breeding species on the islands.

Regarding the Mammalia, the list is certainly a small one; but I feel sure it is nevertheless as complete as it can be made at present.

MAMMALIA.

COMMON MOUSE.—Nine specimens in all were taken, principally young ones, caught at the manse. It seems fairly numerous among the dwellings.

LONG-TAILED FIELD MOUSE.—Unfortunately only one specimen was obtained, trapped near the top of a high stone wall. The coloration of this specimen was very handsome. Instead of the reddish brown fur on the back it was more inclined to grey,

somewhat similar to the young of our type; the fur on the stomach was of a light red shade. Further particulars may be reserved until a series can be obtained for examination and comparison with the typical form of *Mus sylvaticus*.

BIRDS.

PEREGRINE FALCON.—Only one bird was noticed circling above Mullach Osheval. Its eggs were taken from the island of Borrera last year. I am led to believe that it still breeds on the island of Doon and other headlands.

MERLIN.—The Rev. Mr. Fiddies, minister on the island, informed me that this bird occurs frequently. He secured one specimen that flew in at the manse window.

WHITE-TAILED EAGLE.—It is some forty years since this species bred on these islands. It formerly had an eyrie on the Conagher cliffs, whose height reaches some 1260 feet.

THRUSH.—Mr. Fiddies informed me that Thrushes occasionally appear.

BLACKBIRD.—The same remark applies to this species.

WHEATEAR.—Mr. Dixon has mentioned this as a very common bird on St. Kilda. I could only find a few pairs, not more than six. These were located immediately around the village.

SUBALPINE WARBLER.—A specimen of this little warbler was obtained. I first noticed it haunting the minister's garden on June 13th, busily employing itself seeking for food along a row of young peas, and it frequently flew to a parsnip in seed that grew in one corner of the garden; the latter plant seemed to attract a greater number of insects, and it was my particular spot for securing various Diptera, &c. This little bird allowed people to approach quite close to it, and I was able to take full particulars of its plumage within a few feet. It remained throughout Sunday till the following day, when I shot it in the presence of Mr. Fiddies and Mr. McKenzie, the factor. It was at once placed in spirit and forwarded direct to Mr. J. Cullingford, of Durham, for preservation. Its sex could not be ascertained with certainty. It was exhibited to the members of the British Ornithologists' Club in December last by Mr. Bowdler Sharpe. Its presence on the island was probably caused by the great gale that blew across the island the previous day (June 12th) from the S.W. It is remarkable that the species should be first obtained

in the British Islands in such a northern and out-of-the-way locality as St. Kilda.

ST. KILDIAN WREN.—I found it frequenting both Borrera and Doon as well as St. Kilda, and probably Soa, which I did not visit, as the latter island is not far removed from the main island, whereas Borrera lies some five miles away to N.E. Mr. Fiddies informed me that it was once far commoner than it is at present, especially about the village. Its eggs are known to the natives as being well worth securing, always finding a ready sale among the English and other dealers. About fifteen pairs would fully represent their number on these islands now. It rests entirely with collectors whether this bird is to be exterminated, or remain one of the greatest attractions of the island to the ornithologists of the future. The male birds inherit the habit of their mainland representatives by building supernumerary nests for themselves. Besides these unlined nests, I found one containing five eggs quite fresh on June 11th; another with one egg on June 12th, to which other eggs were added, but unfortunately were destroyed; and still another nest I was fortunate to discover, containing four or five young and one addled egg, on June 20th. One of these young I brought away and forwarded to the University Museum, Cambridge, as a most interesting specimen in a valuable stage of its development. The eggs in two of the nests were of the spotted type, very similar in some markings to the ordinary type of the Great Tit. The egg taken from the nest with young is almost white, with a few very fine speckles only upon it. The sites chosen for the nests found were either on the face of the cliffs, more or less hidden by the overhanging grasses and other herbage, or inside among the stonework under the roof of the various "cleits" so numerous all over the island. The materials chosen are according to what is most suitable for the surroundings, and obtainable in this locality.

PIED WAGTAIL.—One appeared close to the manse on June 6th, but was not afterwards observed.

ROCK PIPIT.—A common bird on the islands. Nests were found under the boulders on the hill-side as well as in clefts in the rocks. The Meadow Pipit was not observed, although Sir Wm. Milner has suggested that it breeds there.

TREE SPARROW.—Common. It nests principally in the walls

of the "cleits" about the village. The Common House Sparrow was not observed.

TWITE.—Only one pair of Twites was seen, and I was unable to add this bird to my list as a breeding species.

STARLING.—By far the commonest of the land birds. Several hundreds breed about the islands in the walls of the "cleits" and among the cliffs, and nests were found on the ground under the large boulders, where the birds seemed equally as secure as elsewhere. The song of this bird on the islands is strikingly comparable to that of other species by which it is surrounded, its power of imitation being remarkable.

RAVEN.—Five were noted, probably a pair and young. They were wonderfully tame when I first visited the islands. The nesting site is unknown to the natives.

HOODED CROW.—Numerous and remarkably tame. They would allow me to stand within a few yards of them whilst they hunted over the offal-holes in front of every dwelling.

ROOK.—Mr. Fiddies informed me that hundreds of these birds passed over the islands last winter, great numbers of which perished. Five individuals frequented the island during our stay, the remnant of the above flock. I could not hear of their having nested anywhere.

HOUSE MARTIN.—Mr. J. McKenzie informed me he once obtained a bird of this species on the island.

SWALLOW.—Visits the islands at intervals. Five or six were seen together over the west glen on June 9th, and other odd ones were noticed. To the best of my knowledge it has never nested there.

SWIFT.—Twice seen by Mr. McKenzie, one of which he shot.

ROCK DOVE.—I was unable to find any trace of this bird at all, though it is mentioned as a native by Sir Wm. Milner and Mr. Dixon.

LAPWING.—Mr. Fiddies assured me that this bird is seen every spring on migration.

TURNSTONE.—Mr. G. A. Panton informed me that a specimen in immature plumage was brought to him when he visited these islands in August some years since.

OYSTERCATCHER.—Found breeding commonly on the few low-lying rocks around the island.

WHIMBREL.—Six of these birds were frequenting the East

Bay when we landed, and remained till we departed on June 21st. We could find no trace of any nesting haunt.

DUNLIN.—Although stated to be a breeding species by Gray, I never saw a bird at all, neither do I think the St. Kilda Islands suitable for it as a nesting locality. Mr. McKenzie informed me that he saw one there two years ago.

EIDER DUCK.—About a dozen frequented the E. and W. bays. A nest containing four eggs was found on June 3rd.

RED-BREADED MERGANSER.—One frequented the East Bay on June 11th, but I believe it was only a straggler from the Hebrides, and was not seen again.

GREAT NORTHERN DIVER.—One appeared in the village bay on June 6th.

PUFFIN.—By far the largest colonies of this bird are on Borrera and Soa, where they are said to be on the increase. They have destroyed the greater part of the pasture of these islands by burrowing and killing the grass around, owing to their immense numbers. They also breed in countless thousands on St. Kilda and Doon as well. The factors receive about 200 stone (24 lbs. St. Kildian stone) of feathers from these islands yearly. It takes about 450 Puffins to make a stone of feathers. The feathers of other birds are mixed with them, but Puffins are by far the greatest producers.

RAZORBILL.—The largest colonies noticed of the Razorbill were those at the base of Conacher, and on Doon.

GUILLEMOT.—I cannot agree with Mr. Dixon as to the quantity of eggs taken. I found a creel full—not a boat load—was considered a fair day's work among the men.

BLACK GUILLEMOT.—Rare; the only breeding site noticed was in the chasm between Doon and St. Kilda.

GREAT AUK.—The old grey-haired man, Lachlan McKinnon, mentioned by Mr. Dixon as having taken part in stoning to death a Great Auk in Stack-an-Armin, was, I am sorry to say, dying when I left the island. An interview with him during my stay would have been useless, as I was informed that his memory had left him for some time. The natives told me of a ledge on Soa named after the bird which it is said to have frequented in the breeding season.

GREAT BLACK-BACKED GULL.—Fairly numerous, and breeding in several localities on all the islands.

LESSER BLACK-BACKED GULL.—Although stated to be found here in considerable numbers by previous writers, I failed to distinguish the bird.

HERRING GULL.—Fairly common about the islands. It is the greatest robber of the Gannets and Fulmars eggs.

COMMON GULL.—Sir Wm. Milner states that he procured eggs from Borrera, but I think must have been mistaken, for I never saw a bird of this species there.

KITTIWAKE.—Large colonies exist on all the islands.

BLACK-HEADED GULL.—This bird has been once obtained by Mr. J. McKenzie.

MANX SHEARWATER.—From the number observed flying at night, I should say this bird is far from common, as generally stated. Although the natives value their eggs at a shilling apiece, only one was obtained by them this year.

FULMAR.—I found this bird including small pieces of stone with the scanty supply of grass used as materials for their so-called nest, which in the majority of cases was only a bare hollow without any lining.

FORK-TAILED PETREL.—Although this bird is still fairly plentiful, the Wild Birds Protection Act should in some way extend to these islands for their sake; both the eggs and old birds are always taken by the natives, the latter kept in stockings till the arrival of visitors, when these once beautiful little birds, now starved and mauled, are offered for sale.

STORM PETREL.—Our stay on Borrera was suddenly checked by the weather before we had time to search for this species, said to be numerous there, as also to occur in Doon and Soa.

CORMORANT.—Sir Wm. Milner mentions his having procured eggs of the Cormorant; but this is another bird on the list for which I searched in vain.

SHAG.—Fairly numerous. Besides the various breeding colonies on the cliffs, one colony exists at the base of Conagher, under the large quantity of loose boulders and stones that lie on a very slight incline. This spot is also frequented by Razorbills in large numbers.

GANNET.—When among the immense colony of these birds on Borrera and its two stacks, I was particularly struck with the natives' disregard for bird-life. They think nothing of casting the young, or eggs, if highly incubated, into the sea below them.

ORNITHOLOGICAL NOTES FROM NORWAY.

BY JOHN BENSON, M.A.

REMARKS are frequently heard among visitors to Norway to the effect that they have been surprised to see and hear so few birds there. This may to some extent be explained by the fact that the majority of persons visit that country late in the summer, in July and August, when most birds have young and are therefore comparatively silent, or have already started on their return journey. But let any one walk in the woods, or on the hillsides in the latter half of May, or the first part of June, and he will probably be astonished at the variety of bird-music that he will hear day and night. The Song Thrush, Redwing, Ring Ouzel, Willow Warbler, Tree Pipit, and Wren are indefatigable songsters, and are joined later by the Blackcap and Garden Warbler, while the chorus is swelled by the Redstart, Pied Flycatcher, Brambling, Chaffinch, Yellow Bunting, and Cuckoo.

This year I had the good fortune to be in Norway from the 17th of May to the 6th of July, and though my range of observation was limited, and a good share of my time was devoted to fishing, I met with fifty-eight species of the feathered tribe. This was on the west side of the country between latitudes 60° and 61°, that is, on a level with the Shetlands, some thirty English miles farther north than Bergen, and about fifty miles distant from it as the crow flies. I was staying at Framnaes on the Opheim lake between the Hardanger and Sogne Fjords, but considerably nearer the latter. This lake lies at a thousand feet above sea-level, and is surrounded by mountains, some of which rise another 2000 or 3000 feet, and are cut into by a succession of narrow valleys. These hills up to a certain height are well wooded, chiefly with pine and birch, though the alder is fairly plentiful. Above the level of the woods is a tract of low-growing and stunted junipers, willow-scrub, and dwarf-birches; while on the mountain tops the only vegetation to be found between the snow-patches consists of mosses, lichens, and creeping plants. High up among these hills nestle a number of small tarns, many of which are not clear of ice until the beginning of June, and some not till much later. The Opheim lake itself had had ice upon it till about a week before I arrived. As may be supposed,

there is no lack of water; but this spring was extraordinarily dry, so that the streams were very empty, and much of the boggy ground on the hills was boggy no longer. To come to the birds themselves.

The Thrushes were represented by the Song Thrush (*Turdus musicus*), Fieldfare (*T. pilaris*), Redwing (*T. iliacus*), and the Ring Ouzel (*T. torquatus*), but I observed neither the Mistle Thrush (*T. viscivorus*) nor Blackbird (*T. merula*). The Fieldfares generally breed in colonies, often consisting of a large number of pairs, and offering much to interest a lover of birds. The approach of a suspicious character, be it in the form of man, beast, or bird, is proclaimed by a great outcry among the colonists, whose note of alarm is not very unlike the sound made by a policeman's rattle. The general clamour and excitement does not fall far short of that caused by an intrusion into a rookery. Unlike Rooks, however, more than one pair of Fieldfares never occupies the same tree. The nests are placed with little or no attempt at concealment, which indeed is a matter of some difficulty at the season when they commence to build, before the birches are in leaf. The commonest position is the fork which a branch of a tree makes with the stem; but many other situations are chosen, and those at all heights above the ground, though I have never found one actually on the ground, as is often the case with the Redwing. A low shrub of juniper is not an unusual position. The materials usually employed are grass and mud, with a lining of finer grasses; but I found a nest, the exterior of which was thickly covered with the white feathers of the Ryper, making it very conspicuous. The bird does not sit very close, generally flying off when her particular tree is approached, and joining in the chorus of maledictions.

But it is not on account of the Fieldfares alone that such a colony is interesting—it is so also because many small birds are in the habit of breeding in its vicinity; in which they show their wisdom, for they would not easily find more watchful sentinels or pluckier champions. This applies especially to the Brambling, and I do not think I visited a colony without seeing or hearing one or a pair of those handsome birds near at hand. The chief persecutors of the Fieldfares are the Hooded Crows, who, in spite of the attempts of the parent birds to scare them away, contrive to carry off a large proportion of the unfledged young. In one

case I knew of nests both of the Hooded Crow and the Hobby in trees close to a colony of Fieldfares, and it was interesting to watch the Hawks aiding the smaller birds to drive away the Crows. I found eggs of the Fieldfare in an advanced stage of incubation on May 19th, young just hatched on the 22nd, and on the 3rd of June I caught a young one which had just left the nest.

The Redwing is fond of building its nest on the outskirts of a Fieldfare colony, generally near, if not on the ground, and with more attempt at concealment. It is altogether a much less obtrusive bird, unless its nest is interfered with, when it becomes very bold, making swoops at the invader, and snapping its beak the while. The song is sweet, though somewhat plaintive. The nest is formed of sticks, mud, and grass, the lining being of the last-named. I found eggs on the 22nd of May.

The Wheatear (*Saxicola œnanthe*) was plentiful; the Whinchat (*Pratincola rubetra*) less so; while I observed the Redstart (*Ruticilla phœnicurus*) and Redbreast (*Erythacus rubecula*) only in the woods, and not near human habitations.

Of the Warblers the Willow Wren (*Phylloscopus trochilus*) was ubiquitous as high as the tree-growth extends. The Blackcap (*Sylvia atricapilla*) and Garden Warbler (*S. hortensis*) were about equally distributed. The Whitethroat (*S. cinerea*) I only observed once, and the Golden-crested Wren (*Regulus cristatus*) did not occur very commonly.

The Hedge Accentor (*Accentor modularis*) was met with occasionally, but seemed more retiring than in this country.

The Dipper (*Cinclus aquaticus*) might be seen by every stream.

The family of Paridæ was well represented by the Great, Blue, Coal, Marsh, and Long-tailed Tits (*Parus maior*, *P. cæruleus*, *P. ater*, *P. palustris*, and *Acredula caudata*), but I did not meet with the Crested Tit (*P. cristatus*). None of these species, however, appeared particularly abundant, the commonest being perhaps the Marsh and Long-tailed Tits—the latter with very white heads. A nest I found of this species was curious from the fact of its having two holes, one at the top and the other just below it.

The Wren (*Troglodytes parvulus*) and Tree Creeper (*Certhia familiaris*) were both fairly common.

The White Wagtail (*Motacilla alba*) was the only one of its family I saw, and was most abundant, nesting among the loose

stone-work of the farm-buildings and sæters. One nest I found under a stump in the bank of a ditch by the side of a road, apparently the entrance to an old mouse-hole. Incubation had commenced on May 27th.

The Tree Pipit (*Anthus trivialis*) was abundant, more so perhaps than the Meadow Pipit (*A. pratensis*).

One of the commonest birds was the Pied Flycatcher (*Muscicapa atricapilla*). Near dwellings and in the woods its song, such as it is, was to be heard day and night from the middle of May to the end of June; for this confiding and energetic little bird seems to do with very little sleep during the lovely Norwegian summer nights. On May 20th a nest was in the course of building, and I found eggs on the 30th. A favourite site is in the rotten stump of a birch, which has been broken off some six or seven feet from the ground, and is devoid of bark. Here the birds apparently excavate a hole for themselves, as the entrances were for the most part newly made, and chips were lying on the ground. It was remarkable in how many places a hole had been commenced, and then for some reason forsaken, perhaps because the bird had struck wood that was too hard. I have seen a stump with four such beginnings besides the actual nest-hole. It is, however, as often found building in old holes, and sometimes in extraordinary positions. One pair built in a stack of firewood in a shed, the only entrance to which was through a chink above the door, and it was curious to see the bird literally squeeze itself through this crack. Unfortunately the nest was disturbed, or it would have been interesting to see how the young were brought out. During the time of incubation the male sits on the roof, or tree-top, and practises its rather monotonous song, occasionally making a descent upon some insect on the ground. The female sits very close, and may often be removed from the nest with the hand.

The Spotted Flycatcher (*M. grisola*) is by no means so common.

I observed a Swallow (*Hirundo rustica*) first on May 25th, and Martins (*Chelidon urbica*) on the 27th.

Of the Finches, the commonest was the Brambling (*Fringilla montifringilla*). As I have said, there was hardly a colony of Fieldfares but had a pair of these birds as neighbours, though I never found the Finches breeding in company; in fact, I

never saw more than one pair at a time. Its harsh long-drawn note, something like that of the Greenfinch, which is so often repeated, is in strange contrast to the lively Canary-like chirp of alarm when the nest is approached. The former is uttered by the male when feeding or passing from tree to tree, but he has also a song consisting of a few clear-whistled and somewhat sad notes. The nest much resembles that of the Chaffinch, but is larger. Moss, wool, lichen, grass, and fine shreds of bark are all employed, while the lining consists of feathers, hair, and down. I found it usually placed close to the trunk of a small birch. Eggs were hard-set on May 27th, and in another case the young had left the nest on June 12th.

The Chaffinch (*F. cœlebs*) was far less common than its congener, though not rare. The Siskin (*Chrysomitris spinus*) and Mealy Redpoll (*A. linaria*) were less often to be met with. A nest of the latter, which in the afternoon of May 22nd was only half-built, was beautifully lined with feathers of the Ryper (how these small birds must bless the Ryper!) and contained five eggs on the 27th. The Twite (*A. flavirostris*) was abundant on all the fells. The House Sparrow (*P. domesticus*), in small numbers, frequented most of the villages.

The Yellow Bunting (*Emberiza citrinella*) occurred commonly, and the Reed Bunting (*E. schœniclus*) in suitable localities.

The Starling (*Sturnus vulgaris*) was not often seen.

Owing to its seldom being molested the Magpie (*Pica rustica*) is astonishingly bold, when compared with the shy and wary British bird. It breeds by preference near to dwellings, and frequently places its nest under the gable, or any other part of the roof where it can find support for the bulky structure.

The only other member of the *Corvidæ* was that most ruthless of robbers, the Hooded Crow (*Corvus cornix*), which was abundant.

Only in one instance did I observe a Swift (*Cypselus apus*). The Wryneck (*Jynx torquilla*) was fairly often heard and seen.

I was disappointed in only meeting with the Green Woodpecker (*Gecinus viridis*), as in former years, though later in the season I had seen both the Great and Lesser Spotted birds.

The earliest date on which I heard the Cuckoo (*Cuculus canorus*) was May 27th, after which it was to be heard night and day in wood and on fell. As in this country, so among

Norwegian peasants it is a popular belief that the Cuckoo turns into a Hawk in the autumn.

I met with none of the Owls, but found the breast-feathers of the Eagle Owl (*Bubo ignavus*) upon some juniper bushes on one of the mountains.

The Hobby (*Falco subbuteo*) and the Kestrel (*F. tinnunculus*) I found breeding, and these were the only two species of the Hawk tribe I observed.

On my arrival (May 18th) I was shown a Goldeneye (*Clangula glaucion*), which had been shot the day before on the lake near the hotel; and for several days after I observed three birds of this species on the water, after which they disappeared.

On June 7th, during a walk over the mountains, I came to a tarn some 3000 ft. above sea-level, on which were a pair of Long-tailed Ducks (*Harelda glacialis*), and five Scaups (*Fuligula marila*), with their mates. As the water was only just clear of ice, these probably had only lately arrived. There was a small island in the tarn, which was evidently their breeding-place.

The same day I watched a pair of Fjeld-ryper or Ptarmigan (*Lagopus mutus*) upon the snow. In the higher parts of the valleys the Li-ryper or Willow Grouse (*L. lagopus*) was abundant. Young of this species were hatching on June 16th. I occasionally saw and heard the Black Grouse (*Tetrao tetrix*).

Of the Waders, the Woodcock (*Scolopax rusticula*), Common Sandpiper (*Tringa hypoleucus*), Redshank (*Totanus calidris*), and the Curlew (*Numenius arquata*) were the only representatives seen.

A pair of Common Gulls (*Larus canus*) were breeding on the island in the tarn with the ducks.

Two Black-throated Divers (*Colymbus arcticus*) came regularly every evening to the Opheim lake to feed, but I could not discover whence they came, nor whither they went.

I only saw one live Lemming, but as 1894 was a "Lemming year," skins of this little animal were lying everywhere. Last winter, I was told, Hares were very plentiful. I saw several which were changing their winter for their summer coats.

ON THE HABITS OF THE KEA, OR MOUNTAIN
PARROT OF NEW ZEALAND.

BY TAYLOR WHITE.*

I HAVE been prompted to write this paper on receipt of a letter from Dr. Alfred R. Wallace, F.R.S., who still holds to the old-time stories given of this bird long ago, and follows the lead of those who had but a second-hand knowledge of this bird, and so falls into errors, such as its leaving the berries of the forest-trees and taking to picking the kidney-fat out of live sheep running on the mountain-side, and being gradually trained thereto by commencing to sample the carcasses of sheep hanging on the gallows or slaughter-place of the sheep-farmer. I am merely quoting from memory, and so am liable to vary the exact words. But I remember being astonished on reading of the Kea living in the forest, for I never even during the severest winters saw it perched on a tree, and, further, the small patches of trees in the alpine valleys are all of one kind, a species of *Fagus*, which were called by the settlers black-birch. The fruit or "beech mast" of these trees is very minute and rare, and of little, if any, service to the birds of other species.

I have during hard winters tamed the Kaka (*Nestor meridionalis*), which in a starved condition might settle on the house, when I would approach with a piece of raw meat on the point of a long stick, like a fishing-rod, but never a Kea, *Nestor notabilis*; and the only birds I remember picking at the carcasses of sheep on the gallows were flocks of the newly-arrived bird, the small White-eye, *Zosterops*, which came to New Zealand about the year 1860, as well as I can fix the date.

The berries on the ranges, or mountain-side, were few and of little food-value, the chief in point of size being the snowberry, but it was seldom seen. My opinion is that the Kea lived mainly on the lichen growing on the rocks, and on grubs when obtainable. The lichen would, in places where the rocks were steep, be free from a covering of snow when all else was snowed up to a depth of three feet or more.

The Kea always lived high up the mountains a long distance

* From the 'Transactions' of the New Zealand Institute, vol. xxvii., pp. 273—280, May, 1895. See Potts, 'Zoologist,' 1881, pp. 290—301.

above the forest-line, for you must understand that on a mountain-side each variety of tree has its limit of elevation. The mixed bush grows on the plain; and a short distance above, where these trees, as rimu, white-pine, black-pine, &c., are at their highest, and cease to grow, come the different kinds of *Fagus*, of which the so-called black-birch attains the highest elevation. On glancing along the alpine hills, such as, for instance, those on either shore of Lake Wakatipu, you will see with surprise that the dark-green of the trees reaches so far up the mountain-side, and is then cut off level and clean as far as the eyesight can extend into the far distance. Above this level line of dark forest comes the brown straw-colour of the mountain grass, which in turn gives way to the slate-grey or yellow-grey of the rocky summits and their *débris* of broken stones.

On this same forest limit grows also the tall bracken fern, so the dark-green of the forest would be at places for a considerable extent varied by the brighter green of the fern. But both forest and fern attained the same elevations, and so the long line of green was only changed in shade of colour, and did not encroach upon the area of the yellow grasses.* The Kea lived above this forest limit, and was mostly seen moving about the rocks and boulders on the ridge of the mountain-tops. The name "Kea" would seem to be an imitation of a frequent call of this bird. But it also makes a number of other sounds. About the first I can remember of this bird was at a time when I resided near the head-waters of the Oreti or New River. One hot day—it probably was in the summer-time—when walking across the valley between the mountains, my attention was attracted by a remarkable sound or series of cries. These I mistook for the noise of several small puppies of the Wild Dog, crying from hunger in the nest. I at once set to work to climb up the steep mountain-side to capture these creatures; but the result was not as was expected, but a dull-green-coloured bird was found seated on a projecting piece of rock. These birds are coloured green, shaded with black, and have bright orange-red feathers of small size on the under side of their wings. They are about the size of a Kaka, rather narrower across the back, and have the hooked point of the upper mandible somewhat longer. Their feet are of

* This description is of scenery viewed some thirty years ago.

the true parrot form, or, as a sailor would say, have the toes placed "fore and aft."

On first becoming acquainted with man they showed little sign of fear. In fact, I have, when on the mountain-top, remained standing perfectly still, with Keas hopping round me, but would have ultimately to drive them away, for one would come to inspect the brass eyelets in my boots, and try to pick them out, when, seeing that the boot-laces would quickly be cut through, I would require to stop this performance. One day a shepherd brought home a live Kea which he caught by placing his open hand on the ground when he was lying down; this bird calmly stepped on to his hand, and was captured. On bringing the bird home he placed it in a room in a stone building to await my coming. The result was that the small wooden bars of the window were cut away by its powerful beak down level with the panes of glass. A ring and small chain were afterwards fastened to its leg, and it was tethered on the lawn, having a small box placed near as a shelter. Here it lived several years, but one day was missing, taking the chain with it. The shelter-box was soon a sight to see, for the bird drilled large round holes through it in several places, and his great delight appeared to be in carpentry work. He was fed on scraps of bread and meat, and would amuse himself by throwing his drinking-vessel away, regardless of after consequences. Under the name of Sancho he was regarded as a member of our family party, but never gave any sign of newly-acquired habits under domestication, or showed signs of affection to those who cared for him.

About the year 1861 we first took sheep into this country, previously having stocked with cattle. The sheep increased and multiplied, and did remarkably well, notwithstanding the heavy snowfalls on the higher lands. After a number of years, when sheep were mustered in from the back ranges, it was noticed that several would die in the yards during the night, for they would require to be kept in for^rdrafting on the following day. These dead sheep would be mostly sheep which had missed a shearing, and were double-fleeced, having very long wool. On taking the skin from these sheep a small hole, not previously seen, would be found over the shoulder-blades, or in the small of the back, over the kidneys. We were quite incapable of understanding the cause of these wounds, but considered that these sheep would

not have died from the wound if it had not been for the heating they received from the drive of the muster. One day my brother John came home and said that he now knew what caused the holes in the back of the sheep; it was done by the Kea. This surprised me greatly, but I soon afterwards had evidence of the fact myself, for when some of these birds had once found out that the blood of the sheep was good for food, others were soon initiated into the performance. It was seen that the sheep (merinoes) with the longest wool were those which chiefly suffered, from which I concluded that the length of wool gave the bird better facilities for holding on with his feet during the time occupied in drilling a hole into the unfortunate sheep, which would at first run madly about with the bird fixed to its back. Those sheep which were penned in by a recent fall of snow would be an easy prey.

A person living in this district brought some fifteen hundred crossbred cheviot and merino, and wintered them on these hills, but the extra length of wool on these sheep caused them to be specially attacked by the Kea, and on mustering in the spring very few of this flock were found alive. Mr. W. M. Hodgkins, of Dunedin, obtained for me two brace of old-fashioned horse-pistols, which we would take with us when shepherding, loading with shot, and so peppering the Keas; for to carry a gun was a heavy load when climbing about. The birds soon found out that we were enemies, and, in place of a friendly interview, were mostly seen flying about, screaming, far away on the opposite range. It became quite a rare thing to get within shooting-distance of these treacherous birds, and all our friendly interest in them was turned to murderous thoughts. I do not think they went specially for the kidney-fat of the sheep, or had any particular choice, but that that point was chiefly selected owing to the bird having a better hold when in that position. They would nest in the crevices of the rocks, but I never was able to take either eggs or young birds, the fissures being too deep and narrow to admit of approach.

Dr. Wallace asks me, Did the Kea mistake the live sheep for the vegetable sheep—a peculiar growth of lichen? I would say not, for I have never to my knowledge seen a vegetable sheep, or mistaken such for a living one, as the story goes. Therefore my particular Keas were not likely to see this vegetable substance

either; and I never knew the bird to be seen feeding on a dead sheep. The sheep always died after the repast, and were then left to the Wekas (*Ocydromus australis*) and Buzzard Hawks, who would finish the work of destruction.

About the time at which we found out that the Kea molested the sheep, we read in the papers that the shepherds on the Wanaka Station, some thirty or forty miles in a northerly direction from our position, had also discovered the same fact, and this made the authorities of the Dunedin Museum very desirous to obtain a specimen of this bird. My brother John saved the skin of one and presented it to the Museum, and this was the first specimen seen there. I can suggest no reason for the Kea acquiring this new habit other than that the sheep, in winter-time, which were snowed in on the shady side of the range, would have a coating of snow or frost, and sometimes had long icicles hanging to their wool, so much so that the discoloured snow-tracks of the sheep would be more readily seen by the shepherd than the sheep themselves, and from this disguise of the sheep they might be more readily enquired into by the Kea, who might mistake the frozen wool for a snow-covered piece of rock; but on the other hand, the bird did not attempt to pluck the wool from the whole length of the sheep's back, as if in search of buried insects, but confined its operations to the one small area, either behind the shoulders, or over the kidneys. Nor did the bird specially desire kidney-fat, which it seldom reached. It was the position and hold of the bird which determined the point of attack, for probably if the bird had seated itself on the head or rump of the animal it would have been successfully driven away. A sheep would have great difficulty to turn its head or neck sufficiently backward to dislodge anything seated on its back immediately behind the shoulders. I would say that blood rather than flesh was what the bird desired, for, as said previously, no carcass was ever eaten, though the birds might be flying round in scores. The dead bodies, if touched at all, were eaten by the Weka, the Hawk, and the Rat. I have known the Rat to nibble the tender hoofs from the living new-born lamb; after a time, if the lamb survived, the hoof would grow down as would a person's finger-nail, and so the damage would be rectified. My knowledge of the Kea has no reference to its habits at the present time, for I have for twenty years lived in a district where

they are not to be found. As my excuse for writing this I append a copy of that portion of Dr. Wallace's letter which induced me to think it desirable that the habits of the Kea should be remarked upon:—

Parkstone, Dorset, 3rd January, 1894.

DEAR SIR,—I received from a friend of yours a number of the 'Journal of Science,' containing among other things some remarks on the habits of the Kea. As the writer says that I have given "what is generally believed to be a correct description of the bird's habits, &c.," it will be time enough to change it when other New Zealand authorities accept Mr. Huddleston's account. I see in another article it is stated that the habit of tearing open the vegetable sheep for insects led to the Kea's tearing open first dead sheep and then living ones. . . .—Yours very faithfully, ALFRED R. WALLACE.—Taylor White, Esq.

To this I reply that Mr. Huddleston's article on the Kea is the best I have seen on the subject, and, so far as my own experience goes, is reliable, and for this reason I specially obtained that number of the 'Journal of Science' which contained Mr. Huddleston's paper, and forwarded it to Dr. Wallace; hence his letter to me thereon.

It must be remembered that this bird, having for its habitat the tops of alpine ranges, is seen by few other than shepherds and owners of sheep who are hardy enough to head the sheep-mustering parties, and whose business it is to search the rocky mountain-tops in summer for sheep requiring to be shorn or docked, and in winter, about the end of June, to collect, extricate, and drive downward sheep from the then heavily snow-clad summits. An account of this latter dangerous work I gave in a back volume of 'Transactions.' Such are the men who can give the life-history of the Kea, and of these I claim to have been one. But such doings are now a matter of retrospection.

Since writing the above I have been able to place my hand on Mr. F. F. C. Huddleston's paper. The passage in "Darwinism" to which he takes exception is the following:—"It [the Kea] belongs to the family of Brush-tongued Parrots, and naturally feeds on the honey of flowers, and the insects which frequent them, together with such fruits or berries as are found in the region. Till quite recently this composed its whole diet, but since the country it inhabits has been occupied by Europeans, it has developed a taste for a carnivorous diet, with alarming

results. It began by picking the sheepskins hung out to dry, or the meat in the process of being cured. About 1868 it was first observed to attack living sheep, which had frequently been found with raw and bleeding wounds on their backs. Since then it is stated that the bird actually burrows into the living sheep, eating its way down to the kidneys, which form its special delicacy."

Mr. Huddleston says:—

"The reason, I believe, that the bird has been charged with eating the kidney of the sheep it attacks is that the loin or rump of the sheep is the broadest part whereon it can get an easy grip. As the sheep feels its assailant it runs away, with the bird holding on and naturally having its beak over the kidneys, where it sets to work. . . . I have found large numbers of sheep with only a very small hole in the back, about the size of a crown, which being examined showed a cavity beneath as large as a man's hand, in which the backbone and ribs were perfectly bare. Others I found with holes in the side through which the intestines had been drawn, the sheep being still alive, and in some instances the wound had healed and apparently formed a false anus." An instance of a wound healing as described I have witnessed myself—an opening in the flank.—T. W.

"Besides grubs, as the Weta (*Deinacrida*) and the Cicada, they feed on the berries of various alpine shrubs and trees [? T. W.], such as the snowberry (*Gaultheria*), *Coprosma*, *Panax*, and the little black seed in a white skin of the *Phyllocladus alpinus*; the *Pittosporum*, with its hard seed in a glutinous mass like birdlime; and the red berry of the *Podocarpus*; also, in winter, on the roots of the various herbaceous alpine plants—*Aciphylla squarrosa* and *colensoi*, *Ranunculus lyallii*, *Celmisias*, &c.

"About Mount Cook they breed very early in the year, as I have found their nests in August, when snow was on the ground. The first time that I saw nests at that time of the year was when I was shooting, at an altitude of 3000 ft. I shot a bird that was sitting on a rock. After it fell another appeared on the rock, and from the same place I shot twenty-two. I went to pick up the dead birds, and then found that they had, in the first place, all come out of a hole under the rock. On looking into the hole I saw something moving, which eventually turned out to be young birds. They were out of reach, but after some trouble I managed

to noose one, and found that it was in its nesting plumage of slate-coloured down, with very yellow beak and legs. There were others in different stages of growth, also eggs. I have since found other nests, and have noticed that after a time the old birds leave the half-grown ones to hatch out the late eggs, all the community doing their share of feeding the young. The same habit I have noticed in the native Parrakeet. The Kea's egg is white, and about the size of a Pigeon's, but rounder, and with a rough shell [cf. Zool. 1883, p. 376]. The young birds do not come out of the nest until fully fledged and able to fly. The young birds are so tame that if a person comes across a flock of them and keeps perfectly still they will walk up to him and pull his clothes.

“I am unable to give a correct estimate of the number killed in the Mount Cook and Lake Wakatipu districts. The slaughter of them at times has been very great. At Lake Wanaka, in four years, I myself killed over three thousand, and I know of several up-country stations where one to two hundred were killed yearly. To reduce their numbers the County Councils used to give from 1s. to 2s. per beak, and the Government then gave the Councils a subsidy of pound for pound. This has now been discontinued, and so gives a chance of increase.”*

As quoted above, Mr. Huddleston speaks of the Kea eating the berries of various alpine shrubs and trees, among others *Panax* and *Pittosporum*; these are only the taller undergrowth of the forest, or at times a few may be found in a warm gully alongside a small creek. They are all tall shrubs, and I have never seen them growing at the elevation frequented by the Kea, but I have no knowledge of the vegetation about Mount Cook. *Podocarpus* is the generic name of several forest-trees, as the black pine and totara, and these grow in what are termed the mixed bushes of the lowlands. I once found on the mountain side, growing among and covering a large area of large angular fragments of broken rocks, a peculiar prostrate shrub, and, after some search, found the seed or berry of this carpet-like growth. My sister made a coloured sketch of the small branch which I brought home. This I sent to Dr. Black, of Dunedin. He replied that he did not recognise it, and had handed the drawing to the care of the local museum. At that time I had never seen the totara

* ‘New Zealand Journal of Science,’ September, 1891.

tree of the forest (*Podocarpus totara*), but, on seeing a twig and fruit of this tree, I at once saw that my prostrate shrub was a variety of the totara. I hardly think Mr. Huddleston alludes to this variety of *Podocarpus*, and should be surprised to hear that the Kea really has access to the fruit of any of the forest *Podocarpus*.

In this same journal Mr. F. R. Chapman, in describing a botanical expedition which he made to a valley of the Upper Waimakariri, Canterbury, says:—"A very interesting *Raoulia*, or vegetable sheep, was very plentiful on steep rocky places, but I believe a finer species is found on Mount Torlesse. . . . It is said that the Keas tear them up with their powerful beaks, and that these birds learnt to eat mutton through mistaking dead sheep for masses of *Raoulia*."

Mr. Huddleston has, to my thinking made a hasty guess as to Keas' bill-of-fare including, *Coprosma*, *Panax*, *Pittosporum*, and *Podocarpus*. Also, I would ask, how could the bird feed in winter on the roots of *Aciphylla*, *Ranunculus*, or *Celmisia*, which would then be covered with a deep winding-sheet of snow 3 ft. to 10 ft. in thickness?

NOTES AND QUERIES.

MAMMALIA.

Marten in Cumberland.—I have recently received a specimen of the Marten, which was trapped near Derwent Water on Dec. 23rd last. The animal is a male, and weighed $2\frac{1}{2}$ lbs. The orange-white patch on the throat and breast is very conspicuous, and well set off by the dark colour of the rest of the body.—E. W. H. BLAGG (Cheadle, Staffordshire).

[During a recent visit to Christchurch, Hants, we noticed in the admirable collection of Mr. Hart two mounted specimens of the Pine Marten, both of which were obtained in Cumberland, one a male taken at Wallae Crag on Nov. 28th, 1891; the other a female taken near Keswick so lately as Feb. 16th, 1895.—ED.]

Marten in Co. Waterford.—Irish naturalists have to thank the Editor for his article on "The Marten in Ireland" (Zool. 1894, p. 100). From this source of information it would appear that *Martes sylvatica* has not been noticed in the Co. Waterford for about forty-five years. Six specimens, according to Mr. Ussher, were taken about the year 1850 in different parts

of the county. I have now to record the capture in June last of two specimens, male and female. The female was taken on the 6th June, the male on the 7th. I am indebted to Mr. James Gordon, head gamekeeper of the Marquis of Waterford, for the following information. They were taken in rabbit-traps which were set in a large burrow. The female measured $27\frac{3}{4}$ inches in length, and was much more slender in appearance than the male. On examination she was found to be suckling young. The male was caught in the same burrow: length $30\frac{1}{2}$ inches, very much stouter than the female. Mr. Gordon is inclined to think that the young were in the burrow. He has skinned both specimens, and mounted them very fairly. He says they were quite free from any disagreeable smell. The spots on the chest of both are yellow. One curious thing I noticed about these spots in both specimens was that on the right side the line is very irregular. I suppose this is only a peculiarity of these particular specimens.—WILLIAM W. FLEMYNG (Coolfin, Portlaw, Co. Waterford).

Albino Weasels.—As the white form of this little animal appears to be somewhat rare, I may state that, besides the one already recorded by me (Zool. 1889, p. 449), I have had the pleasure of inspecting two others, one caught in a trap in January last, and another killed on the 3rd or 4th of July last. The January specimen was a male weighing $5\frac{3}{4}$ oz. and measuring $10\frac{1}{2}$ in. in length, of which the tail was $2\frac{1}{4}$ in.; its body was of considerable bulk, which may be inferred from the above weight when compared with the measurements. The specimen taken in July weighed only 2 oz. and was only 9 inches long including the tail, which was 2 in. This was a female, and in appearance the sleekest little creature I ever saw, for its snake-like body was hardly thicker than one's finger, and the tiny limbs seemed the perfection of symmetry and form, indicating extreme activity when alive, to which its needle-like teeth must have been a useful adjunct. There was a peculiarity about the tail, caused I suppose by some accident: the middle portion for about half-an-inch in length was almost bare of hair, but the tip ended in quite a tuft, which looked rather curious. Both specimens were pure white, with pink eyes; the ears, nose, lips, and toes pale flesh-colour. The three specimens I have seen were all taken within a radius of ten miles, but not very near each other. With regard to the colour of the ordinary Weasel, I have sometimes seen specimens in which the white under parts were much dappled with the colour of the back, but in more than twenty years' experience I do not recollect ever seeing one with any indication of a black tip to the tail.—G. B. CORBIN (Ringwood).

Bank Vole in Anglesea.—In the second week of July I trapped an adult female of this species in a roadside hedge at Cemmaes, on the north coast of Anglesea. The animal lacked the rich chestnut fur which characterises the Bank Voles here in Cheshire, and in the colour of its upper

parts closely resembled a common Short-tailed Field Vole. The length of its tail, its prominent ears, white under parts, and above all the characters of its grinding teeth, were, however, sufficient to establish its identity.—CHARLES OLDHAM (Romiley).

[The Bank Vole being absent from Ireland, it is extremely interesting to have thus established the precise limit of its range westward.—ED.]

BIRDS.

The Imitative Faculty in Birds.—Last November a live Tree Sparrow, *Passer montanus*, was brought to me which had been taken in one of the “clap-nets” so lamentably common and so destructive in this locality during the winter. It has been kept in a cage in proximity to a hybrid Canary and Goldfinch, and since April (up to which time it appeared to be vocally silent) I have often remarked the accuracy with which it reproduces the notes—and, more rarely, a longer or shorter fragment of the song—of its companion. Its own song possesses qualities distinctly pleasing but scarcely comparable to the brilliant effervescence it counterfeits in the more gifted hybrid. Latterly the imitations have been more varied and skilful than were the first attempts; and this is certainly a noteworthy feature, indicating as it does that the mimical faculty is capable of considerable development. Montagu mentioned (Orn. Dict. 1802, art. “Song of Birds”)—and, indeed, Aristotle speculated in effect on the same subject long before—that birds when confined learn the songs of those they most frequently hear; but, as is now well known, many species in the reverse condition are given to mimicking their fellows. As an instance of the latter case I may mention that my father, Mr. E. P. P. Butterfield, has recorded (Zool. 1877, p. 384) his having heard a Whinchat, a bird of no extensive vocal capability, imitate “in quick succession the song of the Wren, Song Thrush, Chaffinch, Corn Bunting, Tree Pipit, Greenfinch, and Starling.” Similar instances will occur to all who have any experience of field ornithology—it is notorious that the faculty obtains amongst members of the genus *Acrocephalus*. I cannot wholly agree with the writer of an ingenious theory in ‘The Zoologist’ (1890, p. 233 *et seq.*) who supposes birds’ songs to have originated in the imitation of constantly recurring sounds connected with their food or surroundings. If the song of a species varies dialectically in different areas of its geographical range—and that such is the case would appear to be well established—there can be no reason biologically why the different “dialects” may not ultimately depart as variantly from what may be considered the typical specific song as do the songs of allied species. In our present state of knowledge it behoves us to hazard a conjecture regarding the origin of song with the utmost caution. For myself I incline to think that Mr. Darwin was right in giving prominence to sexual selection as accounting both for the origin

and development of song, although perhaps the influence of the emotions (as of joy, hostility, &c.) has in no small degree contributed to the development. Many writers regard song as the expression of "superabundant nervous energy" (in the words of a distinguished naturalist), but it cannot, I think, be maintained that the most active birds are the greatest songsters. The subject in all its phases is worthy of the attention of zoologists.—
W. C. J. RUSKIN BUTTERFIELD (Stanhope Place, St. Leonards-on-Sea).

Date of Arrival in England of the Marsh Warbler.—The following dates may throw some light on this point, about which our text-books are somewhat vague:—

- June 5, 1892. Full song; no sign of nest. (Oxfordshire, W. W. F.)
- June 20, 1893. Full song; nest well advanced. Egg, 25th. (Oxfordshire, W. W. F.)
- June 19, 1894. Nest with two eggs. (Near Bristol, H. C. Playne.)
- June 16, 1894. Full song; nest not discovered. (Oxfordshire, W. W. F.)
- June 6, 1895. Full song; no sign of nest or female. (Bristol, H. C. P.)
- June 11, 1895. Song; no sign of nest. (Oxfordshire, W. W. F.)

These dates accord fairly well with those which I can find given exactly in former volumes of 'The Zoologist.' Thus in Zool. 1877, p. 334, we have eggs on June 22; 1882, p. 306, eggs June 30; 1883, p. 295, eggs June 7; 1889, p. 451, eggs June 5. Hence it would seem that this species must reach us about the middle of May; but, so far as my experience goes, it does not arrive at its usual breeding ground much before June. In fact, I have never yet succeeded in detecting its song earlier than June 5th, and then it did not remain long in the spot where I first heard it. It is said by Prof. Giglioli to arrive in Italy in April; and Herr Gätke tells us that it appears in Heligoland about the beginning of May. But when I was in Switzerland, at the end of April last, it was not in its accustomed haunts; and the reason was obvious—the plants in which it loves to breed were not yet grown up. It is apparently a species which is very particular about the kind of covert which it affects for breeding purposes, especially in this country, where it has almost always been found in withy-beds; and, until this covert is ready for it, it will not make itself obvious to eye or ear. I think it probable that the date of its breeding will be found to vary from the beginning to the end of June, according to the state of the undergrowth in withy-beds in different seasons; but in all probability the birds—*i. e.* the males—arrive pretty regularly in May.—W. WARDE FOWLER (Oxford).

Nesting of the Marsh Warbler near Bath.—It may be of interest to note that on June 20th last I had the good fortune to discover a nest of the Marsh Warbler, *Acrocephalus palustris*, in an osier-bed near Bath. Mr. Hall and Mr. Playue, of Clifton College, both of whom are well acquainted with the species, immediately identified the nest as that of the Marsh

Warbler. The nest, which contained four typical eggs, was situated within a few yards of the spot where Mr. Playne found a nest of the Marsh Warbler last year (cf. Zool. 1894, p. 304); it was about 18 inches from the ground, and very similar to last year's nest, except that it was suspended entirely from the stalks of meadowsweet, without the help of osier-stems. We were not so fortunate in observing the bird this year as we were last, when on two occasions we heard the male give an admirable display of his mimicking powers: but, apart from that, there are certain passages in his song which at once distinguish him from the Reed Warbler, the species which he most closely resembles. I visited the nest again on June 29th, expecting to find the young hatched, but found instead that the nest had been ruthlessly destroyed; the birds, however, were still in the neighbourhood, so it is to be hoped that they will build a second nest, which will escape detection in the thick meadowsweet.—A. F. R. WOLLASTON (King's College, Cambridge).

Grasshopper Warbler in North Wales.—From the notes contributed by Messrs. Rawling and Salter on the birds of Wales, it appears that the Grasshopper Warbler is a somewhat local species in the principality, and it may be worth while to record its occurrence in Carmarthenshire and Anglesea. In the former county Mr. T. A. Coward and I heard a bird "reeling" on a hillside covered with brushwood between Pwllheli and Abersoch, in June, 1887, and again in May, 1888 and 1893. In May, 1895, I heard a bird of this species in this spot, and a second in a snipe marsh about a mile west of Abersoch village. In Anglesea Mr. E. W. H. Blagg and I watched a female Grasshopper Warbler sneaking through the grass on some waste land near Ty-croes station, in June, 1891. In July of the present year I heard others "reeling" in three different places in the neighbourhood of Cemmaes and Llanfechell, on the north coast of the island.—CHARLES OLDHAM (Romiley).

Cuckoo's Eggs in Whitethroat's Nest.—Although few cases of eggs of the Cuckoo found in this country in nests of the Common Whitethroat have been recorded, there can be no doubt that this species is very frequently imposed upon by the Cuckoo. It is obvious that few birds are more likely to suffer from the parasitism of the Cuckoo than the Whitethroat; and the remarkable book on that bird recently published by Dr. Rey, of Leipzig, proves conclusively that this is actually the case. Did Mr. Loat satisfy himself that the Whitethroat mentioned by him (p. 229) did not lay its normal number of eggs? Is there not the strong probability that the Cuckoo before depositing her egg in the nest cast out and broke two eggs of the clutch?—J. B. DOBBIE (Pitt Street, Edinburgh).

Apropos of the remarks on this subject (p. 229), I may state that on June 3rd last I was shown an egg of the Cuckoo which had been taken

from a Whitethroat's nest a day or two previously. The lad who took it said there were two other eggs in the nest, and offered to show me where it was situated. I went to the spot, and found the Whitethroat's nest in an ordinary situation, *viz.*, about two feet from the ground in a tangle of nettles and bramble, and, strange to say, I saw a Cuckoo fly away from the bush as I approached it; the nest, however, on inspection contained no other Cuckoo's egg, but four eggs of the rightful owner. The presence of a Cuckoo so near the nest in which an egg of this species had been deposited tends to confirm a previously formed opinion that the parent Cuckoo, although not incubating its own egg, revisits the spot where it has been laid. I have observed the same thing before in the case of a Cuckoo's egg dropped in the nest of a Black-headed Bunting, but in that case the egg remained in the nest.—G. B. CORBIN (Ringwood).

Lesser Spotted Woodpecker in Captivity.—I have kept a female Lesser Spotted Woodpecker, *Dendrocopus minor*, in confinement for more than a year. It came into my possession, with a male, when they were nestlings only a few weeks old. Unfortunately the male died in early winter, during my temporary absence in Italy. The female has not been one whit less active since the loss of her companion. Her activity in wood-chipping is wonderful and very enterprising. Both sexes have the same call-note, "kink, kink" (rendered by Naumann as "kük"); but the male has, in addition, a sort of laughing cry, only uttered when he is excited, and even then but rarely. Having listened to these birds at all hours from dawn to twilight I am able to state positively that both male and female "churr." They have, in fact, three different beats: one is a loud "ratatatat"; the second is similar to the light tapping of the Nuthatch, *Sitta casia*; their third sound, generally called "churring," is produced by a succession of very rapid blows on one particular piece of bark. Both sexes produce this sound. My male bird produced it when only a few months old. The solitary female reproduces it occasionally for her own amusement. I cannot say that the Lesser Spotted Woodpecker shows as much attachment to its owner as the Greater Spotted Woodpecker (which makes a very affectionate pet), but it is a dainty little bird and a lively companion. It undergoes an entire moult in spring.—H. A. MACPHERSON (Carlisle).

The Lesser Tern at Dungeness and Pett.—Mr. Robert Warren's interesting account (p. 270) relative to the increase of the Lesser Tern in Co. Mayo, reminds me that this charming bird has appeared this year in slightly increased numbers at Dungeness. I have this from an observant resident whose acquaintance with the colony there extends over many years. Unfortunately I have been unable to realize a hope I entertained during the recent breeding season of visiting the spot before the young appeared, so as to reassure myself, and if possible gain an approximate idea

of the number of breeding birds. Last year I found the Common Tern greatly preponderating in numbers as usual. Westward, from the entrance to Rye Harbour to Winchelsea, is a fatiguing stretch (as is only too obvious when one labours thereon throughout a luckless winter day with a heavy double-barrel) of shingly coast, which widens as Pett Level is approached and then abruptly terminates in a barrier of rising ground, which continues in crumbly cliffs onward to Hastings. These "Levels" are yearly visited by a few pairs of the Common and Lesser Terns, but always in very precarious numbers. This year there has certainly not been an increase of the Lesser, as I noticed only two pairs breeding. I have not succeeded in verifying Mr. Gurney's belief that the Arctic Tern breeds near St. Leonards (*vide* Borrer, 'Birds of Sussex,' p. 259). Indeed I have not seen a single Tern of any kind on the beach between this town and Bexhill, some three miles to the west, during the two years of my residence here.—W. C. J. RUSKIN BUTTERFIELD (St. Leonards-on-Sea).

Dotterel at Scarborough.—On May 24th last I had brought to me for identification a handsome adult female Dotterel, *Endromias morinellus*, which had been killed that morning at Weaverthorpe, about nine miles from Scarborough. It was in perfect plumage, and on dissection the ovaries proved to contain well-developed eggs.—WM. J. CLARKE (44, Huntriss Row, Scarborough).

[The bird was probably on its way to its breeding haunts on one of the northern fells, and it is to be regretted that in the case of a species whose nesting haunts are now so restricted the bird should have been shot in defiance of the Wild Birds Protection Act.—ED.]

Polygamy in the Starling.—During the present summer I had under observation, in a hole in a large beech-tree in the middle of a wood, a nest of the Starling, which was owned by three birds. My attention was first drawn to them when building by seeing three birds in succession come out of the hole. I did not think much of the matter, supposing one to be a bird of another pair which had gone to the nesting-hole for the purpose of robbing some straw, &c.; but on passing the place the following day, and seeing the same thing happen, I determined to watch, and for that purpose climbed a neighbouring tree, and during a stay of a couple of hours had the satisfaction of seeing the three birds go into the hole with building materials several times. I had the nest under observation till the young had flown. I have never yet shot a nesting bird, holding that the non-observance of the old command laid down in Deut. xxii. 6 (mentioned by Prof. Newton as the "most ancient game-law in existence") is a powerful factor in exterminating a species, and I was, from the position of the hole, unable to secure the sitting bird for examination by means of a landing-net; but from what I saw I am inclined to think that two of the birds were cocks and the other

a hen, as the bird that I invariably put off the nest had—so far as I could make out with my glasses—the bill of not nearly so bright a colour as the other two, and the terminal spots appeared larger. I believe that this state of things, though by no means unknown, is at least of sufficient rarity to deserve a note thereon.—OXLEY GRABHAM (Flaxton, York).

The Hawfinch in Hampshire.—It is quite possible that the Hawfinch has of late years (as observed p. 272) extended its range and increased in numbers amongst us, if indeed the increase in the number of observers has not something to do with it. My experience points to the fact that it is a bird of somewhat irregular occurrence, in some years being much more frequently seen than in others; not that I have ever known it to be “very common” or “very rare,” in the general acceptation of the terms, at any season, usually occurring in the winter in the greatest numbers. Some years ago it bred in several parts of the New Forest, and I took the eggs and saw the young in all stages of growth; but since then I have been unable to visit the locality, so cannot speak with certainty. Coming near the present date, however, I may state that during the severe weather of last winter small flocks of Hawfinches were seen in various parts of the forest, and numbers were killed. The past summer has been productive of both eggs and young, and several nests have been taken. I have seen a comparatively large number of young birds with the dappled breast and under parts, and the more or less yellow plumage about the throat and neck; in fact, one young bird just able to leave the nest had its whole plumage suffused with this tint. I noticed, too, that the remarkably shaped falcated primaries were developed in comparatively young birds, whilst the black throat was wanting, or only very slightly indicated by a few dots in outline, in birds that were fully grown. That the species has been commoner than usual during the past summer is certain, but whether its frequency will be maintained, the future must decide. I have known several previous years when it was as common, but afterwards almost disappeared. Its presence is generally made known to those who grow peas in their gardens, the bird often doing great havoc amongst them. One of the nests of which I had a description was somewhat similar to that mentioned, in the note at page 232, as resting on a platform of leaves which prevented its being seen from below; but in this case the nest was situated in a small oak-tree, and the leaves had apparently been plucked from the surrounding branches.—G. B. CORBIN (Ringwood).

Migrating Birds rest upon the Water.—I have just been reading in Herr Gätke's ‘Birds of Heligoland’ (English translation, p. 129) his reasons for believing that migrating birds may occasionally rest upon the water. He quotes three instances which have come under his own observation. To these I may add a fourth, which closely resembles at least one of his.

While standing on the beach at Bordighera on Easter Monday last, watching the arrival of migrants, I saw a little bird descend, as it were, from the skies, and alight on the pebbles a short distance from me. I approached it, and found it so much exhausted as to allow me to take it in my hand. I had just identified it as a female White-spotted Bluethroat, when it slipped out of my hand and flew out to sea again. It very soon alighted on the water, where it looked to me just like a Storm Petrel, and after a short while rose again without difficulty. Again, however, it sank on the waves, to rise in flight once more, after which I lost sight of it. I may add two other facts which will possibly be of interest. During the ten days I was at Bordighera, from April 13th to April 23rd, I only once saw the birds arriving in any numbers on the coast, and that was in wet and cold weather, with a wind from N.E. Yet all the time there were signs enough that they were crowding in—the olive groves being full of them, and the species changing almost from day to day. The bad weather apparently kept them low, and brought them to my notice. Secondly, I observed a remarkable migration of Swifts, Swallows, and House Martins, with a few Alpine Swifts, along the coast *eastwards*, on April 19th. Thousands passed over me, going at a speed which I tried to measure by noting their progress from point to point, and roughly calculated at two miles and a half per minute. This eastward migration, after the birds arrive on the south coast of France, I cannot find alluded to in books; though Herr Gätke has suggested it in his chapter on the “Direction of Migration Flight.”—W. WARDE FOWLER.

Redshank breeding in Sussex.—The Redshank, says Mr. Borrer in his excellent county avifauna (p. 244), still breeds (1891) in a few places in Sussex, such as Pevensey Level, whence he has received its eggs within the last few years. During the present summer, when revisiting Pagham Harbour, or rather the site of what was once Pagham Harbour, now alas! completely destroyed by drainage and partial reclamation, I came upon two pairs of Redshanks, which were nesting in high grass in one of the least accessible spots still partially surrounded with water in the bed of the old harbour. They were very noisy, and comparatively tame, as such birds usually are in the breeding season, flying overhead in circles, often within gun-shot, had I been disposed to secure one. My only weapon, however, was a field-glass, and I was much entertained in watching their beautiful evolutions on the wing, as they circled round their nests, piping at intervals their wild melodious notes, so much in keeping with the dreary waste over which they hovered.—J. E. HARTING.

Little Crake in Sussex.—A Little Crake, *Porzana parva* (Scopoli), was caught near Battle by a dog on the 30th of June last. The bird was brought to Messrs. Bristow, taxidermists of St. Leonards, for preservation,

and was by them submitted to me for identification; it had, when killed, the red band at the base of the mandibles, one of the distinctive marks of difference between it and Baillon's Crake. Mr. Dresser, in his 'Birds of Europe,' has recorded three examples of Sussex-killed specimens: one said to have been observed near Hastings in April, 1859; one at Seaford in March, '1848; and another near Pevensey in March, 1862.—THOMAS PARKIN (Fairseat, High Wickham, Hastings).

Quails in West Sussex. — I am glad to be able to report that Quails are with us again this season. On July 10th I heard the well-known note of this bird in a wheat-field about 200 yards from my house, and on the 12th I flushed one of the birds. It is three years since I saw any in this field. In former years I have come across a considerable number of Quails round about this village, and, as already mentioned, I think, in 'The Zoologist,' have known them to breed here. — H. MARMADUKE LANGDALE (Compton, Petersfield).

Nesting Habits of the Common Whitethroat.—In June last a pair of Common Whitethroats built a nest in our garden, and after the nest was complete the hen bird was observed to sit in it for fifteen days before an egg was laid. This I consider very unusual. — J. WHITAKER (Rainworth, Mansfield, Notts).

Nutcracker near Chichester.—Mr. John Hale, butler at the Deanery, Chichester, lately showed me a remarkable bird which was shot on the 3rd November, 1893, in Stockbridge Fields, near Chichester. Its large size (about 14 inches in length), corvine appearance, and spotted plumage made me think it must be a Nutcracker, *Nucifraga caryocatactes*, but, to make quite sure of this, I carried the bird in its case to the Natural History Museum, where I had the satisfaction of learning that I was right. As Mr. Borrer, in his 'Birds of Sussex,' mentions but a single example of this bird obtained in Sussex, namely, one shot at Littleington in Sept. 1844, it may be well to place on record the occurrence of a second and more recent specimen.—H. D. GORDON (Harting Vicarage, Petersfield).

REPTILIA.

Tritons devouring Newts.—In April of the present year I put a large number of Newts, together with ten Tritons, into a glass vessel containing from six to seven gallons of water, partly for the sake of observation and partly with the idea of amusing the children. From time to time it struck me that the numbers of the Newts diminished, and having made sure that none could make their escape, I watched more closely till I caught a female Triton with the tip of a male Newt's tail showing out of her mouth. Having caught the Triton, I pulled the Newt out; its length was three inches and a trifle over.—H. MARMADUKE LANGDALE (Compton, Petersfield).

Newt killed by a Bee.—One hot morning, the cover being off the aquarium, some working bees sought the water. Whether a Newt dashed at the Bee or the latter pitched on the Newt's head, I am not sure. At any rate the Bee attacked the Newt, and digging its sting in under the jaw was immediately taken under water and drowned. The Newt afterwards succumbed, owing, I think, to suffocation caused by inflammation in the throat.—H, MARMADUKE LANGDALE (Compton, Petersfield).

INSECTS.

A Flight of "Parasol Ants." — On May 25th last I had occasion to attend at the Port of Spain railway station, and proceeding thitherwards in the early morning, found the road all along the route from the Gardens to the station covered by myriads of the winged form of the "Parasol Ant" known as *Atta Güntheri*, Forel., which is so common in the neighbourhood of the town of Port of Spain, to the exclusion of its larger relative *Atta cephalotes*, the woodland "Parasol Ant." Opportunity is taken of this occurrence to point out the lesson it teaches, which is, that the nest of the "Parasol Ant" should always be destroyed previous to the time of the annual flight, which occurs generally in May or June. During this annual flight it is certain that the sexes pair, and those which survive are certain to become the founders of new nests in the most suitable situations in which they happen to find themselves. If, however, the parent nests were destroyed during the early months of the year, before the winged or perfect forms are produced, the attempt to reduce their numbers in the colony would have a better chance of success.—J. H. HART (Botanic Garden, Trinidad).

NOTICES OF NEW BOOKS.

Horses, Asses, Zebras, Mules and Mule-breeding. By W. B. TEGETMEIER and C. L. SUTHERLAND. 8vo, pp. i-viii, 1-166. With numerous illustrations. London: Horace Cox. 1895.

THE authors of this volume have done good service in bringing together under the above heading some useful statistics from many scattered sources of information. Especially valuable are the remarks of Mr. Sutherland on Mules and Mule-breeding, on which subject he brings to bear the experience of a quarter of a century. Much of this information is new in the sense that it has not previously appeared in print, and it is curious that in the very extensive literature which exists on the subject of the Horse

and its allies, no book devoted exclusively to the Mule has hitherto been printed in England, although an English treatise by Harvey Riley was published in New York in 1867,* and another by Mr. C. L. Jones, of Columbia, Tennessee, is to be found in the last volume of the Annual Reports of the Bureau of Animal Industry, printed by order of the American Senate.

Mr. Tegetmeier, by the way, is mistaken in asserting, as he does in the very first sentence of his preface, that out of 4000 works on Horses and their utilization, about "one half" have been printed in Great Britain. We have the best of reasons for stating that "one quarter" only of these can be credited to Great Britain, having made the original calculation upon which the statement is founded (Zool. 1890, p. 121).

It is somewhat disappointing to find nothing in the volume before us on the history of the Mule and its introduction into Western Europe, for on this part of the subject a most interesting chapter might have been written.

The *Mulus* (Greek *μύλος*), or Mule, was brought into Italy, as the name shows, from Greece. The Latin name was afterwards used by all the nations which adopted the animal. In Varro's time, just as now, carts were drawn along the high roads by Mules, which were not only strong, but pleased the eye by their handsome appearance. The Greeks were equally delighted with the animal.† Pliny mentions a Jack-ass that was bought for the stud at the price of £3229 3s. 4d., and states that in Celtiberia, a province of Spain, a she Ass brought foals to the same value. Varro alludes to an Ass that was sold in his time in Rome for £484 7s. 6d. Plutarch in the life of Valerius Poplicola observes that the price of a Sheep was about ten *oboli*, or nearly 13d. of our money, and that of an Ox ten times as much, or about 10s. 10d.

Capt. Huth in his bibliography of 'Horses and Equitation' (4to, 1887) mentions no less than thirty works on Mules and Asses published between 1495 and 1883, and had Messrs. Tegetmeier and Sutherland been at the pains to look into some of these they might have extracted some curious and pertinent information.

* 'The Mule: a Treatise on the Breeding, Training, and Uses to which he may be put.' By Harvey Riley. 12mo. New York. 1867.

† Victor Hehn, 'Wanderings of Plants and Animals from their first home.' See 'Zoologist,' 1886, pp. 258—260.

It is perhaps not surprising that the earliest book treating of Mules was written by a Spaniard,* seeing that Spain has long been famous for these animals, and the Spanish Asses are celebrated for their size, height, and elegant build. A writer on Asses and Mules, whose essay has escaped notice by both Capt. Huth and the authors of the volume before us, comments on the height of Spanish Asses (sometimes fifteen hands and upwards), and states that at the date of his remarks (1801) the best of their kind would sell even in Spain at very high prices, fetching sometimes a hundred guineas and more.†

The work of J. E. Ridinger on Horses, Asses, and Mules (folio, 1754) might have been consulted with advantage, if only to direct attention to the excellent illustrations which show the points which were held in estimation at that date as compared with those now in fashion. Then there is the treatise by John Mills, F.R.S. (8vo, 1776), on 'The Breeding, Rearing, and Fitting for Use Horses, Asses, and Mules, with Directions for the Treatment of their Disorders.' Passing over some half-dozen works in German and Italian which followed that of Mills, we come to a volume of similar title and scope by R. L. Allen, which was printed in New York in 1848, and reprinted in 1852. Somewhat nearer to our own time, we find the veterinary work of M. Roche, which deals exclusively with the Ass, and expounds the French method of treatment.‡ We refer to these works merely for the purpose of showing that the recently published volume of Messrs. Tegetmeier and Sutherland is by no means exhaustive, and in several particulars might be materially amplified and improved.

It is a curious fact which seems to be well vouched for, that the duration of life in the Mule considerably exceeds that of either the Horse or the Ass. Capt. Langhorne Wister, of Philadelphia, a well-known breeder of Mules, writes:—"I think I can say that Mules live on an average five years longer, and are able to do heavy work at least seven or eight years longer, than Horses; they thrive on coarser food, and are more free from disease." He

* Manual Diaz, 'Libro de albeiteria, es a saber de los Cavallos y de las Mulas,' folio, Saragossa. 1495. This work has been frequently reprinted; no less than seven editions are mentioned by Huth.

† Anderson, 'Recreations in Agriculture and Natural History,' 1801 vol. iv. pp. 321—334.

‡ 'L'Ane. Médecine Vétérinaire,' par A. E. Roche. 12mo. Paris. 1882.

adds:—"They are very easily broken by those who understand them, but need kind treatment, as they are apt to repel force by force, *i. e.*, by kicking or striking with the forefeet" (p. 78).

On the subject of the non-fertility of Mules we are told (p. 80) that those who have paid the greatest amount of attention to Mule production and Mule industry, know of no instance of a female Mule producing young. A figure is given of a supposed fertile female Mule living at the "Jardin d'Acclimatation" in Paris, but in the opinion of the authors "this is not a case of a fertile Mule breeding, but of an ordinary mare whose female parent was influenced by a first alliance." Its mule-like appearance is singular, possessing, as it does, the short head and long ears of a Mule, as well as a mule-like tail. Some observations on this very animal have been already published in 'The Zoologist' (1888, p. 103), where Mr. Sutherland has remarked that its history is not forthcoming, and if this were unimpeachable, it would, in his opinion, be the sole authenticated case of the kind which he has heard of in an experience of thirty years on the Continent of Europe and in the United States. He adds that in Poitou (where some 50,000 mares are kept for Mule-breeding) all the experienced breeders disbelieved in this Parisian so-called fertile Mule, there being no record in Poitou of a female Mule having produced a foal.

By way of supplement to these remarks, we may direct attention to two other cases upon which Messrs. Tegetmeier and Sutherland offer no comment. In the 'Sporting Magazine' for 1818 (p. 176), will be found an account of a Mule in Suffolk which produced a foal, and another case of the kind is mentioned in 'The Field' of 15th July, 1873, where it is stated that a foal (the produce of a Mule and Donkey) was seen by Mr. E. L. Layard, and was presented for preservation to the Cape Town Museum.

Our pen has run away with us to such an extent on the subject of Mules (to which the second half of the volume before us is devoted), that we find little space left for comment on the remaining chapters, ten in number. These relate to the Horse, including a notice with a figure of Prejevalsky's Horse from central Asia, the wild Asses of Africa (Somaliland) and Asia, the different species of Zebra, and Hybrid *Equidæ*, on which some remarks by the late Mr. Jenner Weir will be found in 'The Zoologist' for 1888, p. 102.

The chapter on the Horse, which extends to less than half-a-dozen pages, is the least satisfactory in the volume, and is disappointing in view of the enormous amount of material which exists for review and utilization. The succeeding chapters on Asses and Zebras contain more information; the illustrations by Mr. Frohawk deserve especial commendation.

Seventeen Trips through Somaliland: a Record of Exploration and Big Game Shooting, 1885 to 1893. With descriptive Notes on the Wild Fauna of the Country. By Capt. H. G. C. SWAYNE, R.E. Cr. 4to, pp. i-xx, 1-386. With numerous illustrations and maps. London: Rowland Ward & Co. 1895.

SOMALILAND is the home of most of the African large game, and at the present time affords one of the best and most accessible of hunting grounds. Not many months ago we had occasion to notice Lord Wolverton's 'Five Months' Sport in Somaliland' (Zool. 1894, p. 275), which we were compelled to characterise as "a mere record of shooting which adds nothing to what was previously known concerning the natural history of the country traversed." The same cannot be said of Captain Swayne's book, which stands upon a very different footing. In the first place the result of no less than seventeen different journeys, undertaken between 1884 and 1893, has placed the author in possession of a far better knowledge of the country than was acquired by his predecessor; and in the next place his qualifications as an experienced field naturalist enabled him to profit largely by his opportunities.

There is naturally a considerable sameness in the narratives of African sport and adventure which are published from time to time; the authors pursue and kill the same species of wild animals—Lions, Elephants, Giraffes, Antelopes, and Zebras; and we imagine that by this time every conceivable condition under which they may be found, and every possible mode in which they may be killed, has been described with more or less variation. On this part of the subject little can remain to be said. But in regard to the haunts and habits of some of the little-known Antelopes, and the precise limits of their range in Africa, we have still something to learn, and it is in this respect

perhaps more than any other that Capt. Swayne's book will be found valuable. In addition we get the benefit of his advice as to routes, and many a useful hint (pp. 331-360) as to equipment, stores, and weapons, invaluable to future explorers.

Capt. Swayne has enjoyed unusual advantages for indulging his love of sport and natural history. At the outset of his travels his age was five-and-twenty. He enjoyed absolute freedom of movement, and at this period had full control of a small escort of Indian cavalry. The sense of responsibility and the prospect of exploring new country filled him with delight and awakened his faculties. When he first entered the interior of Somaliland, in 1885, it was practically an untraversed country, and hitherto—though, as he says, unjustly—it had always borne the reputation of being the desert home of bigoted and ferocious savages. His object in writing this book, he tells us, is to present phases of nomadic life in North-east Africa, and to supply detailed information that may prove useful to future travellers and sportsmen in that country. In this, it seems to us, he has admirably succeeded, and although in his preface he modestly characterises what he has written as a mere collection of facts, the careful notes which he has made of all that came within his observation will be found to possess the highest interest for naturalists. Most of the illustrations are reproductions of his own drawings, and although they cannot be said to possess much artistic merit, they convey with sufficient effect the appearance and characteristic attitudes of the wild animals met with as they would strike an observer viewing them for the first time. Some of these sketches look a little grotesque, as, for example, the figure of Clarke's Gazelle on page 312, where a buck of this species is represented as trotting away with his head and neck carried perpendicularly, and a remarkably long tail carried straight up over the back. But this, it seems, is a peculiarity by which it may be distinguished from the allied Waller's Gazelle. An excellent comparison of the two, with a description of their appearance and habits (which, as their long necks would indicate, are very Giraffe-like), is given (pp. 311-313), with figures of the heads and horns.

For a knowledge of one of the largest and one of the smallest Antelopes, namely, the Somali Hartebeest (*Bubalis swaynei*), "about as large as a Donkey," and the Dik-dik (*Madoqua swaynei*),

which weighs less than an English Hare, we are chiefly indebted to the author of the book before us. His account of these two species, as indeed of other animals met with by him, is most interesting.



THE SOMALI HARTEBEEST, *Bubalis swaynei*.

With all his love of sport and adventure, we are glad to note that he counsels moderation in the slaying of big-game, and we feel sure that his remarks (p. 295) on the disappearance of Elephants from certain parts of Somaliland owing to the inconsiderate destruction of the females will commend themselves to every reader of his book.

“In the first enthusiasm of Elephant-shooting,” he says, “it is conceivable that a sportsman may shoot two or three cows as well as bulls, as I have done; but there is no reason, except the temptation afforded by very exciting sport, why large numbers of Elephants of both sexes should be destroyed in Somaliland. They do no harm to the few plots of cultivation scattered at wide intervals, and very few Somalis will eat their flesh. Though the

Elephants themselves are of the average size, this mountain ivory is probably as small as any to be found in Africa, sixty pounds being a very good pair of tusks."

The question of the desirability of training and using the African Elephant for transport is one which will become more important as Africa is opened up. Provided something could be done to stop the wholesale slaughter of Elephants by English sportsmen, there is still a probability that the whole of our Somali Protectorate would become restocked, for in the chaos of rugged gorges which descend abruptly from the Harar Highlands into Ogáden there are still plenty.

We note that, in addition to the author's route map, there is a very good "Hunting Map," so called, of Northern Somaliland, which will enable the reader to identify the haunts of the different kinds of wild animals mentioned in the text.

London Birds and Beasts. By J. T. TRISTRAM VALENTINE.
With a Preface by F. E. BEDDARD. Post 8vo, pp. i—xii,
1—319. London: Horace Cox. 1895.

WE confess to have been somewhat startled by the announcement of a new book by Mr. Tristram Valentine, happening to know that, to the regret of his many friends, he died just two years ago—in August, 1893. Neither on the title-page nor in the preface do we find any mention of this fact!

Whether it was wise to publish this collection of essays from periodicals without some revision or correction in the shape of editorial notes, is a question upon which it would seem there is some difference of opinion. We cannot help thinking that greater justice would have been done to the deceased author if his editor had shown that his observations (some of them written six or seven years ago) were in the main correct at the date of their original publication, but have since become incorrect, or perhaps we should say incomplete, by lapse of time. For example, in the chapter on "the English Wild Bull" (pp. 51–59), written in July, 1890, we find an allusion made to the arrival at the Zoological Gardens of a young white bull, presented by Earl Ferrers, from his famous herd at Chartley, in Staffordshire, an animal "new to the collection." So far so good; but since those lines were penned a

second example has been received in the shape of a white heifer presented by Mr. Assheton Smith from the Vaynol herd; and what is of some importance to note, the two animals have mated and produced offspring. A footnote to this effect would have exonerated the author from a possible charge of having overlooked what is now a well-known fact. This leads us to say that the title of the book is not well chosen, and is in point of fact misleading, for on turning over the pages we discover, to our disappointment, that all the so-called "London Beasts" and many of the "London Birds," are simply dwellers in "the Zoo"! while chapters on Leaf Insects, Tarantulas, Chamæleons, and Crocodiles—all interesting enough in their way—finding no place in either of these two classes, have been "sandwiched" between them. This is unfortunate; but after all, it may be asked, "what is in a name," provided the subject-matter be good? At any rate these collected essays will furnish pleasant reading for an idle hour, and should they serve no better purpose, they form a fitting and acceptable souvenir of a very estimable man, a most agreeable companion, and, as his writings show, a keen lover of natural history.

Forest Birds, their Haunts and Habits: Short Studies from Nature. By HARRY F. WITHERBY. Post 8vo, pp. 98. London: Kegan Paul & Co. 1894.

BURIED for some months under the daily accumulating burdens of an Editor's table, this little volume, chiefly on account of its small size, has escaped attention until now. It would be hardly fair to the author, on that account, to pass it by unnoticed, though it cannot well be characterised as a new book. Although evidently written by a beginner, it is not without merit, and its chief recommendation is the writer's attention to accuracy in details. His chief aim, as he tells us in his preface, has been "to accurately record his own experience and observations in the life-history of the eight species of birds described in these pages;" and he adds that "the information presented has been, with few exceptions, the result of many hours of patient watching and waiting on the part of the author." This is as it should be, and although the species dealt with are among the best known of common birds, the way in which they are dealt with, especially

in regard to details of structure, gives promise of better things from one who has evident power of observation and only lacks experience.

We look upon photographs of stuffed birds as the worst possible form of book illustration, and therefore cannot praise the full-page plates, in which many defects of badly mounted specimens are reproduced and emphasized. In future essays the author would do well to confine his illustrations to such original drawings as furnish text-cuts in the present little volume.

In Grouseland. By EVAN G. MACKENZIE. Post 8vo, pp. i—viii; 1—248. London: Swan Sonnenschein & Co. 1895.

THE appearance of this little volume just before the opening day of Grouse-shooting was well timed, and it will have attraction for all who find charms at this season of the year amidst the purple moorlands, where the impressive silence is first awakened by the note of the gor-cock, to be followed by the echoing report which too often, alas! proclaims its death. The subject is a well-worn one, but Mr. Mackenzie handles it pleasantly enough, and if he does not tell us much that is novel, he puts forward some old truths from a new point of view, and occasionally gives a useful hint derived from experience. This book consists of two parts. The first part, containing some twenty chapters, deals with such topics as heather-culture, grouse disease, rent of shooting, "driving," deer-stalking, &c.; the second part consists of a series of letters (supposed to be addressed to the author by the tenant of a highland shooting lodge) full of local gossip such as would naturally occupy the attention of sportsmen at this time of year, and on that account very pleasant reading. We especially commend for perusal the chapter on "Grouse-shooting leases," which contains some serviceable remarks and good advice to those who think of renting grouse moors.

THE ZOOLOGIST

No. 225.—September, 1895.

ON THE "HEPATIC" PLUMAGE OF THE CUCKOO.

By FREDERICK COBURN.

ON May 4th and 17th, 1895, I received two specimens of *Cuculus canorus* in the "hepatic," or liver-coloured, phase of plumage.

The first was shot by Mr. F. C. Clare in his garden, and the bird was so curious in appearance that Mr. Clare did not know that he was shooting a Cuckoo.

The second specimen Mr. Clare found on May 17th on his garden-path, and, to use his own words, "it appeared dazed, and allowed itself to be picked up." A *post-mortem* disclosed a bruise on the skull, which might have been caused either by a stone thrown at the bird, or by its having accidentally come in contact with a post or bough of a tree while endeavouring to elude the pursuit of the male. This would account for its dazed and helpless condition.

On dissection both birds proved to be females, with well-developed ovaries. These birds are in that most interesting state of plumage, the change between the "hepatic" and the adult, and a careful examination of them, also of males and females in the nestling plumage (August 6th, 1895), will enable me, I think, to clear up the mystery which Mr. Harting, in his excellent article (p. 257), seems to think surrounds this hepatic stage of plumage.

Selby was quite right in remarking that "the young females have more of the reddish brown disposed over their plumage," &c.; for all young males I have dissected are much darker in colour

than females: in some specimens they have quite a blackish appearance about the head, neck, and dorsal region, while the females have always had a lighter and redder general appearance.

But young Cuckoos vary considerably. In one male I have there is a large white patch on the forehead, and another on the nape, while in the darkest example of a young male in my collection there is no trace of white on any part of the head.

All the authorities quoted by Mr. Harting are wrong in supposing that the change from the nestling to the hepatic plumage, or from the hepatic to the adult plumage, is the result of a moult.

I do not think that any moult takes place even between the autumn condition of the young bird and the full grey plumage of, say, June.

It is probable that fuller investigation will prove that the adult Cuckoo moults once only in the year, and that after its breeding operations are ended, and probably after it leaves this country. On this point I received lately some curious and interesting information from a friend, Mr. Charles Lunn, to the effect that last year he reared a young Cuckoo, and has it still living. It is very tame, knows its master, and has become omnivorous in its diet, preferring cooked vegetables to meat. It remained in its nestling plumage throughout the winter; and up to past the middle of July there was no sign of any attempt to moult on the part of the bird, but suddenly the feathers began to fall out, and the bird soon became absolutely naked. It did not appear to suffer in health or spirits, but the new feathers began to appear before the end of the month, and according to Mr. Lunn, "they grew with marvellous rapidity."

My conversation with Mr. Lunn took place before I had read Mr. Harting's article, otherwise I might have put several questions to him bearing on the subject, which must now be deferred until I receive another visit from him, for I have not his present address.

There are many birds which do not moult so frequently in the year as we have been led to suppose, and a change of colour in the feather does not always mean a moult. Neither is it always the result of the wearing off of the tips of the feathers, as suggested by some.* But it is caused by the gradual fading away

* I do not agree with the conclusions of Herr Meves, and shall, I think, when the proper time arrives, be able to completely upset this widely accepted theory,—of the wearing off of the tips of the feathers.

of the colouring matter of the feather, or, on the return season, a gradual development of the same colouring matter in the old feather.

This is, I know, a subject of great importance, and one which is not yet understood by ornithologists; but I have been patiently working at it for some years, and have collected such a mass of information as to leave no doubt in my mind that my theory is correct, for I can show feathers in all stages of fading and acquiring the colouring matter, and also showing two distinct and widely different states of plumage on one feather.

So far as my experience goes, the chief moulting period for wild birds is in the autumn, after the breeding season. Spring moults are comparatively rare, and when they do occur are generally only partial.

This is obviously a subject which I cannot fully deal with in this article. Suffice it to say that the two Cuckoos under notice fully confirm my previous investigations. They show at a glance both the hepatic and the adult stage, and show also that the cinnamon or reddish colour is slowly fading away and giving place to the grey stage, *without moulting*. In the bird most advanced towards the grey plumage there is not a trace of moulting, while in the other there is one solitary rectrix moulting, but I think it highly probable that this was to replace one accidentally lost, for the new rectrix is of the hepatic and not the grey type.

Mr. Harting (pp. 257, 258) has minutely described his bird which was shot in April, and it will be seen that the whole of the upper parts displayed the reddish tinge of colour.

My first bird, shot on May 4th, shows on the crown of the head the grey of the adult, but the feathers very faintly barred in the middle with sandy brown, almost imperceptible until they are divided. The sides of the head, the lores, chin, and throat are a greyish white, suffused with pale brown and very faintly barred. The whole of the neck, upper back, and breast are of a cinnamon or light liver-colour, barred with blackish. The primaries and secondaries are a faded brown, spotted and barred on the outer and inner webs with reddish; some of the tertiaries are distinctly brown. The scapulars and all the wing-coverts are grey, with very distinct brown spots. The back and rump is grey, as in the adult, but with a trace of brown spots here and there. The upper tail-coverts distinctly reddish, and

the tail just as in Mr. Harting's specimen. The under tail-coverts are cream-white; only the longest of them are spotted and streaked with black. The whole of the under parts from breast to vent white barred with blackish, but not so distinct as in the grey bird. Irides brownish yellow; bill horn-brown, paler at the base; gape, legs, and toes pale orange-yellow.

My second bird, procured on May 17th, has the whole of the head, chin, and throat grey, as in the adult; the neck and breast reddish, barred with blackish, but much fainter than in the first bird. The wings are a greyish brown, with the faintest trace only of reddish spots. The scapulars are grey, with only a tinge of brown; the back and rump is that of an adult bird, and the tail has lost nearly all the hepatic colour and almost resembles that of the adult. The under parts are white, more distinctly barred with black than in the first example, and almost as boldly as in the adult grey bird. The under tail-coverts are creamy white, all of them spotted and barred with black. The irides more distinctly yellow. Bill blackish horn, paler on the edges; gape bright orange; tarsi and toes dull yellow.

Here, then, we have the gradual fading away of the hepatic plumage as in Mr. Harting's distinctly red bird shot in April, to one almost grey obtained on May 17th, and I have no doubt that by the first week in June all trace of the red stage would have vanished.

A full-fledged female nestling Cuckoo shot on Aug. 6th, 1895, measures $12\frac{1}{4}$ in., one of those shot in May measures $12\frac{3}{4}$ in., so that there is practically no increased growth between the young birds of August and what we may call the adult of May, for both adults and young which I have measured vary to the extent of half an inch.

This immature female bird and the specimen procured on May 4th, when compared, show all the markings in common, and it is easy to see how the darker red of the young bird might gradually fade away and leave the light red of the hepatic stage. Then compare the second bird with the first and with one in full grey plumage, and the gradual fading away of the hepatic stage is unmistakably manifest.

The rarity of Cuckoos in the hepatic condition of plumage in England,—and I have no doubt as to their infrequency, for throughout my long experience of some thirty years these are the

first two I have met with in the red dress, although I have occasionally had examples with a feather here and there which had not changed colour,—may be accounted for by the fact that the change of colour in the feathers takes place, as a rule, *before* the birds come to us in spring, and this will also explain their comparative abundance on the Continent.

In a normally healthy bird the change of colour would take place rapidly. The specimens in the red condition of plumage which we get in this country are simply examples of retarded development. The cause of this failure on the part of the bird to change the colour of its feathers at the proper time is known to me, but for the present I reserve information on this point.

It must be remembered that all red Cuckoos met with either in England or abroad have been in the months of April or May. We have no record of one found in June. What, then, becomes of the hepatic Cuckoos after April or May? The only answer, I think, to this question is the theory I have above suggested.

I do not think that Mr. Seebohm is right in asserting that “the female Cuckoos just entering their second year do not breed.” From the examination of the ovaries in my two birds, I should unhesitatingly say that they were breeding females. And I cannot refrain from directing attention to the singular fact that all the red Cuckoos whose sex has been ascertained have proved to be females, with the exception of those mentioned by Temminck.

Mr. Harting states that the female examined by him showed no marked development of the ovaries. If the bird was shot early in April, no marked development could be expected in a young bird; but every week—nay, every day—would add to the development of these organs at the breeding period.

To briefly summarise, then, it seems to me that (1) *Cuculus canorus* in the red or hepatic phase of plumage is the young bird of the ensuing spring; (2) that it does not moult until it is over twelve months old; and (3) that it is a gradual change of colour in the feather which transforms it from the reddish nestling stage to that of the adult grey bird.

IN QUEST OF BIRDS ON THE MUONIO RIVER.

BY A. SUTTON DAVIES.

THE River Muonio, as most ornithologists are aware, forms the natural frontier between Swedish and Russian territory where those two countries adjoin one another, or, more strictly speaking, between Swedish Lapland and Russian Finland. Taking its rise from Lake Kilpis-järvi in Finland, close to the Norwegian frontier, and not more than thirty miles from the Lyngen Fjord in Norway, the river flows in a southerly direction to the Gulf of Bothnia, more than three hundred miles away. The country being low, with no mountains of any size, there are long stretches of still, unbroken water on the river; but on the other hand, there are several places where the rapids extend almost without a break for six miles. The banks are low, and densely fringed with willow-scrub and stunted birch-trees; while great stretches of "tundra," the breeding-places of countless birds, stretch on either side up to the rounded hills which form the river valley. This district has been rendered famous in the annals of ornithology by the late John Wolley, who, making his headquarters some forty years ago at Muonioniska, a little south of lat. 68° N., worked the country round for several years. The upper parts of the river, however, have been but little explored, Wolley himself having only passed through them once on his way from Norway to Muonioniska: and it was with the object of fishing and observing birds on the upper Muonio that we left England on the 18th June last.

So many ornithologists have travelled up the Norwegian coast that the features of its bird-life are now tolerably familiar. As we went northwards Gulls, Oyster-catchers, Terns, Richardson's Skuas, and Guillemots (*Uria troile* and *U. grylle*) became more and more frequent. At Tromsö, where we had to spend several hours on June 25th, we found young Fieldfares and Bramblings just leaving the nest in the birch-woods. The night of June 25th-26th was spent on the island of Sjaervö, lat. $70^{\circ} 3' N.$, where by the light of the midnight sun we visited a colony of Herring Gulls situated upon the top of a hill above the sea. Although there was an inaccessible cliff close by, with plenty of nesting room, the Gulls apparently preferred the flat ground at

the top, which was covered with nests. Most of the eggs were somewhat incubated. On our way down from this colony we disturbed a hen "Ryper" (*Lagopus albus*) from her nest under a rock. The nest, which was artfully concealed by a curtain of trailing plants which hung down from the rock above, contained ten incubated eggs, very much like those of our Red Grouse, but slightly smaller. On a pebbly beach at the foot of the hill we found a nest of the Oyster-catcher (*Hematopus ostralegus*) containing two eggs.

Skibotten, our destination on the Lyngen Fjord, was reached on the evening of June 26th, and we at once began our march towards the frontier, following the little Salmon River which falls into the fjord here. Yellow-hammers and Blackcaps were both seen and heard joining with the Redwings, Bramblings, and Mealy Redpolls in the general bird-chorus which began at 1 a.m. Higher up the valley we fell in with Blue-headed Yellow Wagtails, Bluethroats, and Rough-legged Buzzards; also with mosquitoes, that did not cease to remind us of their presence until we returned to Skibotten twenty-eight days later.

At Helligskoven, a little mountain hut occupied by a Finn with a Lapp wife, we rested for twenty-four hours. Here we found a nest of the Blue-headed Yellow Wagtail in a hole at the foot of a birch, with well-fledged young. There was also an addled egg, which resembled almost exactly the egg of the Yellow Wagtail. On comparing it with specimens of the latter at home it was impossible to distinguish between them. Here we saw and shot a specimen of the Northern Black-bellied Dipper: we did not see a single bird of this species after crossing the frontier. We crossed into Russian Finland on June 28th, and rested in an unoccupied shelter on the shores of Kilpis-järvi, the lake from which the Muonio takes its rise. In the willow-scrub near the house Bluethroats, Lapland Buntings, and Red-throated Pipits were very numerous; we found a nest of the latter in the side of a grass tussock, containing four incubated eggs.

As it would be an endless task to enumerate the birds seen each day, it will be more convenient to give a general summary of the observations made during the month spent between Finland and Sweden; a river separating the two countries, we were constantly passing to and fro, and it is therefore unnecessary to make any more marked distinction between them.

Of Thrushes we observed only the Fieldfare (*Turdus pilaris*) and the Redwing (*T. ilacus*). The Fieldfare all the way down to Kaaresuando was very uncommon. Fir-trees do not occur higher than lat. 68° 30' on this river, and it was not till we reached the fir-woods that we saw a single bird of this species. We only found one colony, and the natives all agree that upon the upper Muonio the Redwing, whose song is to be heard everywhere, is far the commoner of the two.

We did not find many Wheatears, and never saw a Whinchat.

The Redstart is fairly common, and is known to the natives by a name signifying "poor, or worthless, sort of a Bluethroat." It generally builds in deserted holes of the Lesser Spotted Woodpecker.

The Willow Wren was the only species of warbler observed, and this was very abundant. The Finns, who are nearly always keen observers, could not tell me of any other species of warbler.

The Bluethroat (*Cyanecula suecica*) was very abundant in the willow-scrub; its song continued all night, even when all other birds were silent—*i. e.*, from 11 p.m. to 1 a.m. This bird has marvellous powers of imitation, and the long continuous strain, consisting of the songs and notes of other birds connected by little passages of warbling, reminded us greatly of the Sedge Warbler.

Of Tits, the Northern Marsh Tit (*Parvus borealis*) and the Lapp Tit (*P. cinctus*) were the only species observed, and these were very uncommon, being seen only in the fir-growth.

Around every house were one or two broods of White Wag-tails; but as there are only a dozen houses between the frontier and Kaaresuando, a distance of seventy miles, they can only be called proportionately plentiful. Blue-headed Yellow Wagtails swarmed along the sides of the river, and in the marshier parts of the "Uoma" or tundra-like moors.

We found the Meadow Pipit (*Anthus pratensis*) in several places; but the predominating species was always the Red-throated Pipit (*A. cervinus*), one of the characteristic birds of the Uoma. We discovered three nests: those found on June 28th and 29th contained incubated eggs; but one found at Keinovuopio on July 27th contained five fresh eggs. We did not observe the Tree Pipit (*A. trivialis*) or the Pied Flycatcher (*Muscicapa atricapilla*); the latter species was not recognised by any of the Finns when I showed them my note-book in which I had made drawings of all species which I thought likely to be met with.

House Martins abounded in the neighbourhood of dwellings. The Finns encourage them by placing laths under the eaves to support the nests; and we counted as many as seventy nests on a single hut. In some places they were building in nest-boxes of birch-bark. We met with the Sand Martin at Kaaresuando, where it was building in the low sandy banks of the river.

The Shore Lark (*Alauda alpestris*) occurs on the higher ground towards Kautokeino in Norway, as does the Snow Bunting; the magistrate at Kaaresuando had stuffed specimens, but we did not observe any *en route*. The Lapland Bunting was one of the commonest birds on the Uoma; they frequented the more open parts as well as the willow-scrub, and the males in their glorious plumage might be seen everywhere perched on a hillock, and uttering their melancholy call-note, which resembles faintly that of the Golden Plover. Several Reed Buntings were observed, but no Yellow-hammers after crossing the border.

Bramblings (*Fringilla montifringilla*) were extremely common, and we found many nests, but most of the eggs were still fresh at the end of June. Though heard all day long, the birds are very shy, and seldom seen. The nest resembles that of the Linnet. To compare it to that of the Chaffinch does not seem quite accurate, for it never has the covering of lichen which is so characteristic of the Chaffinch's nest. We found the lining to consist invariably of an outer wall of white feathers (generally those of the Willow Grouse), with an inner layer of white willow-down. The nests were generally placed in the fork of a birch. The eggs we found resembled those of the Linnet rather than those of the Chaffinch, and were small for the size of the bird.

The Mealy Redpoll (*Linota linaria*) was very abundant, both in the birch-woods and in the willow-scrub; but by the time we arrived, the young birds were flying about with their parents in the trees.

In spite of the statement made in 'Yarrell' to the effect that the House Sparrow (*Passer domesticus*) has been observed at Kaaresuando, we searched most carefully all the time we were there, and failed to see one. As there are only twelve houses in the village, we should hardly have failed to see this bird. The natives said they had no birds round the house but White Wag-tails and Martins, and, in the winter, Snow Buntings.

We did not see any Pine Grosbeaks (*Pinicola enucleator*), but a Finn who when a boy used to collect for Wolley told us that he had taken a nest of this bird this year.

The Magpie (*Pica rustica*) has not at present come further up the valley than Kaaresuando (lat. 68° 26' N.), where a single brood was hatched out this year. We saw Hooded Crows a little further north, and Ravens all the way up the valley; but the two latter species are said to increase in numbers in "Lemming years."

We saw but one Woodpecker (*Dendrocopus minor*); the fir-growth is probably too sparse to encourage them so far north,—the northern limit of several species seems to lie between Muonioniska and Kaaresuando. The woodwork of the church in the latter village was bored with woodpeckers' holes.

The Cuckoo (*Cuculus canorus*) was heard on all sides.

Probably from the scarcity of thick woods, we did not come across a single Owl. We saw stuffed specimens of the Hawk Owl and Tengmalm's Owl, which with the Lapp Owl are said to be fairly numerous a few miles below Kaaresuando. In "Lemming years" the Snowy Owl, the Eagle Owl, and the Short-eared Owl are numerous on the higher grounds, but the Finns had not seen any Lemmings this summer, and consequently Owls and Hawks have been very scarce. We saw one Merlin, and a few Kestrels. A Finn who collects eggs at Kaaresuando had several clutches of eggs of the Goshawk, Peregrine, Rough-legged Buzzard, and of *Falco gyrfalco*. The Falcons, however, do not breed in any numbers, being found more frequently in the mountainous country round Kautokeino, in the Norwegian province of Finmarken. We saw a Peregrine working over the Uoma on July 4th, but apparently was not nesting. Goshawks are said to be fairly plentiful where there are trees large enough for building purposes.

We saw a good many Rough-legged Buzzards (*Buteo lagopus*) on the upper part of the river, especially close to Kilpis-järvi. On July 21st, while rowing across a small lake some five miles below Kilpis-järvi, we heard a sharp whistle from the cliffs above, which our Finns told us was the cry of a young Rough-legged Buzzard. We accordingly landed, and after a climb of half-an-hour reached the nest, which was built on a sheltered ledge above a great slope of boulders. Ten feet above it was the nest of the previous year, a substantial structure of twigs, some four feet in diameter; but the nest occupied was little more than a hollow scraped in the soil with a number of sticks scattered uselessly around. It contained one full-grown young one, with a good deal of downy fluff adhering to the feathers, and unable to fly, a young

one which had been dead some time, the remains of an Arctic Hare, and a Blue-headed Yellow Wagtail. One of the parent birds kept circling high above us while we examined the nest, uttering her mewing cry, which was answered by the sharper whistle of the young bird. This bird, which I now have at home in Surrey, escaped, but returned after two days, when I succeeded in whistling it down to alight on my hand.

The Great Grey Shrike occurs, but we only observed it once, and the Swift is said to occur on migration only, and then but rarely.

Both the Golden and White-tailed Eagles and the Osprey are said to have greatly decreased in numbers of late, but the former are of course more plentiful in "Lemming years."

We came upon a brood of Lesser White-fronted Geese on July 2nd in travelling down the rapids. The goslings were very tame, pecking at the mosquitoes on our hands. The old birds flew round and round in great excitement, uttering a harsh croaking. The Bean Goose (called by the Finns "Mountain Goose") occurs on the higher ground, as does also the Whooper (*Cygnus ferus*).

The Mallard is very rare, and we only saw one pair on June 30th.

The Shoveler (*Spatula clypeata*) is sometimes seen on migration.

The Pintail (*Dafila acuta*) is fairly common, and we caught some full-grown young ones on July 12th, easily distinguished by their long, graceful necks.

The Wigeon is one of the most abundant of ducks. It is an early breeder, and we began to see flights towards the end of our time. The Teal (*Querquedula crecca*) is nearly as common. We were surprised to find the Tufted Duck (*Fuligula cristata*) as common as it was; we saw quite a number of broods, and obtained a clutch of eggs from Kittainen. Below Kaaresuando the Scaup (*F. marila*) was fairly common, preferring small lakes with rocky shores to the river swamps. The flappers of this species may be distinguished by the broad bill with well-developed white nail, the yellow irides, and the greenish legs with black toes. The down plumage is much like that of a gosling.

Goldeneyes were very plentiful, especially lower down the river, where the Finns have put up numerous nesting-boxes for them to lay in.

We found the Long-tailed Duck (*Harelda glacialis*) fairly

numerous about Keinovuopio, some fifteen miles below Kilpisjärvi, and here we obtained a nest with seven eggs on July 1st. This was built in the reeds on the edge of a swampy pool, and was almost immersed in the water. The bottom of the nest, which resembled that of a Moorhen, was soaked, and there were only two down-tufts, of a dark-brown colour. We identified the female bird swimming near at hand. The eggs are small, and of a dark greyish-green.

The Common Scoter (*Edemia nigra*) was abundant, and we obtained two clutches of their eggs, which are of a beautiful creamy-yellow tint. The Finns also recognised the Velvet Scoter (*E. fusca*), which we did not see. Last year I found this species almost the commonest duck in Swedish Lapland, just below the Arctic circle.

The Goosander (*Mergus merganser*) is rare, but the Red-breasted Merganser (*M. serrator*) is extremely common, especially in the neighbourhood of rapids; its Finnish name signifies "rapid-bird." The Smew (*M. albellus*) is well known to the Finns, chiefly from the value of its eggs; there was no nest in the district this year, and it is always very rare.

The Willow Grouse, Ptarmigan, Hazel Hen, Black Grouse, and Capercailzie all occur, but game birds were scarce this year.

The Crane (*Grus communis*) seldom breeds so far north as Kaaresuando, though it does so in the Muunioniska district, where Wolley made his celebrated discovery of its nesting haunt.

The Dotterel (*Eudromias morinellus*) breeds on the higher grounds, and we observed it on July 23rd when crossing the frontier on our way back.

We found the Ringed Plover breeding in the neighbourhood of Kaaresuando on July 8th. The Golden Plover was one of the commonest birds on the Uoma, where its melancholy call was heard all through the night.

We obtained eggs of the Red-necked Phalarope (*Phalaropus hyperboreus*) from Kaaresuando, but did not often meet with the birds, which are known to the Finns as "Swimming Snipe." We did not meet with the Great Snipe (*Gallinago major*), but obtained eggs of the Jack Snipe (*G. gallinula*) from the Finnish side of the river at Kaaresuando, where there are some large marshes. We failed to meet with the Broad-billed Sandpiper (*Tringa platyrhyncha*); the skulking habits of this bird render it extremely

difficult to observe. We saw the eggs of this species, however, at Kaaresuando, and a Finn who was searching for us found two of the young in down.

We obtained eggs of Temminck's Stint, as well as the young in down. These birds frequent grass meadows in the neighbourhood of houses, and may be seen perched on stakes or trees uttering a faint *purre* resembling faintly the note of the Dunlin. The actions of the male bird (for we never saw the female) at the nest were very interesting. He would sit calling on a stake till he thought there was no danger, when he would fly down, hover above the spot, and then skim back to the post. After repeating this manœuvre several times he would drop in the grass, when his note changed to a quick continuous twitter.

The Ruff (*Machetes pugnax*) was very numerous in the marshes round Kaaresuando, where we obtained eggs. As one lay watching birds in the marsh they would keep passing and repassing over our heads uttering a low croak.

It seems the rule rather than the exception for the wading-birds on the Muonio to alight on trees or posts, and we noticed the following species continually perching, *viz.*, Ruff, Temminck's Stint, Common, Green, and Wood Sandpipers, Dusky Redshank, Greenshank, and Whimbrel.

The Common Sandpiper (*Totanus hypoleucus*) positively swarmed; they were quite as common as sparrows. We did not see many Green Sandpipers; but while we were at Kaaresuando some Russian Finns brought us some Sandpiper's eggs which they had found in a tree in an old nest of the Fieldfare; they said that the bird was like the Common Sandpiper, but had longer legs. We found the Wood Sandpiper (*T. glareola*) very abundant, and handled the young in down. The alarm note is a continual "tchick-tchick" or "giff-giff," generally uttered from the top of a stake or bush. The bird will often follow an intruder long distances to decoy him away from its young, which are of a greyish colour, with a conspicuous black stripe down the back. We watched one brood in particular for a long time on July 7th, close to Kaaresuando. Having caught the young we placed them first in one part of the marsh, then in another, lying down close to watch them. The male bird would run excitedly in and out of the tussocks, searching everywhere till he heard their feeble chirp. Then he would run towards them and settle down a yard

or two off, quickening his note to a continuous "giff-giff-giff." Then all the young had to tumble along laboriously (for they could hardly walk) till they reached the male bird, who tucked them safely under his wings; once or twice the female bird appeared on the scene for a minute or two, when both would soar in the air like drumming Snipe, and pitch down uttering a cry resembling their Finnish name "Leero." The Wood Sandpiper is known as the big "Leero," and Temminck's Stint as the little "Leero."

The Common Redshank (*Totanus calidris*) was only observed once, when we saw a pair on July 20th at Keinovuopio. The Finns did not know what they were. The Dusky Redshank (*T. fuscus*) was first met with about thirty miles above Kaaresuando, where they were common. By the beginning of July they were all over the marshes, whither they had brought their young from the fir-clad hills where they breed. We saw a good many eggs of this bird at Kaaresuando, which breeds early. The Finns call it "Reevat" from its cry, which, however, seemed to us to be better syllabled "vikla," the Finnish name for the Greenshank. The male in his sooty breeding plumage is a beautiful bird; but is not so much seen as the female. When approached they both soar, hover, and stoop above one's head, going through every conceivable movement in mid-air. Their note is then a clear "tjew," and this sometimes goes off into a "kick-kack, kick-kack" like a drumming Snipe when he is descending. The Greenshank (*T. canescens*) was fairly common along the river-side: when their young were approached they were very tame and confiding, and would balance themselves on the top of a post, or on the topmost twig of a bush, within a few yards of us. Their cry "tjeuty" is wonderfully resonant.

The Bar-tailed Godwit (*Limosa lapponica*) is known to the Finns, but we failed to meet with it.

The Whimbrel (*Numenius phaeopus*) was very common; and in one place, a barren, terrace-like plain which skirts the rapids for several miles, we found hundreds nesting. The Curlew (*N. arcuatus*) was not seen.

We were somewhat surprised to find the Arctic Tern nesting on the Uoma, and on small islands in the lakes, where they were fairly numerous, and were seen fishing everywhere. Their Finnish name "Tirro" almost exactly reproduces their cry.

The Black-throated Diver (*Colymbus arcticus*) was very numerous, and served us as a good weather prophet. We obtained two eggs of this species on June 29th from an island in a small lake called 'Tauki-järvi, near Keinovuopio. The Red-throated Diver (*C. septentrionalis*) was less numerous, but fairly common near Kaaresuando. We obtained one egg on June 16th from an island in the rapids called Karjalakoski.

THE MIGRATION OF BUTTERFLIES.

BY THE EDITOR.

IN the month of April last Mr. T. J. Mann, who was then sojourning in Ceylon for the benefit of his health, sent me a small collection of butterflies captured at Navanghena, with the following interesting note:—

“In this island, during the months of March and April, there is a vast migration of butterflies from N.E. to S.W. They appear not merely in hundreds, but in thousands, perhaps millions. This movement of countless numbers all going in one direction, as of set purpose, was first noticed this year about March 15th in the northern part of the island; and at a moist spot in the otherwise dry bed of a river, where they had apparently alighted to get moisture, the ground was quite white with their wings, reminding one of what one sees at home under the hawthorn trees when, after a sharp shower, the ground is strewn with may-blossoms. The migration, for such it appeared to be, commenced about 7 a.m., and lasted until noon, when there was a lull, or temporary cessation of flight, after which the movement recommenced, and the insects continued to pass on in swarms as before. I send you a series of specimens for identification; they will probably prove to be males and females of one species, and no doubt you will be able to name them, or get them named. I may add that large numbers of apparently the same butterflies were observed by friends one hundred miles out at sea to the S.W. of Ceylon.”

On receipt of this note I at once took steps to identify the species from the specimens sent; and with the aid of Mr. F. Moore's beautifully illustrated work on the Lepidoptera of Ceylon, and the assistance of Dr. A. G. Butler, who kindly

looked out specimens for comparison in the British Museum Collection, it was soon apparent that the insects captured by Mr. Mann were males and females of an Asiatic black and white butterfly tolerably well known to entomologists as *Catophaga galena*, Felder, having a general resemblance, both in size and colour, to our Cabbage Butterfly, and not unlike *C. lankapura*, Moore, excepting on the under surface, which is less yellow in the male, and pearly in the female instead of orange.

Phenomena such as that witnessed by Mr. Mann are not unrecorded, although little or no attempt has been made at explanation. Sir J. Emerson Tennent, in his 'Natural History of Ceylon,' says:—"At times the extraordinary sight presents itself of flights of these delicate creatures, generally of a white or pale yellow hue, apparently miles in breadth, and of such prodigious extension as to occupy hours, and even days, uninterruptedly in their passage—whence coming no one knows; whither going no one can tell." He adds in a foot-note:—"The butterflies I have seen in these wonderful migrations in Ceylon were mostly *Callidryas hilaria*, *C. alcmeone*, and *C. pyranthe*, with straggling individuals of the genus *Euploea*, *E. coras* and *E. prothoë*. Their passage took place in April and May, generally in a north-easterly direction. A friend of mine travelling from Kandy to Kornegalle drove for nine miles through a cloud of white butterflies which were passing across the road by which he went."

In this observation, and in the case mentioned by Mr. Mann, it will be noted, first, that the species recognised were not identical (although not distantly related), and, secondly, that the insects were travelling in precisely opposite directions, a circumstance which suggests that the direction of their flight may in some measure depend either on the prevailing wind at the time of the occurrence, or upon certain atmospheric conditions such as influence the migrations of birds.

Nor is it in Ceylon only that this phenomenon has been observed. In South America something of the kind was witnessed by Darwin, who has thus graphically recorded the observation in his 'Naturalist's Voyage in the Beagle':—

"Several times when the ship has been some miles off the mouth of the Plata, and at other times when off the shores of Northern Patagonia, we have been surrounded by insects. One evening when we were about ten miles from the Bay of San Blas,

vast numbers of butterflies, in bands or flocks of countless myriads, extended as far as the eye could range. Even by the aid of a telescope it was not possible to see a space free from butterflies. The seamen cried out "it was snowing butterflies," and such in fact was the appearance. More species than one were present, but the main part belonged to a kind very similar



CATOPHAGA GALENA, Felder, ♂ and ♀. Navanghena, Ceylon.

to, but not identical with, the common English *Colias edusa*. Some moths and Hymenoptera accompanied the butterflies; and a fine beetle (*Calosoma*) flew on board. Other instances are known of this beetle having been caught far out at sea; and this is the more remarkable, as the greater number of the *Carabidæ* seldom or never take wing. The day had been fine and calm, and the one previous to it equally so, with light and variable airs. Hence we cannot suppose that the insects were blown off the

land, but we must conclude that they voluntarily took flight. The great bands of the *Colias* seem at first to afford an instance like those on record of the migrations of another butterfly, *Vanessa cardui* (Lyell's 'Principles of Geology,' vol. iii. p. 63); but the presence of other insects makes the case distinct, and even less intelligible. Before sunset a strong breeze sprung up from the north, and this must have caused tens of thousands of the butterflies and other insects to have perished."

The late Mr. Bates, in his delightfully written book, 'The Naturalist on the River Amazons,' alluding (vol. ii. p. 227) to the number and variety of beautiful butterflies which he met with in his excursions round Ega, says:—"It was impossible to walk far without disturbing flocks of them from the damp sand at the edge of the water, where (as in the case noted by Mr. Mann) they congregated to imbibe the moisture."

Even as regards European Lepidoptera, something of the kind has been remarked in the case of a well-known butterfly, the Painted Lady, *Vanessa cardui*. In some years this species has been observed to be not only unusually abundant, but moving in numbers in one direction as if on migration. A very remarkable illustration of this occurred in the spring of 1879, when the Rev. H. Harpur Crewe, on his way to Spain and the Balearic Islands, saw countless numbers of this butterfly in the neighbourhood of Valencia and Barcelona from April 26th to 30th inclusive. A similar phenomenon was observed in the island of Minorca from May 1st to 3rd, and again in travelling by railway from Barcelona to Paris on the return journey. So remarkable was the abundance of *Vanessa cardui* at that time, not only in the countries just mentioned, but in England, France, and Germany, that Mr. R. McLachlan, to whom Mr. Crewe's observations were communicated, thought it worth while to collect and summarise all the particulars he could gain on the subject from English and continental naturalists. These details he published in the 'Entomologist's Monthly Magazine' (vol. xvi. pp. 49—51), from which the following may be quoted:—

"On June 15th, near Sèvres, great swarms appeared flying from S.S.E. towards N.N.W., the wind being S.S.W. At Strasbourg from the 3rd to 9th June a similar occurrence was observed. At Bischeim on June 7th, and also at Kehl, on the same day, myriads flew in the afternoon, at the former place from the S.W.,

at the latter from the S.E., so that it was thought the columns were not identical. At Angers a similar thing was observed on June 10th, the direction being from E, to W, against the wind,



THE PAINTED LADY, *Vanessa cardui*, ♂ and ♀.

which was not of much force. It was estimated that the number passing along a single street in one hour was from 40 to 50,000. At Würtemberg, from June 1st to 8th, an incessant migration from S. and W. towards N.E. and E. was remarked. In the

Canton Zurich, on June 7th, an immense swarm moved from S.W. to N.E., principally from 3 to 5 p.m.; this flight went persistently in one direction, only changing temporarily to avoid houses and trees. At Steyer in Upper Austria, on June 11th, surprising numbers flew ceaselessly from S.W. to N.E.; between 1 and 2 p.m. 90 to 110 per minute were counted in a space of about 100 paces, and the swarm was estimated to have been above rather than below 1,000,000."

These particulars, amongst others given by Mr. McLachlan, will suffice to show the very extraordinary nature of the migration of *Vanessa cardui* observed in that particular year.

Commenting upon the facts, Mr. McLachlan says (*l. c.*):—"There can, I think, be little doubt that all the swarms consisted of individuals that had hibernated; there can also be little doubt they were migrating, and that the column had become dispersed before remnants of them reached our shores, and other parts of the North of Europe. . . . Whence came they? Were they all bred the previous autumn? or is it possible the insect may be able to rest quiescent in the perfect state over a series of years until the accumulated numbers simultaneously wake up? The whole subject is surrounded with difficulties."

When exhibiting the Ceylonese specimens, forwarded by Mr. Mann, at a meeting of the Linnean Society on the 6th of June last, I remarked that these curious flights of butterflies could not be regarded as quite analogous to the migration of birds, which travel in opposite directions in spring and autumn; for the insects travel only in one direction and do not return, vast numbers perishing *en route*. The phenomenon resembles rather what has been observed of Lemmings,* Locusts,† and Dragonflies,‡ and may be explained as a sudden exodus from the birth-

* Crotch, Linn. Soc. Journ. xiii. pp. 27-34 (1878); additional note, p. 83. Further remarks, pp. 157-160 pl. xiii. Collett, *tom. cit.*, pp. 327-334. Somerville, Proc. Zool. Soc., 1891, pp. 655-658.

† See Layard, 'Birds of South Africa,' pp. 291, 314; and Andersson, 'Birds of Damaraland,' p. 264.

‡ Several of the larger species of *Libellula* occasionally migrate, but the phenomenon is of rare occurrence, and the circumstance which brings about such an uncommonly numerous development of the perfect insect must be very peculiar. See Weissenborn, on a remarkable migration of *Libellula depressa*, Mag. Nat. Hist., n. s., vol. iii. p. 516; and Hudson, on "Dragonfly Storms" (composed chiefly of *Æschna bonariensis*), 'The Naturalist in La Plata,' pp. 130-134. See also Gütke, on the migrations of *Libellula quadripunctata*, Heligoland, p. 89.

place, leading to a compensating reduction of the species after a season exceptionally favourable to its increase. In this view Col. Swinhoe, whose extensive acquaintance with the Lepidoptera of India and Ceylon is well known, has expressed his concurrence. But since these remarks were made, some additional and most interesting information has come to light, and from an unexpected source. Herr Gätke, who for fifty years has devoted himself to a study of the migratory birds which visit Heligoland, has published, in a bulky volume, the results of his observations, and an English translation of the German text has just been issued.* In this volume will be found some extremely interesting observations on the migration of butterflies, from which the following is an extract:—

“That Lepidoptera during their more extended flights are subject to the same meteorological influences as birds, I have been convinced by the experience of many nights in July, during which I have caught numerous nocturnal Lepidoptera not belonging to our insect-fauna, the weather of these nights being invariably such that, if it had occurred a few weeks later, it would have conducted hither innumerable Wheatears. It has, in fact, occurred repeatedly that Lepidoptera, especially night-flying species, have passed over this island in countless swarms at the time of powerful bird-migrations. Thus, during the night of the 25th of October, 1872, thousands of *Hybernia defoliaria*, mixed with smaller numbers of *H. aurantiaria*, passed over the island in the company of large numbers of Larks. And again, in the night of the 11th of October, 1883, during which an unusually strong migration of all the species of birds due at that time took place, this was accompanied by the appearance of very large swarms of the same species of *Hybernia*.

“White Cabbage Butterflies, the Black Arches, *Psilura monacha*, and also *Libellulidæ* (*Libellula quadripunctata*) have been seen to pass here in migratory flights of astonishing proportions, though even these do not come up to those of *Plusia gamma*, which on repeated occasions have occurred in numbers of which it would be quite impossible to form any

* ‘Heligoland as an Ornithological Observatory: the result of fifty years’ experience by Heinrich Gätke.’ Translated by Rudolph Rosenstock. Roy. 8vo. Edinburgh: David Douglas. 1895.

conception. Thus, during the nights from the 15th to the 19th of August, under the favourable conditions of a south-easterly wind and fair weather, a considerable migration of birds took place. On each of these nights, from 11 p.m. to 3 a.m., the small *Noctuæ* above referred to were seen at the lighthouse, passing from east to west in undiminishing numbers, like the flakes of a dense snowstorm. These small creatures also manage to cross the North Sea in safety, for they often arrive on the east coast of England suddenly, and in such remarkable numbers that we can only believe them to be immigrants. In fact, as my friend Mr. John Cordeaux informs me, an enormous accumulation of these insects actually took place at a time corresponding to that of the above observations." (P. 117.)

Further on Herr Gätke writes:—

"Both the theory of inheritance as well as that of tradition are quite untenable in regard to the periodical migratory phenomena of other animals endowed with the power of flight, such as beetles and nocturnal Lepidoptera. Among the latter the migrations of *Plusia gamma* furnish in Heligoland excellent material for observation. During their autumn migrations these small moths travel from Slesvick-Holstein to England, across the North Sea, a breadth of water of four hundred miles in extent. They pass this island in enormous swarms, resembling, as seen from the lighthouse, a dense snowstorm driven by a light breeze. Thus, according to an entry in my journal for 1882, on the night from the 15th to the 16th of August, with a very light south wind, a powerful migration of birds occurred:—'From 11 p.m. to 3 a.m. millions of *Plusia gamma* were travelling from east to west, like a dense snowstorm.' 'Again, on the nights of the 16th, 17th, and 18th, large numbers of *P. gamma* passed the island, the migration commencing each evening at 11 o'clock. On the 19th the wind was south-east, the weather fine and calm. In the evening the sky became over-cast, and a strong migration of birds took place. From 11 p.m. until 2 a.m. thousands of *P. gamma* were again seen.' A thunderstorm, with high winds, subsequently put an end to the migration. These little insects also follow an east-to-west course of migration, and they adhere to it with as much steadiness and precision as the different migratory hosts of birds which are observed here. That they, too, accomplish their journey in safety is shown by the enormous swarms of them which frequently cover

the east coast of England, and which can only be explained as the result of an immigration. Besides *P. gamma* large numbers of *Gastropacha neustria*, *Agrotis graminis*, and other species, are represented in such migratory swarms. It has been suggested that these insects are attracted by the light of the lighthouse, and that, consequently, it is only around the latter that they are seen in such quantities; this, however, is contradicted by the migrations of *Hybernia defoliaria* and *H. aurantiaria*, these insects sometimes making their appearance during strong migrations of Larks in October, when large numbers of them may be found in the course of the night, as well as on the following morning, from one end of the island to the other. Now it is quite impossible that these moths should be able to collect experiences of any kind during this single migration of their life, which, moreover, is performed in the darkness of night across a wide expanse of water; and even if they did these would be perfectly useless, for these migrants die shortly after their autumn migration without having produced further offspring to which they could commit their experiences, either by hereditary transmission or by personal instruction."

On the subject of migrating Dragonflies, Herr Gätke remarks:—

"Another very peculiar phenomenon, also intimately connected with thunder-storms, is the regular but temporary appearance, in millions, of the large Dragon-fly (*Libellula quadripunctata*) before such disturbances. Countless swarms of these insects make their appearance all of a sudden during the calm sultry hours preceding the catastrophe, while thunder-clouds gather on the horizon, and, heaped upon each other, project into the blue ether beyond, like so many giant mountains of snow.

"The direction whence these insects proceed cannot be ascertained, nor do they arrive in swarms or companies, but solitary individuals or scattered groups probably congregate on the spot in one vast throng. The assembling individuals or groups must, however, follow each other in very rapid succession, for in a short time the face of the cliff, still illumined by the sun, all the buildings, hedges, and dry twigs on the island, are covered with them. Nor is it necessary for the occurrence of this phenomenon that the storm should actually discharge itself over Heligoland, or even in its immediate neighbourhood, but

only that the thunder-clouds extend over about two-thirds of the whole expanse of sky as measured from the horizon to the zenith. The insects vanish as suddenly as they appear, so that hardly one of them is discoverable on the following morning. It is not known whether they proceed further west, though this is probably the case. It is certain, at any rate, that they do not remain here, otherwise one would undoubtedly find them lying about dead after the heavy rain of a thunder-storm."

Herr Gätke has expressed his conviction (*op. cit.* p. 116) that Lepidoptera during their more extended flights are subject to the same meteorological influences as birds, and it is curious that in regard also to Dragon-flies it should have been observed by himself (p. 89) and by Mr. Hudson (*op. cit.* p. 131), of different species in two very different quarters of the globe, that these swarms of insects suddenly make their appearance immediately *before* some atmospheric disturbance, such as a heavy thunder-storm or a high wind.

It is observable also that while superabundance of life, in the case of the Lemming and Locust, requires to be checked by the intervention of certain natural enemies—the former being attacked by Owls, Hawks, and Buzzards, the latter by Pratincoles and Storks*—no such interference has been observed in the case of Butterflies and Dragonflies, more lowly organized creatures, which go to their destruction unharassed, yet driven as it were by some inherited impulse which they are apparently unable to withstand.

From the incomplete nature of the statistics at hand it is not possible to draw any definite conclusions as to the cause of the migrations observed; but taking the case of *Vanessa cardui* as furnishing the greatest number of recorded observations, the following statements may be taken as fairly correct, or at least as warranted by the evidence:—

(1) The migration does not take place annually, but at irregular intervals, and only in those years in which there has been an abnormal abundance of the species, or failure of the food plant; when there is, so to say, a surplus population to be got rid of.

* *Pratincola nordmanni* and *Ciconia alba*, known respectively to African colonists as the "Small" and "Great Locust-birds."

(2) The sexes do not migrate separately as is the case with certain birds.

(3) Butterflies do not invariably fly with or before the wind. They have been observed passing from S.S.E. to N.N.W., with the wind at S.S.W., and even going due W. with the wind blowing from that quarter. This negatives the suggestion that they are irresistibly carried away by a current of air.

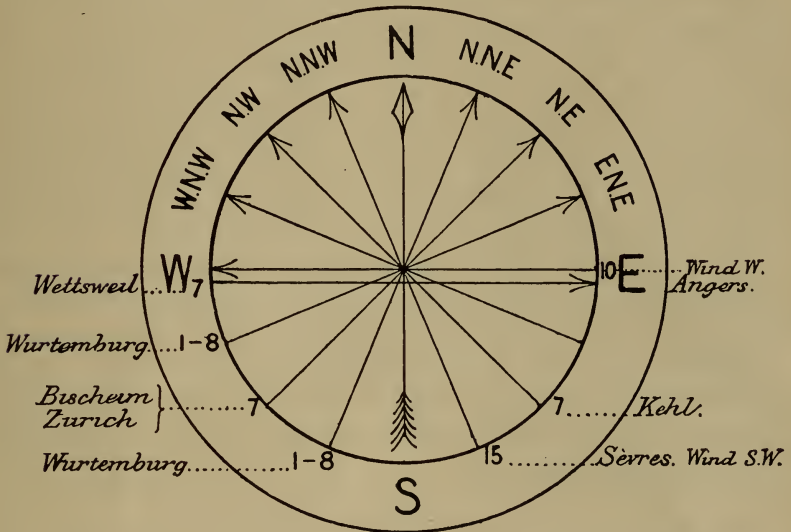


DIAGRAM TO SHOW PREVAILING DIRECTION OF MIGRATION OF *Vanessa cardui*.

(4) The general direction of the spring migration (at least in the case of *V. cardui*) is northerly; that is to say, not due north, but some points E. or W. of N., as shown in the accompanying diagram. In no instance, so far as the records show, have any flocks been observed at that season of the year going south, or in any southerly direction.

(5) There is no return journey in autumn in a direction opposite to that taken in spring.

There are other points upon which no certain information is at present available. For example, we have yet to learn whether butterflies have a sense of direction—as is probable, not merely from what has been above stated, but from their going towards particular flowers, and making choice of particular food-plants upon which to deposit their eggs—or whether in the course of

their migrations they are merely actuated by an inherited and uncontrollable impulse. Taking it for granted that thousands of individual butterflies perish during these periodical migrations, while a certain number reach their destination—or at least arrive at some destination where they may rest, recuperate their strength, and continue their species—do they in point of fact discover some suitable food-plant for the nourishment of their larvæ? If so, when eventually the pupæ are transformed to perfect insects, do the latter in their turn migrate as did their progenitors? and towards the north? in which case some limit must eventually be reached, to pass which would prove fatal to the species? In the alternative, all the migratory hosts must perish, and the perpetuation of the species must be left to those individuals which at the period of the general exodus do not quit the land of their birth. But here again we stand in need of facts. Are any individuals left behind at the period of migration? or do the female insects previous to their departure take care to deposit their eggs, and thus ensure the foundation of a future colony?

Those who reside in or visit localities wherein these curious migrations are observable would do well to enquire into the subject more closely, with a view to clear up some of the difficulties which are here suggested.

NOTES AND QUERIES.

MAMMALIA.

Spread of the Roe-deer in S.W. Scotland.—It is rather surprising, now that Roe-deer are so plentiful in the district, that they are so strange and unfamiliar to the eye of most folks. It is only about twenty years, or a little more, since they reappeared in the south-western counties after a very long absence, but now they are found all over the district, and some copse-woods contain them in comparatively large numbers. I have seen no less than four of these pretty little deer gambolling together within twenty yards of the public road at a Troqueer locality not much over a mile from the end of the New Bridge.—ROBERT SERVICE (Maxwelltown, Dumfries, N.B.).

White Hedgehogs.—On August 11th, while going round the coverts to look at some vermin traps, I found in one of them a Hedgehog that was quite white. Never having seen a white one before, I think you might

be glad to hear of it.—THOMAS HARDBOTTLE (Gamekeeper, Kilburn, Easingwold).

[White Hedgehogs no doubt are occasionally met with, but not very often reported. Charles Waterton, whose name is familiar to naturalists, once had a family of milk-white Hedgehogs in his park at Walton Hall, near Wakefield (Zool. 1866, p. 195). Mr. J. O. Harper, of Norwich, communicated the fact that he had obtained a white Hedgehog in the parish of St. Faith's, near Norwich, in October, 1850, and added that on dissection he found the nerves in connection with the muscles for the contraction of the skin to be greatly diseased (Zool. 1851, p. 3022). In December, 1878, another white Hedgehog was caught in Wrest Park, Bedford. See 'Zoologist,' 1879, p. 172.—ED.]

London Rats crossing the Thames.—A most remarkable sight was witnessed during the burning of the large grain warehouse near Blackfriars Bridge on August 31st last. When the fire was at its height a great stir was noticed in the waters of the Thames, which for some time could not be accounted for. Before long, however, the spectators on the embankment discovered that it was caused by immense numbers of rats which had been driven by the heat from the burning building. They appear to have left the place *en masse*, for they were all gathered together and made their way across the water in one crowd. Unfortunately for the rats, but fortunately for the dwellers on the opposite side of the river, they could find no landing-place, and most of them found a watery grave. Rats, although essentially land animals, are not without the power to swim, but, like all other animals which take to the water by force of circumstances, and not from choice, they are not long before they become exhausted. It is probable, therefore, that those which swam across the river and could find no landing-stage on the embankment were too exhausted to return to the Surrey side, and so perished.

Whiskered Bat in Derbyshire.—Through the courtesy of Mr. G. F. Gee, I have been able to examine a Whiskered Bat, *Vespertilio mystacinus*, which was killed last June, in broad daylight, at Cromford.—CHARLES OLDHAM (Romiley).

Common Seal at Scarborough.—On August 24th a Common Seal, *Phoca vitulina*, was shot at Scalby Ness, in the North Bay, Scarborough. The animal, which was a young male of very pale colour (almost entirely without the usual dark dappling on the back), had been left by the tide in a pool on the rocks, and when seen was making the best of its way back to the open sea.—WILLIAM J. CLARKE (44, Huntriss Row, Scarborough).

BIRDS.

Migration of Pied Wagtails.—August 15th. The Wagtails are beginning to assemble on my lawn daily, as they do every year about this

time. I suppose they are on their way to southern climes. Great numbers of them are to be seen on some mornings at this season in the park here. This continues for about a fortnight or three weeks, when nearly all depart.—J. G. HAMLING (The Close, Barnstaple).

Quails in Nottinghamshire.—There are three pairs of Quail evidently nesting close to the house here,—two pairs in clover and one in barley. Formerly we often shot Quail in September; now they are not often seen, and it is several years since I flushed one in the shooting season. Common Sandpipers had returned here from their breeding-places by 24th of July.—J. WHITAKER (Rainworth, Mansfield, Notts).

White-fronted Goose in St. Kilda.—It may perhaps interest Mr. Steele Elliott, whose notes from St. Kilda are printed in the last number (p. 281), if I mention the White-fronted Goose (*Anser albifrons*) as a recent addition to the fauna of that island. An adult male of this species, a solitary straggler, was shot on St. Kilda in June of the present year; and, as it was a handsomely-marked bird, I had the pleasure of sending it to Mr. W. Eagle Clarke for the collection in his charge at Edinburgh. *Apropos* of *Fulmarus glacialis*, when I visited St. Kilda a few years ago to obtain the downy young of this species, I found that the nestlings appeared to be from three days to a week old upon the 10th of July. This year some young Fulmars were sent to me from St. Kilda during the first week of August. The largest had lost a great deal of the nestling down, and they had all begun to develop their quills. I may add that a very pretty Pied Puffin was sent to me from St. Kilda this year. The whole of the upper parts are varied with white feathers in this bird. Of course such varieties of *Fratercula* have been often recorded, but they are seldom to be seen in public museums. This bird is being mounted for the Carlisle Museum.—H. A. MACPHERSON (Carlisle).

[We received a notice of this occurrence from Mr. Steele Elliott, but too late for insertion in the last number, which was then in the press.—ED.]

Water Pipit at Tetney Haven.—On April 5th I shot a Pipit at Tetney Haven on the Lincolnshire coast, which at the time I supposed to be the Scandinavian form of *Anthus obscurus* in summer plumage, but subsequently Mr. Cordeaux, having seen the skin, pronounced it to be an example of *Anthus spipoletta*; and Professor Newton and Mr. Dresser, who were kind enough to examine the specimen, concurred in this opinion. This is the first occurrence of this species in Lincolnshire.—C. H. CATON HAIGH (Aber-Iá, Penrhyndeudraeth, Merionethshire).

Period of Incubation with the Shag.—When visiting a nesting haunt of the Shag or Green Cormorant in Shetland on May 6th last I was somewhat surprised to find that most of the nests had their full complement of eggs, apparently a good deal incubated. A few, indeed, contained young,

some of which must have been fully a week old. This is eight days earlier than on the Saltees, as recorded by Mr. Ussher (Zool. 1890, p. 436). Taking the incubation period for the Shag as a month—that of the Cormorant being twenty-eight to twenty-nine days, according to Mr. Evans “On the Incubation Period of Birds” (‘Ibis,’ Jan. 1891)—some of the eggs at this locality must have been laid by the end of March. This is perhaps abnormally early, yet the date given, May and June, in the lately published book on Oology by C. Dixon, is far too late, and refers undoubtedly to second layings. Though I have seen many hundreds of Shags’ nests, yet I have never till this season found one containing more than three eggs. This year, however, one with four eggs was noted. Another nest contained no less than seven, but these had evidently been laid by different birds, three of them being of one type, and probably belonging to the rightful owner of the nest, while the other four were all different and in different stages of incubation. Other nests in the immediate vicinity of this one contained only one egg apiece. It is reported by the Shetland fishermen that the “Scarf,” as it is there called, has greatly increased of late years. The bird is bitterly hated by them, and used to be destroyed to some extent at the nesting period, but this has of course been now stopped. The colony of Green Cormorants on the “Horse of Burrasoe,” Yell, certainly numbers over 2000 pairs at a moderate estimate.—HAROLD RÆBURN (31, Buccleuch Place, Edinburgh).

Arctic Tern and Common Gull breeding in Shetland.—In the loch of Grumnavoe, in the mainland of Shetland, there is a small island which rises several feet above the water, and is densely clothed with a broad flag-like vegetation. On this island, which I visited on June 24th last, I found a colony of the Arctic Tern breeding in company with the Common Gull and other species. Most of the Terns’ nests were situated on the grassy upper tract, and each was formed of pieces of dry flags placed together without any tidiness or compactness, but in sufficiently thick layers to keep the eggs dry. This note will be of interest in view of Dixon’s statement (‘Nests and Eggs of British Birds,’ p. 307) concerning the nidification of the Arctic Tern, that no lining is ever used.—ROBERT GODFREY (46, Cumberland Street, Edinburgh).

Avocet in Kent.—During the last week of August an Avocet, *Recurvirostra avocetta*, was shot not far from the North Foreland, and was brought to me the following day. It was a bird of last year, in very good condition. The shooter reported that there were three in company, only one of which he secured.—W. OXENDEN HAMMOND (St. Albans Court, Wingham).

The Marsh Tit in Dumfriesshire.—About 1840, according to the late Sir William Jardine, Marsh Tits were not uncommon in Dumfriesshire, while Coal Tits were scarce. The very reverse is the case now-a-days;

indeed until within the last few years I had never seen the Marsh Tit within a considerable radius of Dumfries. In one or two spots of Upper Nithsdale, and in parts of Annandale, a pair or two were usually located. The species seems to be gradually spreading again, and I have observed three pairs in different places in the Stewartry side of the Nith.—ROBERT SERVICE (Maxwelltown, Dumfries, N.B.).

BATRACHIA.

Natterjack Toad in Dumfriesshire.—Few people are aware that, so far as Scotland is concerned, we in this district have a monopoly of the Natterjack, *Bufo calamita*. Some time ago I was applied to by a friend at a distance to procure for him a few Natterjacks. For this purpose I repaired to the shore below Kirkconnell Lea, and searched for over three hours, but for some reason or other failed to turn up a single specimen. They are usually found under stones just above high-water mark. Failing here, I thought of Southernness, the other locality where these curious little Toads are sometimes got; and there I found them at once in the usual situation, and procured the required number. They are found all round the shore from the Lighthouse to the head of Gillfoot Bay. They are curious little fellows, smart and lively, singularly flattened in aspect, and with more “life” about them than the Common Toad appears to have. The yellow stripe down the back, and brown warts, give them quite an ornamental look. It has never been explained why they should be found nowhere else in Scotland than at these two localities. In England also it shows a similar sporadic distribution.—ROBERT SERVICE (Maxwelltown, Dumfries, N.B.).

[This confirms an observation made more than fifty years ago by Sir William Jardine, and communicated by him to Bell for his ‘History of British Reptiles.’ It is interesting to note that Southernness was then as now a recognized haunt of this somewhat local species.—ED.]

MOLLUSCA.

Helix rotundata, M. (sinistrorsum, Taylor).—While searching in a garden here on Aug. 24th I found a reversed specimen of *Helix rotundata*, Müller. The shell measures about 5 m. across. The colouring is normal, the embryonic whorl being dull grey and without striæ, as usual; the intermediate whorls dark brown and the body whorl horn-colour, blotched with reddish brown. As the animal is alive I hope to be able to rear it to its full size.—ALFRED SICH (Chiswick).

ERRATA.—P. 305, line 19 from top, for “Carmarthenshire” read “Carnarvonshire;” line 3 from bottom, for “DOBBRE” read “DOBBIE.”

NOTICES OF NEW BOOKS.

The Royal Natural History. Edited by RICHARD LYDEKKER: with Preface by P. L. SCLATER. In six volumes; illustrated with 72 coloured plates and 1600 engravings. Vols. II.—IV. London: F. Warne & Co. 1894–95.

SINCE our last notice of this work (Zool. 1894, p. 316) considerable progress has been made in the issue of parts, the punctual appearance of which every month is most commendable. Volumes II. and III. have been completed, and four parts (19—22) of Vol. IV. are already issued. The ground covered so far by the author comprises the whole of the Mammalia (in fifteen parts) and a considerable portion of the Birds (parts 16 to 22, the last issued).

As regards the classification, Mr. Lydekker divides the class Mammalia into eleven orders, which are dealt with in the following sequence:—

1. PRIMATES . . Apes, Monkeys, and Lemurs.
2. CHIROPTERA . . Bats.
3. INSECTIVORA . . Insectivorous Mammals.
4. CARNIVORA . . Carnivorous Mammals.
5. UNGULATA . . Hoofed Mammals.
6. SIRENIA . . . Manatees and Dugongs.
7. CETACEA . . . Whales and Porpoises.
8. RODENTIA . . Rodents.
9. EDENTATA . . Sloths and Anteaters.
10. MARSUPIALIA . . Pouched Mammals.
11. MONOTREMATA . . Egg-laying Mammals.

It is not to be supposed that all these groups are separated from one another by differences of equal importance; for, as Mr. Lydekker points out, No. 10 differs from the preceding groups by characters of far more importance than do any of the preceding nine from one another, while members of No. 11 differ fundamentally from the first nine groups, but almost as markedly from No. 10.

In the first chapter the chief characteristics of the class Mammalia are pointed out, those of the orders being reserved for subsequent treatment in their proper place. In view of the great interest attaching to the natural history of the Anthropoid

Apes, we should have expected to find more particular reference to the literature of the subject; not a complete bibliography, of course, for that would entail too much labour and occupy too much space, but a selection of titles of the more important books or essays which have been published, with proper references to the periodicals in which the essays are to be found. This would be extremely useful to a reader desirous of pursuing the subject in greater detail than the space at Mr. Lydekker's disposal has enabled him to do.¹

This remark applies forcibly to the very short section on Fossil Apes (p. 57), in which the author, referring to the remains of a fossil Chimpanzee found in Northern India, in rocks belonging to the Pliocene or later division of the Tertiary period, draws the conclusion that India was the original home of the ancestors of all the large man-like Apes of the present day, and that from this centre their descendants have gradually dispersed to the eastward and south-westward. We have thus, he considers, an easy explanation of the present peculiar geographical distribution of the various groups of large man-like Apes now existing. Moreover, there is sure evidence, he says, that at an earlier part of the Tertiary period, known as the Miocene Age, at least one species of Anthropoid Ape (*Dryopithecus*) inhabited Western Europe, its remains having been found in France. Mr. Lydekker, as an accomplished palæontologist, could of course give chapter and verse for these statements, but the uninformed reader would have been glad to have, if only in a brief foot-note, a reference to the particular memoirs in which the discovery of these fossil remains in India and France may be found detailed.

In the order which includes the Monkeys the number of species is so large that their classification and diagnosis is a very troublesome matter, and we do not think that Mr. Lydekker has made it quite so clear as he might have done. For example, if in his prefatory remarks he had pointed out the chief characteristics which serve to distinguish the old world species from the new, and had then split up these sections into smaller groups, mentioning the peculiarities of each, his subsequent treatment of the species would have been not only less confusing to the reader, but would have rendered it very much easier to determine the name and systematic position of any particular species that might come under the reader's notice. His account of the Barbary

Ape (*Macacus inuus*), or, as he prefers to call it, "the Magot," following the example of Buffon, is very interesting in regard to the particulars respecting its lingering existence in Spain, especially on the Rock of Gibraltar, where it continues to be protected, having been originally imported thither by the Moors from Barbary.

Amongst the Lemurs and their allies, of which a considerable number are figured, we find some of the best illustrations, *Lemur varius*, *Hapalemur griseus*, *Chirogaleus furcifer*, being especially well executed. The Potto asleep (p. 233) is drawn in a characteristic attitude and nicely engraved. In these examples the chief faults of the printer, too much ink and too much pressure, have been fortunately avoided. The same cannot be said in the case of some of the Bats. The Greater Horse-shoe Bat, for example, figured on p. 263, is made to look nearly black, whereas it is naturally one of the very palest of its kind. The wing-membrane, instead of being pale and delicate and semi-transparent, is literally "as black as ink," which gives an appearance of solidity quite unreal. So with the Barbastelle (p. 271), Daubenton's Bat (p. 284), and even the Common Pipistrelle (p. 274), of which specimens might easily have been procured as a guide for colour, or rather tone. Illustrations of Bats in general works on Zoology seem to be always a stumbling-block to artists, engravers, and printers. They are scarcely ever correctly drawn, and as seldom well printed. Mr. Lydekker, in this order of Mammals, would have done well to have discarded as many as possible of the old blocks and to have prevailed on the publishers to substitute something newer and better.

The order Insectivora, it seems to us, has been somewhat scantily treated, both in regard to the selection of the species described, and to the illustrations, of which we do not find more than a score. In the case of the Water Shrew, of which a very inadequate illustration is given (p. 328), the figure does not accord with the description given in the text. It is said to be of the natural size, but is considerably less, and is black beneath where it should be white.

These may seem trivialities in the way of criticism; but if such faults as we have indicated are to be observed in the case of species with which we are well acquainted and of which specimens

are easily procurable, it lessens our confidence in the accuracy of those of which we know little, and which may or may not be as faultily delineated.

In the order Carnivora we are sorry to find that the account of the Lion and Tiger alone occupy some forty pages of text. Half of this space at least might have been saved for the consideration of less-known species. Few wild animals are now better known than the Lion and Tiger; every book on travel and sport in Africa and India teems with information of some sort about them; every trait in their character, every peculiarity of habit must surely by this time have been described over and over again.

We should have been content with brief descriptions of species, accurate tables of measurement or weight, outline of geographical distribution, and references to reliable sources of information for further details on special points.

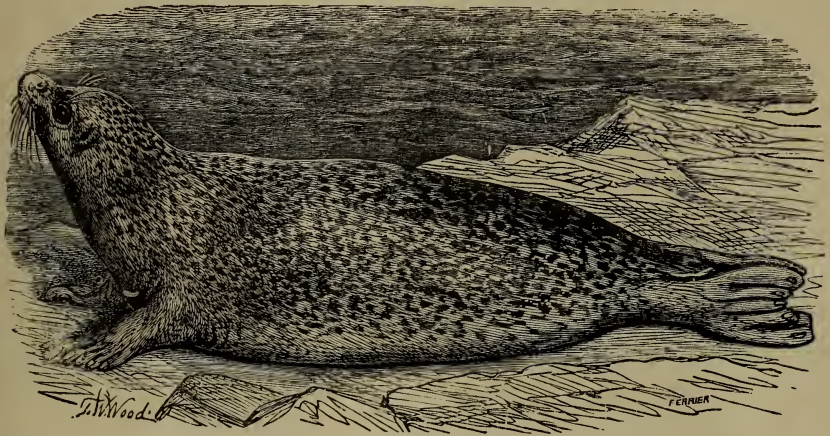
There is perhaps no point on which there has been so much exaggeration and misrepresentation as the measurement of Tigers. The greatest lengths recorded in the Badminton volume on Big-game Shooting (section India) have been recently severely criticised by a sportsman who, having shot no less than 83 Tigers in the course of his experience, is well qualified to express an opinion on the subject. His remarks, which appeared in 'The Field' of 17th August last, should be read *in extenso* by those who are interested in this subject. From the reliable statistics given by him it is clear that Mr. Lydekker must be in error when he states (p. 375) that "unusually fine specimens will reach, or even slightly exceed, a length of 12 feet; 12 feet 2 inches being apparently the maximum dimensions ascertained with any approach to accuracy." These dimensions evidently must have been ascertained from the skin and not from the dead animal. Those who have had experience in flaying wild animals are well aware that a dressed skin will easily stretch so as to measure a foot or two more than it did before removal.

On the subject of the European Wild Cat and its allies Mr. Lydekker has some interesting remarks, but in speculating on the ancestry of the Domestic Cat in different countries he has evidently omitted to consult De Blainville on the osteology of the mummied cats from Egyptian tombs, and an essay by the present writer on "The Origin of the Domestic Cat," which

formed the subject of one of the Zoological Society's 'Davis Lectures,' might have furnished some useful hints.

Through the courtesy of the publishers, Messrs. Warne & Co., we are enabled to reproduce half-a-dozen of the illustrations, selected here and there from parts before us.

The figure of the Seal (*Phoca vitulina*) furnishes a characteristic attitude of an animal which, though common enough on many parts of the British coast, and occasionally found in rivers some distance from the sea, is seldom seen by the majority of



THE SEAL, *Phoca vitulina*.

people except in museums and zoological gardens. The account given of it by Mr. Lydekker is brief, though he conveys a good idea of its geographical distribution, which is very extensive.

In the illustration of the European Wild Boar we recognise the master hand of Joseph Wolf, and regret that we do not find more of his work in the present volume. As a former denizen of English forests the Wild Boar is an animal to which a peculiar interest attaches, since it forms a connecting link, as it were, between past and present—between those extinct creatures whose former existence in our country is known to us only by the discovery of their fossil remains, and those which are still living at the present day. As a beast of the chase he has been renowned from the earliest times, and still continues to test the prowess of sportsmen in France, Germany, and other parts of the world, including India, where "Hog-hunting" (or

Pig-sticking, as it is also termed), in the opinion of many English officers and civilians who have tried it, forms the very *acmé* of sport.

In the standard work of Bell on 'British Quadrupeds, including the Cetacea,' we have before now (p. 20) had occasion to regret the unsatisfactory nature of some of the illustrations, notwithstanding the excellence of the engraving.



THE WILD BOAR, *Sus scrofa*.

The figures of the Killer or Grampus (*Orca gladiator*) and of Risso's Dolphin (*Grampus griseus*), borrowed from a memoir by Mr. True (Bull. U. S. Nat. Mus. 1889), are here reproduced to show the effectiveness of "process-blocks" from drawings in black and white, when the surface of the animal to be represented is perfectly smooth and does not, as in the case of furred animals, lend itself to the treatment of line engraving.

The section devoted to Birds, in the 'Royal Natural History,' commences with Volume III., Part 15, and we turn to it with some curiosity to ascertain the scheme of classification adopted. On no subject is there greater diversity of views among zoologists

than with regard to the classification of Birds (see Zool. 1894, pp. 469-470), owing, no doubt, in a great measure to the difficulty of determining what features should be regarded as of primary importance.



THE KILLER OR GRAMPUS, *Orca gladiator*.

Mr. Lydekker has thought it "advisable," as he tells us (p. 303), "in a popular work of the present nature to revert to a



RISSE'S DOLPHIN, *Grampus griseus*.

modification of a scheme proposed some years ago by Dr. Sclater. Including certain extinct forms, Birds, according to this scheme, may be divided into twenty-five groups, of which the first twenty-two may be reckoned orders — such orders, be it understood, being for the most part far less distinct from one another than are those of Mammals.

1. PASSERES . . . Perching Birds.
2. PICARIÆ . . . Woodpeckers, Cuckoos, Hornbills, &c.
3. PSITTACI . . . Parrots.
4. STRIGES . . . Owls.
5. PANDIONES . . . Ospreys.
6. ACCIPITRES . . . Eagles, Falcons, Vultures, &c.
7. STEGANOPODES . . . Pelicans, Cormorants, Gannets.
8. HERODIONES . . . Herons and Storks.
9. ODONTOGLOSSI . . . Flamingos.
10. ANSERES . . . Ducks, Geese, and Swans.
11. PALAMEDEÆ . . . Screamers.
12. COLUMBÆ . . . Pigeons, Dodo, and Sandgrouse.
13. GALLINÆ . . . Fowls and Game Birds.
14. FULICARIÆ . . . Rails and Coots.
15. ALECTORIDES . . . Cranes and Bustards.
16. LIMICOLÆ . . . Plovers, Curlews, Snipe, &c.
17. GAVIÆ . . . Gulls and Terns.
18. TUBINARES . . . Petrels and Albatrosses.
19. PYGOPODES . . . Divers, Auks, and Grebes.
20. IMPENNES . . . Penguins.
21. ODONTORNITHES . . . Toothed Birds (extinct).
22. CRYPTURI . . . Tinamus.
23. STEREOORNITHES . . . Patagonian Flightless Birds (extinct).
24. RATIÆ . . . Ostriches, Emus, &c.
25. SAURURÆ . . . Long-tailed Birds (extinct).

As, according to Mr. Lydekker, the number of species of existing birds is considerably over 10,000, the space at his command has necessitated a much briefer treatment of the class than is the case with the Mammalia, and he seems to have made a fairly good selection of the families and genera to be noticed. We see no justification, however, for the remark that "for the anatomy of the soft parts of birds the reader must be referred to other works." This part of the subject ought surely to have been dealt with in the introduction to the section.

As a specimen of the illustrations of bird-life given in this volume we are permitted to reproduce the figure of the Pigmy Parrot of New Guinea (*Nasiterna pygmæa*), and we have selected this not only on account of the excellence of the tone, but because the bird has been drawn life-size, the total length being about three inches, which for a Parrot is, of course, remarkable.

The last of our illustrations, the Passenger Pigeon (*Columba migratoria*), has been chosen as a very pleasing example of Mr. George Lodge's engraving, and as representing one of the

rarest of North American wanderers to the British Islands. Mr. Lodge is one of the very few artists who can engrave his own blocks, and who, knowing exactly the effect which is required to be produced, runs no risk of misinterpretation by entrusting the



THE PIGMY PARROT, *Nasiterna pygmæa*.

block to other hands. In the Pigeon here figured we have an excellent contrast between the soft delicate plumage of the bird and the rugged bark of the pine tree on which it is well posed.

With this observation we must bring our notice to a close. So far as the work has proceeded it reflects the greatest credit on the industry of the author and the enterprise of the publishers.

The more we have looked into the work the more we have

marvelled at the price at which it is being issued. Seeing that each part contains about one hundred pages of letter-press, well printed, and on good paper, fifty or sixty engravings, and two coloured plates, we should consider it cheap at five



THE PASSENGER PIGEON, *Columba migratoria*.

shillings a part, whereas the actual cost of each number is one shilling net.

It ought to have an enormous circulation, and, as an aid to the diffusion of zoological knowledge, we hope it may.

THE ZOOLOGIST

No. 226.—October, 1895.

THE ORNITHOLOGIST IN HELIGOLAND.

SOME fifty years ago a young German artist, wishing to take up marine painting as a profession, fixed upon Heligoland as the most fitting place for a studio, and liked it so well that he has remained there ever since. He was induced to select that island for his *pied à terre*, not only on account of its position in mid-ocean, which would afford ever-changing views of sea and sky, but because it offered at the same time unusual facilities for observing a great variety of birds which temporarily rest there in the course of their migrations.

The observations, which he at first made for amusement, became so fascinating, that they developed into a course of serious study. Careful notes were taken of the different species of birds which alighted on the island, the dates of their arrival, the direction of the wind, and the condition of the weather at the time, with other particulars of great interest to naturalists, such as the separation of old and young birds on migration, the direction of their flight, and the altitude and speed with which they travel. The patient collection of such statistics for a period of nearly fifty years at length placed Herr Gätke in possession of such a mass of accumulated facts that it seemed imperative on him to publish at least the general results, if not the complete details, of such extended observations. Scientific ornithologists in all parts of the world gradually became aware of the nature of his studies, and pressed him for information. Some of them even visited him in his island home, and under his guidance became eye-witnesses of bird-migration on a scale which, judging only

from reports, had previously appeared to them exaggerated and well-nigh incredible. So far from this being the case, they were enabled to confirm by personal observation what they had formerly accepted only upon trust. Amongst others who thus journeyed to Heligoland to satisfy their curiosity was Mr. Henry Seebohm, who in his most interesting work, 'Siberia in Europe,' published in 1880, has given a graphic account of his visit to Herr Gätke, and of all he saw during his sojourn on the island. At page 249 of the volume just quoted he writes:—

“The *modus operandi* of migration has been to a large extent misunderstood. Few birds migrate by day. By far the greater number of species migrate by night. The number of places where nocturnal migrations can be systematically observed is very small. Two circumstances are requisite to make such observations successful. First, a sufficiently large population sufficiently interested in the event to permit no nocturnal migration to pass unobserved. Secondly, a sufficiently intelligent naturalist to record the sum of many years' observation. Probably in no place in the world are these desiderata so exactly fulfilled as upon the island of Heligoland.”

Heligoland is a very small place, probably not much more than a hundred acres in extent. It is an isolated triangular rock of red-sandstone, with perpendicular cliffs two or three hundred feet in height, dropping into a sea so shallow that at low-water one may scramble round the island at the foot of the cliffs. Most of the surface of this rock is covered with rich soil and grass.

About a mile from the island is a sandbank, the highest portion covered over with esparto-grass, and the lower portions covered by the sea at high tide, reducing the island from perhaps fifty acres to twenty-five.

The resident birds on Heligoland and Sandy Island probably do not exceed a dozen species; but in spring and autumn the number of birds that use these islands as a resting-place during migration is so large that as many as 15,000 Larks have been known to have been caught there in one night, and the number of species of birds obtained on these two small plots of land equals, if it does not exceed, that of any country of Europe.

There are many species of Siberian and American birds which have never been obtained in any part of Europe except upon the island of Heligoland,

From time to time Herr Gätke has published lists of the species observed there and obtained by him, and these lists are so remarkable for the number and variety of the species included that many ornithologists have doubted their accuracy.

The authenticity, however, of the Heligoland skins is stated by Mr. Seebohm to be "beyond all possible question." The fact is, as he says, that this little island is the only part of the world of which the ornithology has been properly worked. Every little boy on the island is a born and bred ornithologist. Every unfortunate bird which visits the island has to run the gauntlet of about forty guns, to say nothing of blow-pipes and catapults. The flight and note of every bird is familiar to every islander. A new species is immediately detected. The fisherman steers with a gun by his side; the peasant digs his potatoes with a gun on the turf and a heap of birds on his coat. The common birds are eaten, the rare ones sold to the bird-stuffer, and the new ones taken to Herr Gätke. Long before sunrise the island is bristling with guns; after dark the fowlers are busy with their nets, and at midnight the birds commit suicide by dashing against the lighthouse.

Some idea of the mortality which ensues from the last-mentioned cause may be formed from the following graphic description of what takes place:—

"Arrived at the lighthouse, an intensely interesting sight presented itself. The whole of the zone of light within range of the mirrors was alive with birds coming and going. Nothing else was visible in the darkness of the night but the lantern of the lighthouse vignettted in a drifting sea of birds. From the darkness in the east clouds of birds were continually emerging in an uninterrupted stream; a few swerved from their course, fluttered for a moment, as if dazzled by the light, and then gradually vanished with the rest in the western gloom. Occasionally a bird wheeled round the lighthouse and then passed on, and occasionally one fluttered against the glass like a moth against a lamp, tried to perch on the wire netting, and was caught by the lighthouse-man. I should be afraid to hazard a guess as to the hundreds of thousands that must have passed in a couple of hours, but the stray birds which the lighthouse-man succeeded in securing amounted to nearly 300."

When we consider, adds Mr. Seebohm, that this has been

going on for more than a quarter of a century, and that the results have been carefully chronicled, the wonder is not that so many species of birds have occurred on Heligoland, but that so many have hitherto escaped detection. This, he says, must be accounted for on the theory that after all the appearance of birds on Heligoland is only accidental.

For some time previous to 1892 Herr Gätke had commenced to prepare his notes for publication, and in that year he completed and issued a volume which will ever remain famous in the annals of Ornithology. Written in German, however, it failed to attract the wide attention which it deserves, and it was not until the present year that an English translation by Mr. R. Rosenstock, edited by Mr. J. A. Harvie Brown, at length supplied what has long been a desideratum with English naturalists. Like everything which emanates from the publishing house of Mr. David Douglas of Edinburgh, it is a model of what a book of this kind should be, the typography, paper, and illustrations being all in their way excellent. Many of the illustrations are reproductions of pen-and-ink sketches by the author; not finished drawings such as might be expected from so accomplished an artist, but rapidly executed sketches very characteristic of the species figured, and sufficiently accurate to illustrate the author's remarks. There are, moreover, two portraits of the veteran ornithologist, one of which, representing him in his shooting dress with a large grey gull in his right hand and a gun in his left, forms a striking and most appropriate illustration.

To attempt to give anything like an adequate summary of the varied contents of this volume of nearly 600 pages is well-nigh impossible, but we may allude briefly to the more important features. Roughly speaking, it is divided into two portions, the latter part, amounting to two-thirds of the volume, being occupied with a *catalogue raisonné* of all the birds which have been ascertained to have been met with on this remarkable island, with very full notes upon every species; while the first two hundred pages are devoted to such subjects as the course of migration generally in Heligoland, direction of the flight, altitude, velocity, meteorological conditions influencing migration, the order of migration according to age and sex, and exceptional phenomena. Between these two sections we find a most interesting chapter on "Changes in the colour of the plumage of birds without moulting."

The statistics furnished by Herr Gätke under these several headings are some of them very curious, and to those who are not professed ornithologists will probably be new.

“A large portion of the migrants,” says Herr Gätke, “travel within an east to west, another within a north to south, line of flight. Species which fail to find satisfactory winter quarters in the western countries of Europe, on arriving in these districts deviate from their westerly course, and pursue their journey in a southward direction.

“Those, on the other hand, whose autumn migration takes place in a southerly direction, persevere in their course from their breeding-station to the end of their journey, though some may make a more or less considerable deviation to the east.

“The predominant mode in which the migratory movement is performed is in a broad front or migration column, which in the case of species migrating to the west corresponds to the latitudinal range of their breeding area, and in those migrating southwards to the longitudinal extent of their nesting stations.”

The view much discussed in recent years, that migratory birds follow the coast lines, the drainage area of rivers, or depressions of valleys as fixed routes of migration, can, in the opinion of Herr Gätke, hardly be maintained. Too many facts, to some of which he refers, are at variance, he says, with this assumption. Direct observations in Heligoland have established the fact that in autumn the migration proceeds from east to west, and in spring in the opposite direction. Not all birds, however, reach their winter quarters by proceeding in a westward direction, some being sooner or later obliged to turn southwards in order to reach their destination.

The following curious observation shows the close attention which Herr Gätke has paid to the subject on which he writes:—

“During the autumn migration it frequently happens that when out at sea birds are carried into air currents stronger than is suitable to their line of flight, a violent S.E. wind being especially unfavourable. To escape this wind blowing obliquely through their plumage from behind, they turn their body southwards and appear to be flying in that direction. This, however, is not the case. They do not make the least forward progress to the south, but their flight is continued in as exact a westerly course, and with the same speed, as though the birds were moving

under favourable conditions in the direction of the long axis of their bodies. This is shown in the most convincing manner by such flocks as happen to pass immediately over the head of the observer."

The altitude at which birds fly, and the velocity they attain during migration, are subjects to which Herr Gätke has paid special attention, and on which he discourses at considerable length. From experiments which have been made by other writers to test the average speed of birds in flight,—swallows, game-birds, falcons, and homing pigeons,*—we are inclined to think that Herr Gätke has overrated the speed at which migratory birds usually travel, except when moving before the wind; but, as he gives reasons for his conclusions, it would not be possible to refute his statements without a more complete examination of the details than could be here attempted.

Herr Gätke's work is an extremely valuable one to naturalists, not only because it embodies the results of fifty years' observations made at one particular station, and on that account most reliable, but also because it contains so many suggestive remarks which deserve the consideration of other observers, who, though less favourably situated than himself, may be able one day, with the aid thus afforded them, to deal effectively with some of the problems of migration as yet unsolved.

ON THE RACES AND VARIETIES OF THE POLECAT.

BY ADOLPHE DRION, JUN.

IN the 'Bulletin de l'Académie Royale des Sciences, des Lettres et des Beaux-Arts de Belgique' (ser. 3, t. xiv. pp. 365-68), a Belgian naturalist, M. Drion, Jun., has published an article with this title, which has probably escaped the notice of the majority of our readers. Whether his views on this subject are to be accepted seems to us questionable, considering the extreme variation in colour to which the Polecat is liable. This animal has now become so rare in most parts of England, in consequence of being trapped by gamekeepers on every possible oppor-

* See 'Zoologist,' 1886, p. 299; 1888, p. 308; 1892, p. 362; 'Nature,' 1887, pp. 335, 480, 552, 599; 1888, pp. 369, 474; 'Field,' 1887, pp. 114, 242 and 1891, Dec. 5th.

tunity, that it would probably be difficult to carry out such a series of observations as those made by M. Drion, for want of a sufficiently large number of specimens for examination.

It may be of interest, however, to know what M. Drion's views are on this subject, and we accordingly append a translation of his article. He says:—

“In Belgium there are two races of Polecat, the yellow and the black race. The yellow race has a rather short body; it is high on its legs; the claws are lengthy and straight; the under parts of the body, the thighs, and the feet, are of a very dark colour, but the flanks are golden yellow; the contour of the eyes and muzzle is of a yellowish tinge, approaching to grey; the tail brown and bushy, especially in the old ones. The Yellow Polecat generally haunts marshy places and the banks of streams, but occasionally dry places and the neighbourhood of dwellings. Averse to all training, it becomes shy and timid in captivity.

“The Black Polecat is of a more elongated form. It is not so high on its legs as its congener; its claws are shorter and more curved. The ears, the contour of the eyes, and muzzle, are of a pure white, which contrasts strangely with the dark fur; the coat is black, although the sides show a washed-out yellowish tinge. It usually affects dry places in the neighbourhood of dwellings, but is occasionally found in river-banks and marshes. In captivity it is untamable. Not only is it, like the Yellow Polecat, rebellious to any kind of training, but it is fierce and blood-thirsty, even furiously attacking the hand that feeds it. Besides these two races, characterized by an appreciable difference in the structure of the body, the peculiar shape of the claws, the colour of the coat, and by their habits, there are intermediate shades which result from crossing. These are (1) the brownish yellow Polecat—a cross between the pure yellow and the pure black—subelongated and of medium shape. (2) The bronze golden-yellow. (3) The citron-yellow. (4) The grey, mixed with tarnished-yellow. (5) The *Patois à plastron*, an accidental variety.

“The Polecats shaded with bronzed golden-yellow, citron-yellow, and *à plastron*, are the progeny of the brownish-yellow Polecat crossed with the pure yellow or the black.

“The grey mixed with tarnished-yellow differs completely from the others by its coat, which is of a much more uniform tint over the whole body.

“I have not been able to decide upon this point, namely, whether it constitutes a distinct race from the two preceding; whether it results from a cross; or whether, in fact, it is not an escaped Ferret. The last-named seems more likely, for the Polecat-ferret is less sensitive to cold than the albino Ferret; and consequently much less liable to die of cold in a state of liberty. In the Natural History Museum at Brussels there is a young black Polecat and a young grey one, labelled ‘young,’ without comment. The difference in colour between these two mounted specimens is striking. The grey Polecat closely resembles the half-bred Ferret. It would seem that this was the result of a cross between a dusky Polecat and an albino. The Polecat à *plastron* is remarkable for a white or yellow spot on the throat.

“I have a grey specimen with a white throat, and a black specimen with a throat equally white; and I have seen black ones which have a yellow throat. The brownish-yellow Polecats are the commonest. The yellow ones and the black ones are somewhat rare. The two last-named are examples of the pure breed. The grey Polecat and those with the light throat are rarely met with. My observations are founded upon two hundred specimens of all shades, of which one hundred and eight were caught by myself, and ninety-two were brought to me by keepers.

“It was long supposed that the difference in colour between the yellow and the black Polecats was merely the result of local influences—accidental or climatic—or of age or sex. I can testify to the contrary, because I have caught yellow Polecats, male and female, young and old, showing the distinctive characteristics of their respective races. At all seasons I have caught black ones, young and old, male and female, from one end of the year to the other. My experience, moreover, confirms these views. In the month of September I secured two young male Polecats, yellow and black. I kept them in separate cages for three years, during which time there was, positively, neither change of colour nor change of shape. The yellow one remained yellow in summer, at the period of moulting, and in winter. The black one always retained the same dark coat. I noticed that the black one was much fiercer and bolder. He was also more active, and generally climbed to the top of his cage when disturbed. The yellow one was timid and less active in his

movements. He was always scratching at the floor of his cage, trying, as it were, to dig a burrow. In those of intermediate colour, the claws of those whose pelage are yellowish are more slender and less curved than the claws of the dusky Polecats. To appreciate the difference in the claws, one must secure examples of pure breed. The very young Polecats, of both varieties, scarcely a few months old, are dark. It is difficult, therefore, to decide at an early age whether they belong to the yellow or to the black race. The best furs are those of the pure yellow Polecat, the bronze-yellow, and the citron-yellow. The skins of the black Polecats are not much esteemed, and rarely come into the market. Finally, in every case, the adult male is always about one-third larger and stouter than the female."

THE LONG-TAILED FIELD MOUSE OF THE OUTER
HEBRIDES: A PROPOSED NEW SPECIES.

BY W. E. DE WINTON.

IN the summer of 1894 I had the good fortune to visit the island of Lewis in the Outer Hebrides, and there found the Long-tailed Field Mouse very common, as recorded in the 'Annals of Scottish Natural History' for January, 1895, p. 53.

This mouse is very distinct from *Mus sylvaticus* of the mainland, and I have only delayed in describing it as I was in hopes of again visiting the island this year. But though I have been unable to carry out my wish, the next best thing has happened; for my friend R. W. Pinney, a keen naturalist, has been shooting in the island of Barra, and has kindly sent me specimens, bringing up the number of my collection to over twenty, and confirming my opinion that this peculiar form would be found on all the islands of the group on which *Mus sylvaticus* occurs. This will show that I am not in a hurry to add to the British list before having fair material to work upon.

I propose for this mouse the name of

MUS HEBRIDENSIS, sp. n.

Resembling *Mus sylvaticus* in general form and colour, but having far smaller ears in proportion to its size; longer hind feet, which are also much stouter in the males; the form generally of

a distinctly stouter build, which is very striking in animals in the flesh, but which simple length-measurements cannot convey. In old specimens the colour of the under parts is generally dusky or sandy, with no distinct line between the upper and under parts, and I have never seen a specimen with a typical *sylvaticus* belly; the tail is almost uniformly brownish grey, and shorter and thicker in proportion.

The following table, taken from a few specimens of my own collecting, will show how *Mus hebridensis* compares in measurements with its nearest allies *M. sylvaticus* and *M. flavicollis*; that in size it about equals the latter, while the hind feet are larger, but the ears do not equal the dimensions of those of the much smaller *M. sylvaticus*.

Adults, with worn teeth.

Young, still in the grey pelage.

All measurements are in millimetres. The length of the tail does not include the terminal hairs, and that of the hind foot does not include the claws; the ear is measured on the inside from the notch; the measurement of the head and body and tail may be relied on as giving the total length of the animal in the flesh.

	M. HEBRIDENSIS.				M. FLAVICOLLIS.				M. SYLVATICUS.			
SEX, AD.	♂	♂	♂	♀	♀	♀	♂	♀	♀	♀	♀	♂
Head and Body .	106	106	112	108	108	110	110	115	93	92	92	97
Tail	96	99	100	95	108	115	112	112	86	82	78	85
Hind-foot	25	25	25	23½	24	23	24	24	22	22	22	23
Ear	16	16	16	15	18	18	18	18	17	16	17	17
SEX, JUV.	♀	♀	♂	♂	♀	♀	♂	♂	♂	♂	♀	♀
Head and Body .	96	92	94	94	81	84	68	90	83	83	71	78
Tail	82	81	86	83	84	83	60	93	75	79	59	70
Hind-foot	24	24	23½	25	21	22	20	24	22	21½	20	21
Ear	13½	15	15	15	16	16	16	17	16	16	16	16

This, following so soon upon my article in 'The Zoologist' of December, 1894, recording *Mus flavicollis*, Melchior, as a

British mammal, will no doubt make many naturalists sceptical; but I have only to say that in this case there is far less difficulty in reconciling the fact than in that widely distributed and unisolated form, and it emphasizes my former remark that there is much still to be learned about the British Mammalia, and that English naturalists have hitherto culpably neglected their duty.

Here let me again draw attention to the serial collection of small European mammals (invaluable to any one working in this line) being got together through the efforts of Mr. Oldfield Thomas at the British Museum (Natural History), and I ask any one who wishes to advance the knowledge of our native animals to contribute. Bats and Harvest Mice, *Mus minutus*, will be especially acceptable.

When we consider the length of time which must have elapsed since the islands of the Outer Hebrides were joined to the mainland, the complete isolation, so far as small land mammals are concerned, and the improbability of fresh blood being introduced, save at very rare intervals, it would be surprising if differences did not exist. Who can say whether these islands ever were joined to Scotland? or were not upheaved long prior to that country as it now is? Why do the rocks show such a vast difference? I am not much of a geologist, but I was very much struck with the beauty of the rocks, the crumpled foliated gneiss being so different from anything on the mainland. Then again we must consider that for many years there has not been a tree or shrub on the islands—I do not take into account the lately-planted specimens at Stornoway Castle and elsewhere—and the heather is extremely short. These are the conditions that the Field Mouse has to put up with, and small blame to him if he puts on bigger boots and wears less widely open ears in that land of rain.

[Messrs. Harvie Brown and Buckley, in their 'Vertebrate Fauna of Argyll and the Inner Hebrides,' 1892, state that they have examined specimens of the Long-tailed Field Mouse from several mainland localities from north to south, and that it is abundant in all the Inner Hebrides. Nothing is said as to any variation in size or colour from the typical *Mus sylvaticus*. In their previously-published volume on the Outer Hebrides (1888) this species is only provisionally included in the list of Mammals, not having been definitely recognised as occurring there at that date.—ED.]

ON THE ORIGIN OF THE TERMS "COB" AND "PEN."

BY THE EDITOR.

PROFESSOR NEWTON, in his excellent 'Dictionary of Birds' (art. "Cob"), quotes Yarrell (ed. 1, vol. iii. p. 130), to the effect that, "in the language of swanherds, the male swan is called a 'Cob,' the female a 'Pen'; these terms refer to the comparative size and grade of the two sexes," but (he adds) "corroboration of the first statement has been sought in vain, while the second is hardly intelligible."

Having recently had occasion to look over my notes on "Swan-marks," which have been accumulating for some years, I have come across several which throw light on the above quotation, and justify the first part of Yarrell's statement, the concluding part being evidently founded on a misapprehension.

The origin of the names "Cob" and "Pen" for the male and female swan respectively is traceable to the ancient "Laws and Orders for Swans," which were in vogue at a time when it was customary throughout England (instead of as now on one river only—the Thames) to mark all swans on the bill to denote ownership. There was then an office of "Master of the Swans throughout England," and commissions were issued periodically for holding "Swanherds Courts" or "Swan-Moots," at which "Orders" were made "where and when they were fit and necessary for the preservation of swans." These "orders" were copied out and made known by proclamation in market towns. Two such copies are in my possession; one of Elizabeth's time in MS., dated 1598, the other of Charles the First's time, printed and dated 1632. The former is entitled 'The Orders for Swannes exemplified out of the printed Orders for Swannes the xxvjth of marche, 1598'; the latter, a small quarto of considerable rarity, is entitled, 'The Orders, Lawes, and Ancient Customes of Swanns, Caused to be printed by John Witherings Esquire, Master and Governour of the Royal Game of Swans and Signets throughout England. Printed by August Mathewes, 1632.'

With the exception of this copy I have seen but two others, one of which was in possession of the late Mr. Stephen Tucker, Somerset Herald, the other in the British Museum (C. 31, e. 26).

Hone quotes an edition of 1570 ('Every Day Book,' ii. 958), and Lowndes mentions an edition of 1664 with a little variation in the title, chiefly in regard to the orthography; but of these I have not met with any copy. In those which I have examined, the sexes of swans are distinguished as "Cob" and "Pen." Thus in 1570, and again in 1598, it was "ordeyned" that if any brood be found being led by one swan, the swan and cygnets "shall be seized for the king, till due proof be had whose they are, and whose was the swan that is away, be it *cob* or *pen*"; for if the swan of one owner paired with that of another, there was a regulation as to the division of the brood in swan-upping time, when the cygnets were allotted and marked accordingly.* The printed rule in 1632 was thus worded:—"§ 7. In all common streames and private waters, when Cignets are taken up, the owner of the *Cob* must chuse the first Cignet, and the *Pen* the next, and so in order. But if there be three, then the owner of the Grasse where they breede must have the third, for the spoyle of his Grasse." At the present day, in the case of a mixed brood, the cygnets are divided between the two owners.

Nor is it only in the 'Lawes and Orders for Swannes' that we find a recognition of these terms to distinguish the sexes. Ben Jonson, in 1611, has the expression "I am not taken with a *cob* swan like Leda" ('Catiline,' act ii. sc. 1); and Henry Best, of Emswell, in the East Riding of York, in his 'Rural Economy in Yorkshire,' published in 1641, has a chapter on "Swannes and their breed," in which he tells us that "the hee swanne is called the *cobbe*, and the shee swanne the *penne*."

As to the derivation of the words, *cob* is evidently the A. Sax., *copp*; O. Fris., *kop*; Germ., *kopf*; Lat., *caput*; signifying the crown or top of the head, and, in the sense in which it was used by swanherds, having reference to the prominent *knob* at the base of the bill. Sir John Maundevile uses it for summit, as in the expression "the *cop* of the hille," as also does Wycliffe in a similar expression, "and they ledden him to the *coppe* of the hil on which her cytee was bildid to cast him down" (Luke iv. 29). The word was applied also to denote the crest of a bird. The gloss on Gautier de Bibelesworth explains "geline huppée," "*coppede* hen"; and Elyot gives "'stymphalide,' a *coppe* of

* See my lately published article on "Swan-upping," in 'The Field,' Sept. 28th, 1895.

fethers whiche standeth on the head of a byrde." In Norfolk (where it is said the term "coppie-crown" still has this meaning), Sir Thomas Browne, in 1668, applied it to the Spoonbill, which he characterised as "remarkable for its white colour, *copped* crown, and spoon or spatule-like bill." (See 'Zoologist,' 1877, p. 425.) Thus we may take it that the word *cob*, a variant of *cop* (still seen in "coping-stone"), was applied to the male swan by reason of the prominent knob at the base of the bill, which is more largely developed in the male than in the female.

As to the name *pen*, it is doubtless a contracted form of *penne*, not unfrequently used by the old writers for "feather." In the 'Vision of Piers Plowman' reference is made (v. 7923) to the "*pennes* of the pecok"; and in the 'Golden Legend' we read that "the foule that hath but fewe *pennes* or fethers may not well flee."

But seeing that swans of both sexes are feathered, like other birds, it may be asked, why should the term *pen* be restricted to the female bird? Probably from her habit, when sailing with her brood, of arching her wings proudly above her back, thus conspicuously displaying her *pennes*. In some of the old writers we find a special term—"busking"—to denote this peculiar action; to busk, or bush out the wings, evidently from *buske* or *boske* (O. F. *bosc*) as "bush" was anciently written, *e.g.*, by Chaucer. Spenser uses the word *buskets*, and Shakespeare, in 'The Tempest' (act iv. sc. 1), has "my *bosky* acres and my unshrubb'd down." A direct application of the term to the bird under notice may be found in 'A Tale of two Swannes,' printed in London by Roger Ward, for John Sheldrake, in 1590. Thus:—

" Not far from hence stands many a milke-white Swanne,
Attending for to entertaine their Prince ;
Among the which was one of chiefe accompt
That *busked* up her wings in greatest pride,
And so salutes this worthie companie."

From the foregoing remarks it will be seen that there is some corroboration of Yarrell's first statement, hitherto, as Professor Newton says, "sought in vain"; while in regard to his second, "hardly intelligible," the explanation above given may perhaps be more acceptable.

NOTES AND QUERIES.

MAMMALIA.

Hybrid Manx Cats: Gradual restoration of Tail.—A friend has sent me some curious statistics in reference to the progeny of a female Manx Cat and an ordinary Tom Cat in his possession. The successive litters consisted of three on each occasion. Thus:—

	No Tails.	Half Tails.	Full Tails.
1st litter	3	0	0
2nd „	2	1	0
3rd „	1	2	0
4th „	0	2	1
5th „	0	1	2
6th „	0	0	3

The gradual elimination of the tailless condition characteristic of the famous insular grimalkins is somewhat singular, and points out the strength of the ancestral reversion which is always striving to assert itself in all breeds of domestic animals.—ROBERT SERVICE (Maxwelltown, Dumfries).

Distribution of the Alpine Hare in S.W. Scotland.—In several of the local reports from the southern moors notice has been taken of the shooting of Blue Hares. This alpine species may now be considered thoroughly established in all suitable localities throughout the south and south-west of Scotland. It was introduced at Glenbuck in 1861. Within the next four years it had spread to the Lowthers and contiguous heights, to Queensberry, and to many of the hills at the head of Annandale. Then it began to progress westwards to the Southern Highlands, and soon populated all the picturesque mountains from whence flow the Galloway rivers on the one side, and the Ayrshire streams on the other. A great extension of the species took place during the hard winters of 1878, 1879, and 1880, and specimens were got on such isolated spots as Criffel and Screel, and even on the Kirkgunzeon moors; and I was shown a young one that had been mistaken for a rabbit and shot on Dalscairth—a low and unexpected situation in which to find this height-loving species.—ROBERT SERVICE (Maxwelltown, Dumfries).

[For further particulars on this subject see Zool. 1893, p. 265.—ED.]

A White Hare in Essex.—On Manning Farm, about two and a half miles from Laindon, during the last week of September, a pure white Hare was shot, but with eyes of the ordinary colour.—SAMUEL HUNT (Southend).

[For other notices of white Hares, see Zool. 1889, p. 143; 1890, p. 70; and 'Field,' 29th Aug. 1891, p. 332.—ED.]

BIRDS.

American Yellow-billed Cuckoo in Dorsetshire. — Through the courtesy of Mr. Rowland Ward, on Oct. 7th I had placed in my hands for examination a specimen, still unskinned, of *Cuculus americanus*, which had been picked up dead on Oct. 5th in a garden near Bridport. Never having had an opportunity of examining a bird of this species in the flesh before, I naturally regarded it with some curiosity, and immediately took a note of its measurements, general appearance, and colours of the soft parts. Comparing it first of all with the life-size coloured figure given by Gould, in his 'Birds of Europe,' I remarked a general agreement with the bird in hand, except in the following particulars. In Gould's figure the eye is bright red (as in *C. erythrophthalmus*), whereas in the bird before me it was hazel, with the eyelids lemon-yellow. Gould has shown the legs and feet of a greenish brown, no doubt in consequence of having drawn his figure from a dried skin in which the colour had faded: these parts in a freshly-killed specimen are lead-colour. In one other respect Gould's figure might be improved. The inner webs of the flight-feathers are extensively tinged with cinnamon, and the outer webs also to a less extent—a noticeable feature when the wings are extended, though less apparent when closed. In Gould's figure the closed wings are too much the colour of the back, which is olive-grey. It is observable that in the letter-press which accompanies his plate he has described the irides as hazel, and the legs and toes blue, but unfortunately, as so often happens, the plate does not accord with the text. Turning to the very useful 'Key to North-American Birds,' by Dr. Elliott Coues, the accuracy of his diagnosis of this species (p. 476) became apparent:—"Bill [long and decurved] black, extensively yellow, below and on the sides of upper mandible. Feet [short, zygodactyle] dark plumbeous. Above satiny olive-gray. Below pure white. Wings [with ten primaries] extensively cinnamon-rufous on inner webs of the quills [less conspicuously so on the outer webs]. [Tail-feathers 10, graduated.] [Two] Central tail-feathers like the back; the rest black, with large white tips, the outermost usually also edged with white. Very constant in colour, the chief variation being in extent and intensity of the cinnamon on the wings, which sometimes shows through when the wings are closed, and even tinges the coverts. Young birds differ chiefly in having the white ends of the tail-feathers less trenchant and extensive, the black not so pure; this state approaches the condition of *C. erythrophthalmus*, but does not match it

In the above extract I have inserted in square brackets such additional remarks as were suggested by a comparison with the fresh specimen. The measurements I found to be as follows:—Total length 11·75 in.; extent of wing, 16 in.; bill from gape, 1·25 in.; wing from carpus, 5·50 in.; tail,

6 in.; tarsus, 1 in. The plumage was in perfect condition, and there was no abrasion of the extremities of the wings or tail-feathers such as there certainly would have been had the bird made its escape from captivity. As above stated, it was picked up dead in a garden near Bridport, where it had been previously observed flying about. It is possible, of course, that its advent to this country may have been aided by a temporary rest in the rigging of some homeward-bound vessel, but of this there is no evidence. The last specimen of this bird recorded to have been met with on this side of the Atlantic was also picked up dead, in a wood near Aberystwyth in October, 1870 ('Handbook of British Birds,' p. 124), and in April, 1871, was exhibited at a meeting of the Zoological Society (P.Z.S. 1871, p. 299), by Mr. Dresser, who remarked that it showed no signs of having been in captivity, and was apparently a young bird. The specimen now under notice was evidently adult, as appeared not only by the measurements and the general absence of light edges to the feathers of the dorsal plumage, but also by the fully-developed bill and feet. This makes the sixth instance in which the American Yellow-billed Cuckoo has been met with in the British Islands.—J. E. HARTING.

The Rate of Flight in Birds.—Mr. Warde Fowler makes incidental mention (*supra*, p. 309) of a subject concerning which there seems to exist much difference of opinion among naturalists, *viz.* the rate of flight in birds. Since Mr. Fowler only "roughly calculated" the speed (150 miles per hour) at which the birds were travelling, it were unfair to take it as altogether expressive of his opinion; and I need only say that from repeated observations (made to satisfy myself as to the accuracy or otherwise of the estimates of Michelet and the Duke of Argyll) I conclude that Swallows very rarely exceed 100 miles per hour. Indeed, so far as I can judge, the ordinary flight of these birds during their migrations is from fifty to sixty miles per hour. Those who have noticed these migrations will to a greater or less extent agree with me in regarding the flight on such occasions as peculiar thereto—less brilliant and evolutionary, but more steadily maintained than the usual flight, being, in short, that of birds on a serious errand. Calculations made after the manner of Mr. Fowler's ("by noting the progress from point to point") are apt to be faulty, owing to the great difficulty of knowing for certain when birds are passing a distant point. It would be of interest and value if readers of 'The Zoologist' would give the benefit of their experience in this matter, with a view of arriving at some unanimity of opinion.—W. C. J. RUSKIN BUTTERFIELD (Stanhope Place, St. Leonards-on-Sea).

[The latest contributions to knowledge on this subject which have reached us are to be found in the recently-published English translation of Herr Gätke's 'Birds of Heligoland,' noticed in the first article of the present number. In the chapter on "Velocity of the Migration Flight" (p. 63)

some very remarkable statements are made with regard to the speed of certain species, so remarkable indeed that to most persons they must appear incredible. But they are made so positively that we must, at all events, assume that Herr Gätke has very good reasons for believing them to be true. Briefly put, what he says amounts to this, that in the case of the Hooded Crow "a speed of migration flight of no less than 108 geographical miles per hour has been established" (p. 64); and again, a comparison of his own observations on Heligoland with those made by Mr. Cordeaux on the east coast of England shows that these sluggish flyers pass over the 320 miles of German Ocean in three hours, which gives a velocity of nearly 108 geographical miles per hour (p. 68). The northern Bluethroat, he says, on its spring migration from its winter quarters in Africa, extends its flight in the course of one single spring night up to 54° N. latitude, accomplishing a distance of at least 1600 geographical miles within the space of nine hours (p. 65), "giving the almost miraculous velocity of 180 geographical miles per hour" (p. 66).

In the case of the American Golden Plover, *Charadrius virginicus*, flocks have been met with at a distance of 400 geographical miles east of Bermuda flying in a southerly direction on the way from their breeding places in Labrador to Northern Brazil. The distance between these points is 3200 miles, and since there is no point between on which they could alight for rest, they are obliged to perform the entire journey in one uninterrupted flight. The velocity in 15 hours would amount to 212 miles per hour.

These examples suffice to show that the estimates of speed put forward by Herr Gätke are considerably in excess of what other observers believe to be possible. We should hesitate to accept his figures in the case of the Bluethroat and the Golden Plover for two reasons. First, it appears impossible to prove that the Bluethroats which arrive in Heligoland from Egypt have not rested *en route*, and travelled by stages. He says himself (p. 10):—"It is, however, absolutely impossible to ascertain the manner and method of arrival of most of the visitors, even by the most careful observation; this is especially the case with the small song-birds and similar species, whose number increases with each minute, without our being able to see a single bird descending from on high, or shaping its course in any one particular direction." Secondly, in the case of the Plover, Herr Gätke makes no allowance for the fact that many birds which are not web-footed can and do temporarily alight upon the sea, or upon passing ships, and after a rest resume their journey. This has been observed not only in the case of different species of Sandpipers and Plovers, but also in the case of small passerine birds (*e.g.* Pipits and Crossbills, *cf.* Newton's 'Yarrell,' ii. p. 220), and even in the case of such soft-feathered birds as Pigeons ('The Field,' June 26th, and July 3rd, 1875).

Mr. Butterfield is convinced "from repeated observations that Swallows very rarely exceed 100 miles per hour." An experiment made between Pavia and Milan (Zool. 1886, p. 299) gave the rate of speed at $87\frac{1}{2}$ miles per hour. Another experiment, made in Sligo (Zool. 1888, p. 308) with a House Martin, taken from a nest containing young, and liberated at a distance of 10 miles, resulted in the bird reaching the nest in 12 minutes, a rate of speed equivalent to 50 miles per hour. A similar experiment was made with a Swallow, which was taken from the nest near Roubaix and liberated in Paris (Zool. 1889, p. 399). It returned home in an hour and a half, at the rate of two miles a minute, or 120 miles per hour. If these cases are to be relied on, Mr. Butterfield's estimate of 100 miles per hour as the average speed of Swallows is doubtless very near the mark; for we may assume that a bird having young in the nest, as an incentive to return quickly, would travel at greater speed than on ordinary occasions. Nine persons out of ten accustomed to observe the flight of birds would probably consider the speed of a Swallow to be infinitely greater than that of a Blue-throated Warbler, or—to take an allied species with which they would be more likely to be better acquainted—a Redstart. What then are we to think of Herr Gätke's estimate above quoted, which places the sustained speed of the Bluethroat when travelling from Egypt to Heligoland at 180 miles per hour? It seems to us incredible, and at all events cannot, we think, be regarded as a definitely ascertained fact.—ED.]

The Autumnal Movements of Swallows.—Almost any fine forenoon in September astonishingly large numbers of Swallows may be seen thronging the Sussex coast during their passage eastward. The flights commence generally shortly after sunrise, and continue up to, or even beyond, noon. At first detached parties, more or fewer in number, appear and pass onward; these being succeeded—but not always immediately—by the more regular stream, which proceeds with an uncertain continuity to the usually somewhat abrupt termination—reminding me indeed, throughout, of a snow-storm. In confirmation of the opening sentence, I may be allowed to transcribe from my note-book some particulars of a migratory flight which took place on the morning of September of last year. A friend and I took up our quarters on the coast a little to the west of St. Leonards, where a projecting bluff enabled us to remark every bird that passed its outermost point, and during four hours (from 8 to 12) I counted the passing birds for one minute each time the minute-hand of my friend's watch reached the successive numbers—*i. e.* I made twelve counts per hour at intervals of four minutes. The average proved to be 53 per minute, or, roughly, 3000 per hour. This means that 12,000 individuals passed us during the four hours of our stay. It should be borne in mind that this number does not represent the actual passage of birds. Likely enough many thousands passed before our arrival. I think this may be taken as a fair example of what happens more or less

daily throughout September. Sometimes the flights consist wholly of young and at others of old birds. Now and again a few Martins accompany them, and even a Sand Martin or two, but there is always a remarkable homogeneity in the separate flights. Considered with regard to the faculty whereby the phenomena of migration are performed, it is doubtful whether much progress has been made since attention was called to this subject by Prof. Newton twenty years ago in his British Association Address, "On certain neglected subjects of ornithological investigation" (*q. v.* Zool. 1875, pp. 4640-41, as also the admirable article "Migration," in his 'Dictionary of Birds,' pp. 547-571). In another direction, however, British ornithologists have employed themselves with some diligence—but with what degree of wisdom remains to be determined. One cannot but feel a little disappointed in the deductions of Dr. von Middendorff ('Die Isepiptesen Russlands, 1855') and Professor Palmén ('Om Foglarnes flyttningvägar, 1874'), although it would not be easy to overrate their services in suggesting and stimulating research.—
W. C. J. RUSKIN BUTTERFIELD (St. Leonards-on-Sea).

[Here, again, we would suggest a comparison of the observations above referred to with those published by Herr Gätke, who gives reasons (p. 66) for "the wide divergency between the results of his own observations and those arrived at by Dr. von Middendorff. An English translation of Prof. Palmén's 'Report on the Migration of Birds,' submitted to the second International Ornithological Congress in Budapest, 1891, and full of suggestive information, is printed, with a map, in the Smithsonian Report, 1893, pp. 375-396.—ED.]

Escape of a Caged Eagle.—On Oct. 2nd a Golden Eagle in the Zoological Gardens at Bristol contrived by an accident to make its escape. It was in an open-air cage with two other eagles, and on the entry of the keeper it flew up to the wire that formed the roof, and hung from the netting with its claws. The wire being old and the bird heavy, several of the meshes broke and left a large hole, through which, to the astonishment and dismay of the keeper, the eagle quickly managed to escape. It flew over the river towards the Leigh Woods, and the head keeper, Mr. Blunsden, followed in that direction. He passed through Failand and all round the grounds of Sir Cecil Miles, but without finding the bird. That it was afterwards seen over St. Philip's is probably accounted for by the fact that there was still a very high wind prevailing at the time, and that the bird after its captivity would not have the strength to fly against it for any great length of time. There is little hope that the bird, which was a female, and had been presented to the Gardens by Sir Greville Smyth, will be captured alive. Should any of our readers hear shortly of a Golden Eagle being shot or trapped, it would be well to ascertain whether it is the bird which has so lately made its escape, bearing traces of confinement, and if so, to report it to the Secretary at the Zoological Gardens, Bristol.

Black Tern in Wales.—As the Black Tern, *Hydrochelidon nigra*, appears to be a rare bird in Wales—Mr. Salter (p. 249) records a solitary instance of its occurrence at Aberystwyth—it may be well to note that I saw one of these birds near a pool of mine on July 26th last, never having observed one in this district before.—C. S. MAINWARING (Cerrig-y-druidion, Trefnant, North Wales).

Jackdaws hawking after Insects.—During some of the bright clear days of April both Jackdaws and Starlings were observed hawking after insects in the air, after the manner of Swallows, for many hours at a time during the warmer period of the day. Probably they were catching the little beetles with red wing-cases (*Aphodii*) that swarm in myriads on fine days at that season, and rise to great heights in the air. Starlings often hawk for insects in the manner described during the autumn months, but I do not remember ever having seen them or Jackdaws indulging in such habits so early in the year. The mention of Jackdaws reminds me of an amusing incident I once witnessed. A rough shaggy pony was reclining in a pasture field, and two Jackdaws were perched on his back engaged in pulling out beakfuls of hair with which to line their nests. The pony looked over his shoulders at them, and several times suddenly rolled over on the grass with the evident intention of catching and crushing the birds beneath him. Needless to say, the Jackdaws were too much on the alert to be caught in this manner, but flew up at once, settling again on his back to resume operations as soon as the pony had returned to his reclining posture.—ROBERT SERVICE (Maxwelltown, Dumfries, N.B.).

[We have frequently observed Jackdaws treating Fallow-deer in this way in the spring, and robbing them of hair to line their nests with. Their mode of procedure on such occasions has been described in 'The Zoologist' for 1878, p. 68.—ED.]

Twite Nesting in Confinement.—Mr. G. C. Swales, writing in the 'Avicultural Magazine' (No. 11), reports that during the past summer a pair of Twites, *Linota flavirostris* (Linn.), nested and reared their young in his aviary, which he describes as "quite out in the country." He says:—"The hen commenced to build on May 14th, and laid her first egg on the 17th, laying altogether five eggs and sitting closely after the third was laid. I did not again look at the eggs, but saw the old birds busy feeding on June 2nd and following days. I looked in the nest on the 8th, hoping to find some fine young birds, but the nest contained only one poor starved thing which died on the following day: the weather was very stormy at the time they were hatched, and I think this was the cause of their doing so badly. On the 15th I noticed that the hen had nearly completed another nest, and she laid on the 16th and three following days. Having a Redpoll

nesting at the same time, I gave her two of the Twites' eggs, making up the number for each with infertile eggs: both birds hatched on the same day; the two in the Redpoll's nest perished at once, though she is a good feeder, and has reared two broods of her own this season. The Twite successfully reared hers, and they left the nest on July 19th, and are now very fine birds and normally coloured. Young Twites are not nearly so precocious as Redpolls; they were a long time before they attempted to peck for themselves, and even now (August) clamour to the old ones for food, whereas I have seen young Redpolls, a week after leaving the nest, shell hard canary seed. My birds have no soft food given them, but as much of the flowering top of the dwarf grass, dandelion, and hardhead tops, thistle, plantain, &c., as they wish, and as many aphides off rose, apple, or plum trees as I can at the time obtain; infested branches being put in the aviary for the birds to peck them off. The latter, I consider, are very essential for the successful rearing of Finches in confinement, especially for the first few days after they are hatched.—G. C. SWAILES.

A Crane traced from its Nest to its Winter Quarters.—According to the Cairo correspondent of 'The Times,' Slatin, the recently escaped prisoner of the Khalifa, relates the following interesting occurrence. In December, 1892, the Khalifa handed him a small metal capsule, ordering him to open it and explain what it meant. It contained two small slips of paper each about the size of a visiting card, with an inscription in German, French, and English, stating that the capsule was attached to the neck of a Crane bred on the estate of Herr Falz-Fein, at Tskanea Nova, in the province of Taurida, South Russia (just north of the Crimea), who had released the bird, and requested any future captor to communicate to him particulars of date and place. Slatin, who speaks only from memory, for he was not allowed to retain or even copy the writing (the possession of any European writing being a punishable offence), thinks that the date of the bird's release was June or July, 1892. It was killed about November of that year, in Nubia, at Darel Shaigia, and the capsule was sent to Younes, the Emir of Dongola, who forwarded it by special messenger to the Khalifa, at Omdurman, a total journeying of about 800 miles by camels. Slatin has written to Herr Falz-Fein, informing him of the incident, the remarkable point of which is, that the paper reached the only man in the entire Soudan who could comply with the wish of the sender of the message.

Honey Buzzard Nesting in Herefordshire.—It may be of interest to note that during the past summer a pair of Honey Buzzards attempted to establish themselves in Bishopswood, near Ross, Hereford, but unfortunately, through the ignorance of a keeper, both birds were shot and their two eggs taken. Through the kindness of Mr. W. C. Ashdown, the taxidermist

in Hereford, I was able to examine the birds and his notes on them, which contain the following interesting particulars:—Cere, grey; iris, bright orange-yellow, showing that the birds were adult; contents of crop, wasp grubs, some pieces of the wasp's nest still adhering to the base of the bill of the female bird. It seems a pity, seeing the nature of the food of the Honey Buzzard, that such beautiful and useful creatures are not allowed to live in peace; but Bishopswood is an estate on which the landlord does not reside, and the keepers, no doubt, kill everything that does not actually increase the stock of pheasants. Now that Major McCalmont has come into the property, we may hope that so good a sportsman will endeavour in future to improve matters, and protect the Honey Buzzards, when next a pair visits this locality. I am informed that some years ago £40 was offered for a pair of these birds, with the eggs and nest, in this locality; but in the present case there was no question of bribe, only ignorance in mistaking the birds for Kites.—W. E. DE WINTON.

Hobby in Wiltshire.—It may be of interest to know that a Hobby (*Falco subbuteo*) was shot at Seend, near Melksham, about the second week of September. It was seen flying about in company with three others, but its sex was not positively ascertained, on account of its body having been thrown away by the amateur who skinned it. It was eventually sent to Mr. H. W. Marsden to be preserved, and through his courtesy I was enabled to examine the skin.—C. B. HORSBROUGH (4, Richmond Hill, Bath).

Immigration of the Solitary Snipe.—The Solitary Snipe, *Gallinago major*, is an annual visitor to this country in autumn, and so far as my experience goes, arrives long before the majority of the Common Snipe from the Continent put in their appearance. The name "Solitary" is well bestowed, although the contrary has been asserted (see Stevenson's 'Birds of Norfolk,' vol. ii. p. 30). I have never heard of a wisp of these birds being seen, or even a couple being flushed at the same time, although one day in the last week of August (twenty years ago), I came across three on the same marsh (the town marshes at Aldeburgh, Suffolk), two of which were bagged. But they were a long way apart, and on dry ground. They were easily recognizable from the Common Snipe (of which a few home-bred birds were about in the dykes) by their heavier flight, and by the white outer tail-feathers, which were flirled as the bird rose. In these same marshes, on Aug. 21st, 1876, the late Mr. N. F. Hele, of Aldeburgh, shot one in the dusk as it was running on the ground; and the late Mr. Herbert Greenwood informed me that he had shot several there at intervals, late in August or early in September. I suspect they may be found there every year, for this locality lies right in the way of immigrants from the Continent. As a rule, these birds affect drier situations than the Common Snipe, as I have already observed in my 'Handbook of British

Birds' (p. 51), where several instances in support of this statement are noted. As additional instances I may mention one shot in a dry clover-field, North Riding of York, Sept. 24th, 1858 (Field, Oct. 23rd, 1858), and another on a dry bean-stubble, Northants (Zool. 1880, p. 444). During the present autumn one was shot near Pickering, Yorkshire, on Sept. 21st; another "in a dry water-meadow" at Eaglesham, Renfrewshire, Sept. 27th. Instances of the occurrence of the Great Snipe here in spring are rare. One was shot near Lowestoft, in April, 1851 (Zool. 1851, p. 3175), and there is a record of this species having nested near Wroxham, in April, 1846 (Zool. *l. c.*). But the late Mr. Stevenson, who enquired carefully into the circumstances, and examined one of the eggs taken, has shown good reason for concluding that the nest was that of a Common Snipe ('Birds of Norfolk,' vol. ii. pp. 300-301). This bird is much rarer in Ireland than in England; of late years it has been recorded from Co. Cork (Zool. 1884, p. 149), Co. Galway (Zool. 1888, p. 33), and Co. Mayo (Zool. 1893, p. 434). As to the weight of the Solitary Snipe, I think Stevenson's statement (*op. cit.*, p. 302) that the usual weight is from $6\frac{1}{2}$ oz. to $8\frac{1}{2}$ oz. is quite correct. The following are the weights of some that have come under my notice:—

(1) Milton, Pewsey, Wilts	...	...	...	...	$7\frac{3}{4}$ oz.
(2) Witheridge, N. Devon	...	...	...	...	$7\frac{1}{2}$ "
(3) Morley, Devon	...	...	...	...	$7\frac{1}{2}$ "
(4) Dartmoor	...	...	...	...	$7\frac{1}{2}$ "
(5) Three near Yarmouth	...	...	...	7, $7\frac{1}{2}$, $7\frac{1}{2}$	"
(6) Three, Aldeburgh, Suffolk	...	...	...	7, $7\frac{3}{4}$, 8	"
(7) Thorpe, Northants	...	...	...	...	$7\frac{3}{4}$ "
(8) Melton Mowbray, Leicester	...	...	...	...	8 "
(9) Stickney, Lincolnshire	...	...	...	...	10 "
(10) Two, Holland	...	...	...	...	8, $8\frac{1}{2}$ "
(11) Eaglesham, Renfrewshire	...	...	...	...	10 "
(12) Pickering, Yorkshire	...	...	...	...	$10\frac{1}{4}$ "

The heaviest known to the author of the 'Fauna of Norfolk' (Rev. R. Lubbock) weighed 10 oz., as noted by Stevenson in the work above quoted. In addition to those above mentioned, I have seen many stuffed specimens in different parts of the country, the weights of which had not been ascertained by the respective owners.—J. E. HARTING.

Quail in the Isle of Wight.—I do not know if Quails have been often met with in the island at this season of the year, but I think it is always worth while chronicling their presence. I flushed one by Hurricane House, above Shanklin, on Oct. 2nd. The bird was close to the footpath, and flew only about twenty yards, so I put it up again, just to make sure, as it was getting dusk.—H. MARMADUKE LANGDALE (Royal Cliff, Sandown).

[It appears from the information contributed by the late Mr. A. G. More to Venables' 'Guide to the Isle of Wight' (p. 431), that the Quail is occasionally obtained there in late autumn and winter. A single instance only is known of its having nested in the island.—ED.]

Abnormal Nesting of the Goldcrest in Ireland.—The Golden-crested Wren (*Regulus cristatus*), strange to say, in this part of the country builds commonly against the sides of ivy-covered trees. The nest is not suspended under a branch of fir, as I have found it in England, and the nests here are badly and loosely put together.—A. T. MITCHELL (Drogheda, Co. Louth).

BATRACHIA.

Food of Toad.—A nephew of mine at Emsworth, near Portsmouth, writes me that he lately saw a Toad swallow a mouse. He watched the mouse, which was not quite full-grown, for some little time running about in a dazed condition, about a yard from the Toad, when suddenly, to his surprise, it appeared to be drawn into its mouth. The hind legs and tail of the mouse were visible for some little time after the rest of the body had disappeared, the tail continuing to twitch for fully three minutes after the legs had been absorbed. I send you these particulars, as I never previously heard of a Toad attacking an animal of that size, and am curious to know whether the occurrence is unusual.—R. H. RAMSBOTHAM (Monkmoor, Shrewsbury).

[The observations of naturalists in regard to the food of the Common Toad, *Bufo vulgaris*, show that it is in a great measure insectivorous, living chiefly upon flies, spiders, and beetles, but habitually taking earthworms also, which are generally seized by the middle and gradually stuffed into the mouth by the aid of the fore feet. This much we have ourselves observed, but it is new to us to learn that a Toad will not only attempt to seize and swallow a mouse, but will succeed in doing so. The mouse, we imagine, must have been a small one, and under the influence of a fascination which to some extent paralysed its movements, in the same way that a rabbit is affected when pursued by a Stoat. We should not have supposed it possible for a Toad to hold so large a prey, nor to digest it if swallowed; but a friend who has kept Toads alive for the purpose of observing their actions, assures us that he has fed large ones with young mice. We can therefore no longer doubt.—ED.]

CRUSTACEA.

Weight of Lobsters.—In August last three Lobsters were taken in Herring-nets in Loch Seaforth, and brought to Stornoway, which weighed respectively 7 lbs. 5 oz., 8 lbs. 9 oz., and 9 lbs. 8 oz. The largest was minus a claw, which made a difference in its weight of perhaps 2 lbs. All

three were remarkably tender, and good eating.—H. HOLMES (Aline Lodge, Stornoway, N.B.)

MOLLUSCA.

Hibernation of *Limax flavus*.—The little yellowish coloured Slug known to conchologists as *Limax flavus* is in the habit of hibernating in small colonies. I am told by a gardening friend that he found no less than twenty-four of them congregated together in a hole in a clod of earth. This is a most unusual number, so far as my experience goes.—ROBERT SERVICE (Maxwelltown, Dumfries).

INSECTS.

Insect Migration.—I have read with much interest the paper on migrating butterflies and dragonflies. There are several points in it which appear of great interest; thus some of the authorities quoted by you mention having seen swarms of butterflies sipping at damp places, and on this point I can certainly confirm them. In a dark African forest-path, and also in Madagascar woods, one of the most familiar sights is a great assemblage of bright blue and white butterflies, taking long, deep draughts of moisture from the unpleasant looking mud in a hollow of the road. Still, this is just what one would expect, for I found that, at any rate in the drier hours of the day, the best place for butterfly-hunting is always in the vicinity of a stream, which is only natural, for every creature is thirsty in Africa at such a time. With regard to their actual migration in large flocks, I have never seen such a phenomenon myself; all that I can say on the subject is that the sight of butterflies flying past by twos and threes is common when one is on a steamer near the shore. I am surprised at such an explanation as that given for these migrations, because I have always understood that the life of a butterfly is a short one, and how these insects should have time to migrate seems to me curious. You will, of course, know that there are certain species of *Argynnis* confined to the mountain-tops (above 10,000 ft.) of Kilimanjaro, Kenia, Ruwenzori, and possibly Milanje. I think that their occurrence and distribution would be worth your investigation, for these forms occur *only* on these isolated and distant summits, and not, if I am rightly informed, in the lower country between the hills. This would imply that they were capable of flying 600 miles, but, of course, the chance of any particular flight reaching a mountain at that distance is rather small. (The proportion of chances, I think, would be 360 to one.) If I understand your theory rightly, these migrations resemble the manner in which the over-populated countries of Asia sent forth irregular swarms of Goths, Huns, and others; and without some such explanation it is difficult to understand the distribution of butterflies in islands, and on such isolated

mountain summits as those mentioned above, which are really climatic islands. Dragonflies have a nearly regular patrol system along favourable stretches of path or the shore of a pond, &c. Any one can verify by observation that each has his own little district, and vigorously objects to any one poaching on his preserves; at least, I certainly believe this: hence it is, perhaps, more surprising that they should have a migration of the same kind.—G. F. SCOTT ELLIOT (Newton, Dumfries).

Insect Migration.—With reference to the article “Migration of Butterflies,” by the Editor, in the current number of ‘The Zoologist’ (p. 335), I have for many years been aware of the fact that there is, at irregular intervals, a very considerable immigration of insects across the North Sea to the east coast of England. These are chiefly butterflies, moths, and dragonflies, the latter *Libellula quadripunctata*. The great movement of *Plusia gamma* recorded by Herr Gätke in 1882, in August, across Heligoland, coincides with the appearance of immense numbers of the same insect on the coast districts of Lincolnshire and Yorkshire; this immigration was recorded by me in ‘The Field’ of Sept. 16th of that year. Few naturalists are aware with what apparent ease butterflies and moths cross an immense extent of water. I have seen from the cliffs of Heligoland the common Cabbage Butterfly drifting in from the east, some to alight, but the majority passing north and south of the island, and going west like so many flakes of snow. When in the middle of the North Sea I have also seen them pursuing the same course, and crossing close before the bows of the vessel without attempting to alight. During the autumn of 1894, about twenty-four examples of that lovely insect, *Sphinx convolvuli*, were taken in the Spurn district, and many more seen; these were probably immigrants. Many years since I recollect considerable numbers were washed up dead between Kilnsea and the Spurn. The amazing numbers of *Vanessa urticae* which have appeared during the present autumn, especially in east-coast districts, may perhaps be accounted for by a great migration across the North Sea; but of this further proof is needed. I have seen them this year, in September, by hundreds, over the flowers in small gardens in a town near the coast, where in former years single examples would scarcely have appeared.—JOHN CORDEAUX (Great Cotes, Lincolnshire).

Insect Migration.—For some years past I have carried on a series of observations at and near the Spurn Point on the Holderness coast, which leaves no doubt in my mind, and that of other observers with me, that there are erratic immigrations of some insects, at irregular intervals, from time to time. This opinion has been more than ever strongly forced upon me this month and last (Aug. and Sept.) by the sudden appearance on the Holderness coast of several insects in such numbers as almost to preclude

the probability of their being bred in the immediate neighbourhood. I refer more particularly to the Convolvulus Hawk-moth (*Sphinx convolvuli*), which visited all the honeysuckle then in flower upon various porches and summerhouses in the neighbourhood, and these flowers evidently were the only ones which they visited. They came with some regularity at dusk; this was, I think, what may be called their first flight. They would suddenly appear as winged phantoms, dart to the flower, poise on vibrating wings, their long proboscis thrust into the tube of the flower as they drank its nectar. During the succeeding three weeks from the time when they were first observed very many were seen, and I find from my notes that two dozen fell victims to the net. The point of interest is, Are these insects bred in the district in which they are taken, or are they immigrants? The food-plant is common in the neighbourhood, but, though carefully sought for year after year, neither the larvæ nor the pupæ have ever been taken. To the question whether the moth ever migrates or not, I think I may reply in the affirmative. Some years ago Mr. Philip Loten, of Easington, recorded the fact that one autumn many of these moths were picked up dead on the high-water mark between the Spurn and Easington; numbers were seen in this way and noted. There can be no doubt that these were immigrants which had dropped into the sea on failing to cross it. This year has been everywhere notable for the Admiral Butterfly, but the numbers on the Spurn Point were remarkable, and must, I feel sure, have been added to by migratory flights of considerable dimensions. I have myself seen butterflies crossing the North Sea, during a voyage from Sweden to Hull some few years ago, when passing over the Dogger Bank. The species then noticed was the Red Admiral in some numbers, where they would be probably about 300 miles from the nearest land and were heading west. Many small birds were passing the steamer at the same time, and in some instances were trying to catch the insects *en route*. It seems to me that there can be no doubt that if small Noctuæ like *Plusia gamma*, and butterflies can cross the North Sea, the powerful-flying *Sphinx* moths have (in fine weather) no difficulty in crossing the ocean in a few hours' time.—H. BENDELACK HEWETSON (11, Hanover Square, Leeds).

Insect Migration.—With reference to your interesting article on the migration of butterflies, I append extracts from my note-book in Ceylon. The butterfly is that figured by you on page 337, *Catophaga galena*, and very similar to our common Cabbage Butterfly:—In the month of November, at Colombo, a strong north wind blows daily along the sea-coast, at which season clouds of white butterflies appear flying in a continual stream, extending far inland for days and weeks. They are all flying *from the south* and in the eye of the wind, and the stronger the wind blows the more rapid is their flight. I never witnessed this fact without the greatest

astonishment. The Locust, with its strong body and powerful wings, cannot make head against the wind, but drifts with it; yet that a butterfly with a body so slight as scarcely to gain a fulcrum for the wings to bear on, and with wings offering so broad a surface to the breeze that one would expect to see it drift like a snowflake, should possess the faculty of propulsion against a strong wind, gives us a clue to an aerostatic principle with which we are not yet acquainted. It is to be noticed that the action of the wings of these butterflies is not horizontal, like the Admiral or the Tortoiseshell, nor is their flight even and continuous, but they are propelled in jerks, with the wings vertically closed and opened alternately, so as to offer the sharpest edge to the resistance of the wind. Thus the butterfly does not appear to propel itself, but to be driven forward by the action of the wind eddying round against the under surface of the wing presented to it; but how this is done it is not easy to demonstrate. As there is no land south of Ceylon, it seems evident that these butterflies deposit their eggs in the southern forests of this island, previous to their starting on their migration; otherwise the annual flights could not be kept up. I notice, however, that Mr. Mann gives the months of March and April as the season of migration witnessed by him; but while he gives the direction of their flight from N.E. to S.W., he does not state the direction of the wind. The S.W. monsoon usually commences in April, while the N.E. monsoon commences in October. I assume that these are the same flights returning after a circuit of the island, and flying against the southerly wind in the same manner as those seen by me in November were flying against the north wind. I cannot identify Navanghena, the place from whence Mr. Mann writes, and therefore do not speak confidently.—E. L. MITFORD (Pikdan House, Morpeth).

Insect Migration.—The Clouded Yellow Butterfly (*Colias edusa*) is one of the most interesting of British species, from its habit of appearing in the more northern parts of Britain at irregular intervals—a peculiarity which it shares in common with various other Lepidoptera. No satisfactory reason for this erratic behaviour has yet been advanced, nor knowledge gained of how or in what stage of its existence the insect passes the time between each appearance. In Scotland the first recorded capture of *C. edusa* was made in Arran in 1848, by Mr., afterwards Professor Sir, Wyville Thomson. Four years later one was captured near Largs, in Ayrshire, on Sept. 12th, by the late Mr. Birchall. The next, or third, Scottish specimen was secured at Kirkmahoe on Aug. 17th, 1857, by Mr. W. G. Gibson; and in the same year a few more were taken about Glencaple and neighbourhood. In 1859 some were seen near Newbie, and in 1862 Mr. Lennon and other local collectors took it in large numbers in this district. From 1862 till 1877 no one appears to have seen this butterfly on this side of the Border, but in the latter year it suddenly burst

forth in legions almost everywhere, but more especially in the south-western counties, and it was also taken so far north as the Orkney Islands. Since then, I do not think it was noticed in any part of Scotland until the autumn of 1889, when I heard of one having been taken at Dargavel, and others in Wigtownshire. Between that time and the present a few have been met with at irregular intervals, *e.g.* ten in 1892; but so far as I am aware there has been no remarkable invasion of them until the present year.—ROBERT SERVICE (Maxwelltown, Dumfries).

NOTICES OF NEW BOOKS.

Icebound on Kolguev: a Chapter in the Exploration of Arctic Europe; to which is added a Record of the Natural History of the Island. By AUBYN TREVOR BATTYE. Large demy 8vo. With illustrations. London: Constable & Co. 1895.

THE main facts concerning Mr. Trevor Battye's adventurous expedition to Kolguev Island are probably by this time well known to most of our readers. The interesting narrative which he has now published supplies us with the details, and gives us an account of what befell him during an enforced residence on the island, from June 16th to Sept. 13th, 1894. The ostensible object of his visit was to learn something of the birds which breed there or visit the place in their wanderings, and of the characteristic plants which grow there. Although not the first naturalist to explore this out-of-the-way island, he is the first Englishman who has braved the hardships of living there for a few months, and the results of his experience, as detailed in his book, have a novelty and an originality which render them particularly attractive.

The accident which detained him on the island three months instead of one, gave him an excellent opportunity of learning something of the Samoyedes, its only inhabitants. For some weeks he lived the life of these people, visited them in their *chooms* or huts, drove in their Reindeer sledges, and accompanied them on their wildfowling excursions. It was a pleasant experience, if somewhat a rough one; but he made a good use of his time, carefully noting the names of such birds as he identified, collecting specimens of a few, and gathering such plants as

appeared to him remarkable, for further examination and identification on his return. His observations on these, as given in appendices to his volume, include information of much interest. He was lucky enough to find eggs, both of the Grey Plover (*Squatarola helvetica*), and the Little Stint (*Tringa minuta*). Two specimens of the Curlew Sandpiper (*Tringa subarquata*) were found, but the hoped-for discovery of a nest of this species baffled all his endeavours; nor did any nest of the Knot (*Tringa canutus*) reward an unwearied search for it.

Perhaps the most curious portion of his narrative is that in which he describes the Samoyede method of catching Brent Geese, which constitute the chief winter provision of these wandering people. The birds are captured at a time when the majority of them are moulting their quill feathers, and are consequently unable to fly. They are then driven into nets, and the enormous number captured by this means seems almost incredible. Mr. Trevor Battye thus describes the *modus operandi* :—

“A low-lying stretch of land, half peat, half grass and marsh, and an island on the tidal flats, some four acres in extent. Round this, now that the tide was out, sand or shallow water, which deepened to a wide creek against the island's southern bank. Beyond this again sand or mud in ridges, and creek after creek. Further yet, perhaps three miles to seaward, the long line of the outer sandbank with its piled-up ice—and then the sea.

So bad was the day that only now and then as the mist lifted could you see the farthest ridges and the higher banks of mud. But when the banks appeared, they were crested with a *chevaux de frise*, which we knew were serried lines of geese. Seven boats under the command of the younger men were soon slipping down the creeks; for they were to get behind the geese. Then the reindeer teams were driven out, three on one side and four on the other, remaining as near as possible equidistant, to prevent escape by the flanks. All were now away except Uano, his wife Katrina, two or three small girls, the little boy Wanka, and myself. Katrina nursed her baby.

Before half an hour was gone by the geese began to rise. We could see them through the rain getting up in hundreds off the sands. Away behind us on the island was the trap. I must describe this particularly. At the water's edge, thirty yards apart, two poles were fixed, to which a net was fastened. The net was then carried inland, the two walls converging, until, at a point some forty yards from the entrance, they were not more than five yards apart. From this point they bellied out, and

formed a circular *cul de sac*. The netting was about four feet in height, of some three-inch mesh, and round the *cul de sac* was double. The uprights which carried it were strengthened by spurs.

Long before we could see the boats, for the mist had thickened, we could hear shouting and the cries of the geese. But after a bit first one and then another boat came into view. On the men came, but very slowly; now pulling across a creek, now pushing the 'arnoh' over a bit of mud or hauling it over a sand-ridge, sometimes leaving it altogether and running off to head the geese. So slowly they came zig-zagging along.

By this time we could see geese by thousands through the mist. I could even distinguish the short trumpet-note of the Brent among the general babel. It was indeed a babel. How to convey to you any idea of it I do not know. If you can imagine many hundred farmyard geese, and many thousand cornets all sounding together and crowded on by a handful of screaming wild men—if you can imagine this, then you are not far off the mark.

Nearer they came and nearer, the middle a dense solid mass of geese, the sides a constant stream of parties, large or small, running away like lamplighters for all that the sleighs might do to stop them. The very earth seemed geese, and for that matter the sky too. For there never was an interval when geese were not rising, and instead of going right away at once, as one would have looked for geese to do, they hung about the spot, circling round and rising higher and higher till they lost themselves in the mist. I could never have believed it possible that so many geese could be had on one small island.

Exactly at nine o'clock—five hours from the beginning—the advance guard of the swimming geese came round the corner of the creek. It was one solid phalanx of Brent. They seemed to be by far the fastest swimmers. For behind them at a considerable distance followed a smaller lot of Grey Geese, some swimming, some running along the edge.

Then with one accord nearly all these Grey Geese rose—five hundred perhaps there were. For some little while the geese delayed as though they felt they were getting too much inland, or suspected a trap in front. Then the boats came up from behind, and the geese crowded on. They didn't like going. Sometimes the leading geese would stop and wheel about, heading right into the mass. But the boats came on. Every moment I looked to see the Brent escape by diving, or expected some to rise, for it was plain enough that many were full-winged. Neither of these things they did; only like a pack of idiots they 'wanked' and swam along.

And now the body of Brent was exactly opposite the entrance to the nets, and about them in a half-circle were the boats. Round and round they swam, but refused to leave the water. The boats did not dare close in for fear the geese should break. It was a ticklish moment—the geese

would not make the land. At last a single old goose—a Bean Goose he was—stepped out and ran up the bank. He was quickly followed by one or two more, and then by the first of the Brent. And now that they had started, they went quickly enough, scrambling after one another and heading into the net. Over the green they ran like a flock of domestic geese. Sometimes they aimed for right or left, but then the children showed themselves and the geese were turned.

The last bird was in, and then we closed the rear. Not a Brent had flown, not a Brent had dived, not one escaped. Of all that army every bird was in the net—a dense, black, moving mass.”

Their escape being barred, the men proceeded to kill them by breaking their necks, and they were then stored for provisions in the following singular manner:—

“The turf cut round with the axe, where the cloudberry grew thickest, was torn up with the hands; then the geese were stood on their tails with the heads tucked in, till the girls had made a circular group some three or four yards across. Then the turfs were rolled back on them a double layer, and the packing was complete.”

Our extract of this curious description is so lengthy, that we have little space in which to refer to Mr. Trevor Battye's personal adventures: how he landed on the island with his companion, Mr. Thomas Hyland, a bird-stuffer from the steam-yacht 'Saxon,' chartered by Mr. Powys; how, in consequence of ice floating in, the ship was unable to take him off at the time arranged: how his sojourn there was consequently delayed for three months, so that his friends in England imagined he must have perished; how at last he was rescued by a Russian trader and safely landed near the Petchora Delta, whence, by an over-land route, he eventually returned safe to England.

These episodes are all graphically detailed in a fresh and lively style, and the reader is left in doubt which to admire most, the author's pluck under very trying circumstances, or his enthusiasm in making natural history collections under such very adverse conditions.

His narrative has been very appropriately illustrated by Mr. Nettleship and Mr. Charles Whympers, from photographs and rough sketches supplied to them, and the result is one of the most attractive books of travel by a naturalist that we have met with for some time.

The Fauna of British India, including Ceylon and Burma.
Birds. Vol. III. By W. T. BLANFORD, F.R.S. 8vo, pp.
i—xiv, 1—450. London: Taylor & Francis. 1895.

THE progress of this excellent undertaking, under the editorship of Dr. Blanford, must, from its very nature, be necessarily slow, in consequence of the enormous amount of material available, and the extent of the collections to be worked out. We have from time to time advised our readers of the appearance of different volumes in the series prepared by different specialists;* and we have now to direct attention to the third volume on the 'Birds' of India, which has just made its appearance. The first two volumes of this section were prepared by Mr. Eugene Oates, who would have completed his task had he not been obliged to return to his appointment in India, as explained in the Preface to his second volume. The work of completion, therefore, has been now undertaken by the Editor, who announces that although the original design was to finish the 'Birds' in three volumes, it has been decided that a fourth will be necessary, and of this he states that a considerable portion is already written.

The species of which descriptions appear in the present volume are the Picarian or non-Passerine perching birds, the Parrots, and the nocturnal and diurnal Birds of Prey. Thus the first *three* volumes of this work correspond to the first *two* of Jerdon's, and contain the same families of birds, although differently arranged.

As to classification, "the system adopted is in the main identical with those of Sharpe and Gadow, and differs in no important point from the classification of Selater and Newton." The chief difference between the plan here followed and those proposed by the ornithologists named is that no attempt has been made in the present work to arrange in larger categories the groups here termed Orders. This is due to the circumstance that there is a much wider general agreement as to the distinctness of the smaller ordinal or subordinal groups than as to their relations to each other. Although the synonymy seems well worked out, we regret to see here and there, as regards nomenclature, a want of conformity with the views of the above-named

* See 'Zoologist,' 1888, p. 395 (Mammals); 1889, p. 467 (Fishes); 1890, p. 150 (Birds).

contemporary ornithologists. We cannot presume to say who is right, we only regret the fact that in many instances they are unable to agree as to the precise generic and specific names a particular bird should bear. To take the case of a common and widely distributed species, the Kestrel, which in the 4th edition of Yarrell's 'British Birds' (i. 78) appears as *Falco tinnunculus*, is *Cerchneis tinnunculus* of Sharpe, and *Tinnunculus alaudarius* of Blanford. To take another instance. Jerdon places the Merlin in the same genus with the Hobby, and names it *Hypotriorchis æsalon*. Prof. Newton, regarding it as a typical falcon, calls it *Falco æsalon*. According to Dr. Sharpe it should be *Falco regulus*, Pallas, while Dr. Blanford, adopting the genus *Æsalon* of Kaup (1829), styles it *Æsalon regulus*! Alas! uniformity in nomenclature seems to be as far off as ever, and, we suspect, is not likely to be attained until an international congress of ornithologists appoints a committee to prepare for publication an authoritative 'Index generum et specierum.'

This state of things makes it troublesome for a tyro to find a particular species in Dr. Blanford's 'Index' to this volume, which does not include the English names. There is many a man in India, a good sportsman perhaps, and would-be naturalist, wishful, it may be, to do what he can in the cause of ornithology by collecting specimens, yet knowing nothing of scientific nomenclature. Anxious to identify some bird he has shot, he has no idea under what name to search for it in the Index. Hence it seems to us that the absence of the vernacular names detracts in one respect from the practical utility of the work.

The illustrations (chiefly figures of head and foot only) are excellent, but might well be more numerous.

The New Forest: its Traditions, Inhabitants, and Customs. By ROSE DE CRESPIGNY and HORACE HUTCHINSON. Post 8vo, pp. i-viii, 1-295. With Illustrations and Map. London: John Murray. 1895.

THIS is a gossip and very readable little book, in large type, well spaced out, and appropriately illustrated. It is not exactly a guide to the New Forest district, for no routes are indicated, nor information given as to what particular places are especially worth a visit from the tourist; but it conveys in a

pleasantly written style much that will interest intending visitors, be they naturalists, archæologists, or collectors of folk-lore. Those who already possess Wise's 'History of the New Forest,' which has gone through several editions, are not likely to find in the present volume much that will be new to them; and this is especially the case with the chapters which treat of the beasts, birds, insects, and plants to be met with in the Forest area, although here and there we find some remarks which bring the history of a particular species down to a later date than that referred to by Mr. Wise.

On the subject of deer a great deal more might have been written, and under this heading the author might have consulted with advantage what has been published by the Hon. Gerald Lascelles, the deputy surveyor of the Forest. Reference is made, under the head of "Game-preserving," to a gamekeeper named Toomer (p. 260), and we wonder that it did not occur to the authors to mention the curious case of a black pig, which was trained by a forest-keeper of that name to find game like a pointer. Daniel, who has published all the particulars in his 'Rural Sports' (vol. iii. p. 62), gives a portrait of this remarkable animal, which he says was broken by Richard Toomer to find game, and to back and stand, and was as staunch as any pointer. She daily improved, and in a few weeks would *retrieve* birds that had run. She stood partridges, black-game, pheasants, snipes, and rabbits in the same day, but was never known to point a hare. She sometimes stood a Jack Snipe when all the pointers had passed it by, and she would *back* the dogs when they pointed, although they refused to back her until spoken to.

Writing of the Badger, the authors of 'The New Forest' remark that "in a country that is not very closely preserved, and where such large tracts are covert, it is hard to form any judgment of an animal whose habits are so entirely nocturnal"; and they add that "no one seems to molest them." From this we infer that the authors never read 'The Field,' or they would know something of a Hampshire gentleman who hunts the Badger regularly in the Forest, and keeps a special breed of dogs for the purpose.

"The martron, or marten cat," we are told (p. 153), "has become extinct. For the rest there is abundance of stoats, weasels, snakes, field-mice, and all manner of vermin, such as

would naturally thrive in a closely wooded country where inhabitants are scarce and each keeper has a wide beat." The Polecat is not mentioned, from which we are to infer that it is at the present day as extinct as the Marten. The same may be said of the Kite, the Honey Buzzard, Common Buzzard, Marsh and Hen Harriers; but the authors, apparently, are unaware of the fact that Montagu's Harrier is not only an annual visitor to a certain part of the Forest, but is known to have nested there several times of late years. "Ten years ago," it is said (p. 258), "Lapwings were numerous on Brook Common. Now they are rarely there, though they still haunt the wilder plains."

Heron are numerous, and form a feature that is in harmonious keeping with the wilder landscapes of the Forest. The following passage, relating to this bird, will convey a good idea of the writers' style and power of observation:—

"Lately it happened to one of the present writers to be pointing out to a visitor the beauties of the view from the foot of Raik's Brake—an expanse of wild scrub, of heather and bracken, and of snipe-marsh yellow with the moss-patches and pale glints from the standing water here and there. Down the middle of the picture a stream came winding, and ever broadening as it came, from the tiny rivulet scarcely seen among the heather and bracken on the top of the long hill on the right. On the left a clump of firs threw a dark shadow across the stream, and the scene melted away in undulating distances to the blue hills of Dorsetshire. As we looked on this scene, which was absolutely without life or motion, a heron came heavily flapping over our heads and settled, on long legs, in the middle of the marsh. It was the completing touch that made the picture perfect, and a touch that is often present to complete the wilder landscapes in the Forest."

The Pheasant. Natural History, by the Rev. H. A. MACPHERSON; Shooting, by A. J. STUART WORTLEY; Cookery, by ALEXANDER INNES SHAND. 8vo, pp. 265. With illustrations. London: Longmans, Green & Co. 1895.

MESSRS. LONGMAN'S 'Fur and Feather Series,' of which two volumes have been already favourably noticed in this journal ('The Partridge,' Zool. 1894, p. 199, and 'The Grouse,' *tom. cit.*, p. 358), commends itself alike to naturalists and sportsmen, not only on account of the accurate information which is given in the different sections by authors who are well qualified to write

on the subjects which they have undertaken to deal with, but also on account of the excellent illustrations by Mr. A. Thorburn, which are so true to nature that they might well be mistaken for instantaneous photographs, instead of reproductions as they are of sketches in black and white.

Writing of the distribution of the Pheasant in Europe, Mr. Macpherson very properly points out (p. 6) the mistake which many writers have made in supposing that *Phasianus colchicus*, except where introduced by man's agency, is confined to the forests and marshes which fringe the shallow and slimy waters of the slow-flowing river Phasis. It exists in many parts of the Caucasus, extending eastward into Transcaucasia, and in a northerly direction to the Volga. In the twenty-second volume of the 'Catalogue of Birds in the British Museum' (p. 322), Mr. Ogilvie Grant has defined the range of this bird as embracing Southern Turkey, Greece, and the north of Asia Minor, as well as in the Caucasus; so that although it may be true enough that the Romans first became acquainted with it through specimens imported from Colchis, from what we now know of its geographical distribution, there is no reason why they might not have procured it from countries much nearer to Italy, had more particular search been made for it. Professor Giglioli considers that the Pheasant is as much indigenous to Europe as to the swamps of the Caucasus; *à propos* of which he states ('Avifauna Italica,' vol. i. p. 336) that it is to be found abundantly upon the frontier of Dalmatia, and also frequents the woods at the mouth of the river Drino in Albania, to which it certainly cannot have been introduced by human agency.

Referring to the introduction of the Pheasant into Ireland, Mr. Macpherson quotes Thompson to the effect that it must have been introduced into that country prior to the year 1589, when Robert Payne wrote that there was "great store" of these birds there. He might have added that Giraldus Cambrensis found no Pheasants nor Partridges in Ireland in 1183-86, nor were any noticed there nearly two centuries later, in 1363, by Ranulf Higden (*cf.* Zool. 1881, pp. 437-439).

As to the introduction of this bird into St. Helena, alluded to by Mr. Macpherson (p. 20), some fuller details than he has given may be found in an article on this subject published in 'The Zoologist' for 1886, p. 225.

Of late years we have heard something of the migratory movements of Grouse and Partridges (Zool. 1886, p. 107; 1893, p. 433; 1894, p. 18; and 1895, pp. 21, 69, 108). Mr. Macpherson tells us that in some districts the Pheasant also moves from a summer to a winter home. In the district of Zakatal [Zakhatali, Southern Russia], in the summer, Pheasants often migrate to higher ground at the foot of the mountains; but after the crops are gathered in, and on the approach of the first cold weather of the autumn, they again return to the low-lying valleys of the river Alazani, where they pass the winter in the reeds, long weeds, and bushes.

As to the food of wild Pheasants in this country, Mr. Macpherson says it consists chiefly of the tender shoots of plants, grass, bulbous roots, worms, and insects. The crop of one bird which he examined was full of the roots of the common buttercup. In addition they pick off the oak spangles, and eat such hard food as hazel nuts, of which no less than twenty-eight were taken from the crop of one bird, and ninety-three acorns from another. When hard pinched they feed on the polypody fern. Nothing is said about their occasionally feeding on yew, and of the mortality which consequently ensues; nor do we find any remarks upon lead-poisoning, resulting from their sometimes picking up shot-pellets in mistake for grain; the poisoning of Pheasants from both these causes has been reported from time to time in the columns of 'The Field.'

From the sportsman's point of view, of course the most interesting portion of this volume will be that in which Mr. Stuart Wortley discourses on the breeding and rearing of Pheasants, the management of coverts, and the best way of effecting a good show of birds when the time arrives for shooting them. His advice, founded on experience, carries conviction with it, and is not only well expressed, but thoroughly practical. This is what young sportsmen stand most in need of—good sound advice from one who is competent to give it. Indeed, we may go a step further, and say that not a few middle-aged sportsmen will gladly admit, on perusing this volume, that they have gleaned from it some very useful hints.

The closing chapter, by Mr. Shand, which deals with the cookery of the Pheasant, is sensibly and brightly written, and anecdotal withal. The monotonous commonplace of a recipe-

book is thus avoided, and Mr. Shand alternately amuses and instructs the reader until he leaves him with the following quotation from a letter of Sydney Smith to Canon Barham:—
“Many thanks, my dear sir, for your kind present of game. If there is a pure and elevated pleasure in this world it is that of roast pheasant and bread sauce; barn-door fowls for dissenters, but for real churchman, the thirty-nine-times-articled clerk, the pheasant! the pheasant!”

A Preliminary List of the Hemiptera of Colorado. By C. P. GILLETTE and CARL F. BAKER. 8vo, pp. 137. Fort Collins, Colorado. 1895.

THE amount of good entomological work which is being done in America is simply astonishing. While entomologists in this country are still trifling with popular books on Lepidoptera and Coleoptera, the Americans are energetically working out the insect fauna of their continent, and not only in the more showy orders of insects. We have here a catalogue of the insects belonging to one of the least-studied orders, and a catalogue of the productions of one of the most distant States, including hundreds of species, with the most elaborate information respecting localities, elevations, &c. Many species are here described as new by the best specialists in America, and the descriptions are frequently illustrated by magnified details. One oversight, however, may be noted: the catalogue gives no names but those of species and genera, proceeding in one list without any indication of the suborders Heteroptera and Homoptera by different headings.

It is quite time for British entomologists to bestir themselves, and to see that the productions of British colonies are worked out in the various orders other than those which are the most popular, although there is much to be done even as regards the latter. With respect to England itself, there are whole families of insects, comprising hundreds, if not thousands, of species, at which only one or two entomologists are at present working; while there are others concerning which very little native information is published, and that antiquated and unreliable.

THE ZOOLOGIST

No. 227.—November, 1895.

AN EXPEDITION TO THE SALVAGE ISLANDS.

By HON. CECIL BARING AND W. R. OGILVIE GRANT.*

FEW probably are aware of the existence of the Salvage Islands,† a small uninhabited group, situated, roughly speaking, between Madeira and the Canaries, and about 160 miles distant from the former, and eighty-five from Teneriffe.

According to the description given of them in the 'North Atlantic Memoir,' "the Salvages consist of an island named the Ilha Grande, or the Great Salvage, a larger island named Great Piton, and a smaller one called the Little Piton, together with several rocks. The Great Salvage lies in lat. $30^{\circ} 8'$, long. $15^{\circ} 55'$. It is of very irregular shape, and has a number of rocks about it within the distance of a mile. It is much intersected, and has several deep inlets, the most accessible of which is on the east side. It is covered with bushes, amongst which the thousands of sea-fowl make their nests. It is surrounded on all sides with dangers, most of which show, but many require all caution in approaching.

"The Great Piton lies at the distance of eight and a quarter miles W.S.W., three-quarters W., from Ilha Grande. This islet is two and three-eighths miles long, and has a hill or peak near the centre. The Little Piton lies at a mile from the western side

* From 'The Field,' of Sept. 21st and 28th, 1895. Communicated by the authors.

† From the Spanish, *Selvajes*—i.e. desert islands.

of the former, and is three-quarters of a mile long; both are comparatively narrow. These isles are seated upon and surrounded by one dangerous rocky bank, which extends from the western side of the little isle half a league to the westward. . . The southern part of the Great Piton appears green, its northern part barren. It may be seen five or six leagues off. The Little Piton is very flat, and is connected to the south point of the greater one by a continued ledge of rocks. The whole of the eastern side of the Great Piton is rocky and dangerous."

These islands were visited so recently as 1889 by Mr. E. F. Knight, who, in his book, 'The Cruise of the *Alerte*,' has given a description of them, excellent from the seaman's point of view, but incomplete from that of the naturalist. Although the Admiralty chart gives the coasts and shoals of the Great Salvage very correctly, since this was prepared great changes must have taken place at the Pitons or southern islands, and this part of the chart is now far from correct. There can be no doubt that the sea has made great encroachments on the land, for the Great Piton cannot now be more than a mile and a half long, including the outlying rocks which are connected with the mainland at low water. Great Salvage is at the present time by far the largest of the three, its steep, rocky coast having defied the fury of the Atlantic.

Our object in visiting the Salvages was to ascertain what features of interest the flora and fauna presented. The flora of the Great Salvage had already been described by Lowe in a little pamphlet entitled '*Florulæ Salvagicæ Tentamen, or a List of Plants collected in the Salvages or Salvage Islands*,' but he never visited these islands himself, the whole of his material having been obtained through the Portuguese fishermen, who every autumn frequent these islands as a fishing station, catching at the same time enormous numbers of the young of the Great Shearwater (*Puffinus kuhli*), which are there in thousands, and valuable for their oil and feathers. By going in the early part of the year we hoped to find many plants in flower which Lowe had not obtained, and were not disappointed. We took ship, accordingly, for Madeira, and landed at Funchal on April 10th, after a splendid passage on the '*Tantallon Castle*,' the largest and one of the best equipped ships of the Castle line. Nor must we pass over this part of our journey without expressing our

appreciation of the splendid management and extreme comfort on board the boats of this line, and the general excellence of all their internal arrangements. Our baggage, necessarily bulky, as it comprised tents, bedding, a large amount of collecting-gear, and many gallons of spirit, was taken the greatest care of, and nothing could exceed the kindness and civility of the officers, though we must have given them a considerable amount of extra trouble. Finding it impossible to procure a craft suitable to our purpose at Madeira, and being obliged to remain there for a week, we paid a flying visit to the islands of Porto Santo, which lie about thirty miles to the north-west, and obtained some interesting zoological specimens of all kinds. The Little Shearwater (*Puffinus assimilis*) was breeding on the Lime Island, and several nestlings in various stages of downy plumage were obtained, the larger ones appearing nearly twice as big as their parents. Like the young of all petrels, the bodies of these birds are thickly coated with a layer of yellow fat, and the skins require to be very carefully cleaned and prepared.

Among the birds obtained was a Kestrel, and being curious to ascertain what she had been preying on, we opened the stomach and found that it contained nothing but seven snail shells (*Helix pisana*) which had been swallowed whole! Curious diet for a bird of prey. As we traversed the fields of growing crops, the note of the Quail was constantly heard, and here and there we accidentally flushed one after nearly walking on to it, but it is almost hopeless looking for these birds without dogs. There were numerous flocks of Schimper's Rock Dove (*Columba schimperi*), which were rather wild and difficult to approach, as they are constantly pursued and shot at by the native gunners. This species much resembles the common Stock Dove in general appearance, having the rump grey like the back, but the general colour of the upper parts is altogether much paler, and there are two black bands across the wings, as in the Rock Dove. The small birds, though fairly numerous, belonged to few species, the commonest being Pipits (*Anthus bertheloti*), Rock Sparrows, and Linnets, while a few Canaries, Swifts, Swallows, &c., were observed. A fine series of the peculiar land snail (*Helix nivosa*) was collected, the species being apparently extremely local, and said to be only obtained at the base of the western rocky point where we met with them. Of spiders, the largest on the island is the Tarantula (*Lycosa made-*

riana), which is to be found on the higher stony ground, and with its shining green eyes, powerful jaws, and hairy, tawny-coloured legs, is altogether a most wicked-looking monster. Like the rest of its genus, it makes little or no web, and lives a secluded life beneath some particular stone, surrounded by the empty shells of numerous small land snails (*Helix paupercula*), which apparently form its principal food. With its powerful jaws it makes a hole in the side of the shell, and gradually sucks out the mollusc, and this diet is varied with millipeds and small isopodous crustacea, its nest being surrounded by their chitinous remains. The Portuguese are very much afraid of these large spiders, and no doubt with good reason, for they must be capable of inflicting a severe and most poisonous bite; but there is another much smaller black species (*Latrodectus 13-guttatus*) with a diminutive head and much swollen and rounded abdomen, like a black currant, which is held in much greater dread. The fangs are so small that it appears a most harmless insect, and it has frequently been handled by one of the writers with perfect impunity; but all the same, we have been since informed on the best authority that it can not only bite but is extremely poisonous. Porto Santo would be a most delightful place to spend a week or so, and we greatly regretted that an outbreak of smallpox prevented our returning there again in May to make a much more complete examination of this and the other rocky islets of the group. There is fair accommodation to be had in the little fishing village, but it would undoubtedly be very much pleasanter and more comfortable to take one's own tenting-gear and camp out. Those who are fond of sea fishing would find plenty of amusement.

A week after our arrival at Madeira we sailed for the Canaries, and found ourselves early on April 19th in the port of Santa Cruz (Teneriffe), a bright sun shining, and our spirits, which had been somewhat damped by the failure of our plans at Madeira, and by the continuously bad weather which we had experienced so far, correspondingly elated. Our steamer waited here till midnight, so we drove up to Laguna, and spent a pleasant day strolling about the green lanes in the immediate vicinity of that village, a place too well known to need detailed description here. There was no lack of bird life. On the way up we saw many Swifts and Pipits, Ravens, Kestrels, Kites, and Hoopoes, and near Laguna, Canaries, Common Buntings, Blackcaps, Spectacled Warblers,

Chiff-chaffs, Tits, &c., were plentiful. The Spectacled Warblers had bred, and we saw several old birds with broods of young on the wing, some of which were preserved. As the ship did not sail till midnight, we had plenty of time to skin all our specimens on board, and early next morning found us at La Luz, the port of Las Palmas, a spot designed by nature to be fair, but greatly defiled by man, who has turned it into a coaling station for his ships, and stirred up in the making of his roads an unspeakable quantity of dust.

At Las Palmas we were most kindly received by Mr. Richard Blandy and Mr. A. Doorley, to whose energetic and well-timed assistance we are largely indebted for the ultimate attainment of the object we had in view. Through the instrumentality of these gentlemen we were able to charter from the Gran Canary Coaling Company the 'Pedro del Castillo,' a small steam-tug of about 25 tons, which proved a very efficient means of transport to the Salvages. We were very fortunate in being able to do this, as, although there is no lack of excellent schooners at Las Palmas, we should scarcely have been able to undertake the journey in a sailing vessel, for the time at our disposal was limited to about twelve days, and the Salvages lie about 123 miles N. and by E. magnetic from Las Palmas, *i.e.*, almost dead in the eye of the trade wind or brisa, which blows at this time of year with great regularity, and at times—as we found out later on—with considerable vigour.

In addition to the 'Pedro,' her helmsman and engineers, we secured the services of a boat's crew numbering four (Juan, Francisco, Eneas, and Manuel), of one Miguel, who acted as spokesman and (on shore) as cook, and of Pedro, a pilot from Lanzarote, a silent man, brown and blear-eyed, presumably from life-long contemplation of the wind's eye. A most well-disposed, well-behaved, and obliging lot of men they proved, in spite of the fact that we could only communicate our thoughts to them in pigeon Spanish with the help of a dictionary and Ollendorf's 'Manual.'

The 'Pedro' having taken in supplies, and all preparations having been made, the following day (Sunday, 21st) saw us steaming gaily out of the harbour about three o'clock on a sunny afternoon, the warmth of which was tempered by the above-mentioned brisa, which was blowing gently from its accustomed quarter. We were in high spirits. Rafaello, the captain, blew

the 'Pedro's' whistle until the whole harbour was aroused. The 'Pedro' was said to do seven or eight knots, and so we left the mole of La Luz, expecting, with ordinary luck, to anchor off the Great Salvage early on the following afternoon. We were no sooner outside the breakwater, although still sheltered by the land, than we became acutely conscious of the large size of the Atlantic rollers and of the relatively smaller dimensions of our 'Pedro,' to whose credit be it said, as she proved from first to last a safe and excellent sea-boat. She was built of steel, about 40 ft. long, and of a nature so inherently buoyant that in her frantic efforts to surmount the waves she seemed at times to be in imminent danger of turning herself inside out. This made repose on deck out of the question, there being no room to lie down. Below the only accommodation consisted of the hold, the forward end of which was fitted with four wooden bunks. Into some of the vacant space we had stowed our camping and collecting gear, and what remained was used as a resting-place by our crew. The hatchway and wooden skylights being shut down and a tarpaulin made fast over them to prevent the ingress of salt water, it may be imagined that during the night, when all but the watch had turned in and there were several pipes going, the quarters were what sailors call snug.

The next morning broke cloudy with a trifle more east in the wind, which enabled us to set our little fore-and-aft sail. The men were in high spirits, climbing with their almost prehensile feet up the two wire stays that formed the 'Pedro's' standing rigging, and pointing out, as a sure sign that land was near, a Pardella, the "bird that sleeps on shore." Of this bird, the Mediterranean Shearwater (*Puffinus kuhli*), we had already made the acquaintance at Porto Santo, and were destined to see a good deal of before we got home.

In the course of conversation, somewhat laboriously carried on, it transpired that our men considered the distance from Las Palmas to the Salvages to be about ninety miles. The chart, as we happened to know, though there was no such document on board, made it 123 miles, and it soon became evident that there was a great deal of uncertainty about our position, and that our voyage to the Salvages was developing into a search for those islands—a search which might very easily be unattended with success. There was a sailing vessel in sight well down to

leeward. A Spanish schooner our men said, and they determined to hail her, if possible, and ask for information. She was running before the wind, heading evidently for Las Palmas, and we bore down on her to cut her off, which we succeeded in doing after steaming for an hour and a half. When within a quarter of a mile we hoisted our Spanish ensign with a knot tied in it (!), and whistled, and presently had the satisfaction of seeing the object of our pursuit wear slowly round and at the same time hoist French colours. The French barquentine Georges——er she turned out to be (part of the name being painted on the after ports, which were raised, was illegible), from Havre to Las Palmas. We steamed as near as we could as she lay hove to, rolling heavily, and the captain told us, as near as we could understand, that the Salvages lay sixty-six miles N.W. This was at 8 a.m. We thanked him, bore up once more, and shaped our course N.W. The weather was not very inviting, and at intervals it came on very thick. At three o'clock on Monday afternoon, as it was obvious that we could not make the Salvages that day, we decided to put back for the purpose of making the Peak of Teneriffe and taking fresh bearings from that point. Accordingly we steered south, going easily with wind and sea, and at 5.30, not a little to our surprise, the men descried the Peak up among the clouds. Once more the 'Pedro's' head was pointed northward, and our true course having been determined to every one's satisfaction, though not without a great deal of talking, we steamed ahead. All night we went slowly, as there was a good deal of swell, and we did not want to make the Salvages by running on to them; and very soon after daylight we made out, to our very great joy, first one and then another blue bump on the horizon—the Salvages without a doubt. At eight o'clock we were off the Great Piton, described in the Admiralty chart as three miles long, which it certainly is not. Here we landed one of our party and three men, and the 'Pedro' then proceeded to Great Salvage, some nine miles off, where everything was safely landed by 11.30, the passage having taken us 44 hours. The 'Pedro,' having revisited the Great Piton in the afternoon, and brought back the rest of our party, started on her return for Las Palmas early on the morning of Wednesday, April 24th. We must not omit to mention our indebtedness to Sir M. J. T. Cabral de Noronha, of Madeira, the present owner of the Salvages, for, on

learning our wish to land and collect there, he at once granted permission, only stipulating that we should not shoot his goats, which have now increased to about a score, and become, of course, perfectly wild. We were very fortunate in our landing on the Great Salvage, for the entrance to the Southern Bay winds in and out among rocks, many of which are below the surface, and, except in comparatively calm weather, it must be extremely risky, if not impossible, to land, for the boat has to be backed gradually up to a shelf of rock, and it would be the easiest thing in the world to be stove in when there is anything of a swell. Our men occupied a couple of stone huts built by the Portuguese fishermen just above the landing place, but we preferred our large and comfortable tent, where we soon made ourselves extremely happy. Innumerable hungry fleas, who gave us a warm welcome, tenanted the Portuguese huts, but we were obliged to make use of one of these to shelter our large collecting-boxes and drums of spirits from the sun, which at times was extremely powerful.

The Salvages are entirely of volcanic origin, and the dark steep rocks of the Great Salvage, where we pitched our camp, rise from the sea to a height of from one to three hundred feet. Above the precipices the top of the island is comparatively flat, and mostly strewn with sharp, loose stones, and volcanic *débris*, which made short work of shooting boots, cutting them to pieces. The highest point—there are two conspicuous hillocks—rises to a height of about 450 ft. The most striking plants were the wild tomato (*Lycopersicum esculentum*), with its pretty yellow flowers, pleasant aromatic smell, and small scarlet fruits, which proved delicious eating; the Ice-plant (*Mesembrianthemum crystallinum*), with its lovely white star-like flowers; and the Asparagus (probably *Asparagus scoparius*), which grew to a considerable size, some of the bushes being several feet high, and forming good covert for the Rabbits. There were many other interesting plants, of most of which we procured specimens in flower; we may mention the curious *Phelipæa lutea*, belonging to the Broomrape family, with its thick fleshy stem, ending in a dense raceme of yellow bell-shaped flowers. Among the asparagus and tomatoes, as well as on the rocky faces of the island, there were endless Rabbits, not very large, it is true, but very fat and in splendid condition, with a flavour quite unlike any we have tasted elsewhere. We attributed their excellence to the tomatoes on which they chiefly

feed; baked as our Spanish cook Miguel did them, and served with onions, wild tomatoes, and a little sweet oil, they were truly excellent. Some of these Rabbits were of a light sandy yellow colour, and we made skins of these as well as of the ordinary coloured ones. It is said to be several hundred years since they were introduced, and it seems marvellous to us that they should have thriven so well, and deteriorated so little in size, in such a restricted area, without the intervention of fresh blood. It soon became evident to us that either Rats or some large species of Mouse were numerous towards the top of the island, though we never saw any trace of them about our camp, or on the lower ground, and soon all the traps—smaller cyclone mouse-traps, and large toothless rat-traps—were set in likely runs. On visiting these at six o'clock the following morning, we were rewarded by several captures in the cyclones, and in our ignorance fondly imagined that we had found a new species allied to the House Mouse, and having the same small eyes, but altogether a considerably larger animal. The under parts were pure white, the back brownish, the ears larger, and the tail thicker than in the Common Mouse; in fact, the whole animal, had it not been for its small eyes, reminded us strongly of the Wood Mouse (*Mus sylvaticus*). Mr. Oldfield Thomas, a leading authority on mice, has, however, informed us that the Great Salvage Mouse is the same species as that met with in North Africa. We caught a number of these mice, and brought back a series of beautiful skins. Meanwhile, the rat-traps had done no execution; and, though the flesh with which they were baited was all eaten by the morning, the nocturnal visitors were evidently not heavy enough to start the spring. By setting them very lightly, however, we succeeded in catching two of the mice, but never a rat, and satisfied ourselves that the former were the inhabitants of the rather large burrows, and the only animal of their kind on the Great Salvage. Their droppings were so large that it seemed impossible that they could be produced by anything smaller than a rat of some kind, but we ascertained for certain that this was not the case. Further on we shall refer to the wholesale destruction of the White-breasted Petrel (*Pelagodroma marina*) and their eggs by these comparatively small rodents.

Our arrival apparently caused immense excitement among the bird inhabitants of Great Salvage, our tent being a special object

of wonder, the Pardellas, or Mediterranean Shearwaters (*Puffinus kuhli*), by far the most numerous species on the island, being especially bold and noisy in their greeting. The high volcanic rocks surrounding the south bay are full of miniature caves, in most of which a pair of Pardellas had their home, and towards sunset the whole population turned out, wheeling and squealing round our encampment, and offering the most tempting rocketing shots as they swept over the high rocks above us.

The male, in a harsh guttural voice, cries, "ia-gow-a-gow-a-gow," and the female chimes in, "ia-ia-ia"; and it may be imagined that with thousands of these miscreants circling close round our tent during the night, tired as we were, sleep was almost impossible on the first evening of our stay.

Our daily programme varied little; we got up as soon as it was light, about five o'clock, and after a swim in South Bay, dressed and breakfasted. As soon as the men's work had been settled, we started off on a collecting tour till twelve o'clock, when we dined; after a pipe we again went on the prowl till it was time for supper. In this way we generally found time for about ten hours' steady collecting, and kept our taxidermist well employed in spite of all the help we could give him.

We generally had our evening meal about six o'clock, so as to get it over before sunset, when it soon became dark; and during the whole of our visit we used every night to be mobbed by these noisy Pardellas. "The march past," as we called it, generally commenced about six, and continued with unabated zest till we turned in about 10.30 and heard no more. In spite of the tempting shots they offered, we killed very few of these birds, only such as we required for specimens; but our men were not so sparing, for they used every day to catch numbers for food (they skinned and boiled them!), and took back sacks full to Las Palmas, where, when salted, they are much esteemed by the Spanish fishermen.

The Pardella breeds late, and though during the daytime we found most of the birds in pairs in their rocky nesting chambers, we never procured a single egg; as already mentioned, enormous numbers of the young are collected by the Portuguese fishermen in the autumn, being valued for their oil and downy feathers. The happy couples greatly resent being disturbed in their nesting cavities, and, unless extracted without hesitation, retaliate by

biting with great vigour, their curved bills, with their sharp, cutting edges, being apt to leave an ugly wound on those unskilled in the mode of handling them. Though the majority pass the day in the holes in the rocks, many also rest at sea, and may be seen in flocks floating quietly on the surface at most hours of the day. On our return journey, the 'Pedro' ran right over one of these Shearwaters, sleeping peacefully with its head under its wing, but beyond a rough awakening, it flew off apparently none the worse. After finishing our six o'clock meal, we generally spent the rest of the evening smoking our pipes, and skinning what remained of the birds got during our day's collecting, and attending to the other collections by lantern light. On several occasions we were startled by one of these Great Shearwaters dashing into our midst, like some great white moth dazzled by the light; fortunately none of them ever struck us, or we might have had the worst of the encounter. These birds are evidently the "Cormorants" alluded to by Mr. Knight in his 'Cruise of the Alerte,' p. 85. He writes: "The Cormorants dwelt with their families in fine stone houses, which they had constructed with great ingenuity. Some of the stones were large and heavy; it would be interesting to observe how the birds set to work to move them, and how they put the roof on. I have been told that they rake up a mound of stones with their powerful wings, in such a way that by removing some of those underneath, they leave the roof above them." Of course, this is obviously impossible, some of the stones being a great weight; the fact is, that these little stone huts are put up all over the top of the island by the Portuguese fishermen for the birds to nest in, so that the young may be more easily obtained when they visit the place in autumn. This is commonly done also in the Canaries.

The only other bird of this genus, so far as we ascertained, that visit these islands is Gould's Little Shearwater (*Puffinus assimilis*), the same species that we found breeding at Porto Santo. Here also we procured young in various stages, and one late egg almost fresh; it is large for the size of the bird, and the shell is pure white, and perfectly oval in shape, the two poles being equally rounded. We never saw much of these birds, though one flew into the camp one night; but during the daytime there were generally some to be seen at sea, often in company with the

Mediterranean Shearwater. The note of these birds we never ascertained, and when seen on the wing they were always silent so far as we heard.

Perhaps the most interesting met with was the White-breasted Petrel (*Pelagodroma marina*), a lovely bird, with all the under parts, as well as the forehead and wide eyebrow stripes, snow-white, the upper parts dark sooty grey, and with very long black legs and yellow middles to the webs of the feet. This species was previously known to inhabit the Australian seas, and one or two eggs were obtained many years ago by Gould on the west coast of Australia. One or two specimens had from time to time been obtained off the Canary Islands, and one was recently picked up dead on Walney Island after a great storm, but these were merely regarded as accidental stragglers. We first observed and recognised with pleasure these beautiful Petrels as we neared the Salvages, when numbers were seen flitting along close to the surface of the sea, with their long legs dangling beneath them and just touching the water. Now they would be lost sight of in the hollows between the huge Atlantic rollers, now reappear, closely following, with their graceful, easy flight, the undulating waters. On the afternoon of our arrival, we found an egg of this bird in what we at first mistook for a rabbit burrow, but it was unfortunately broken by one of the men. This, however, opened our eyes, and we subsequently found that large colonies of the White-breasted Petrel were breeding on the flat top of the island, in burrows dug out in the sandy ground, and partly concealed by the close-growing ice-plant. It was very unpleasant walking over these breeding-grounds, which occupied considerable areas, for the ground was honey-combed in every direction with burrows, which gave way at each step, and one's boots rapidly became full of sand. By thrusting one's arm into one hole after another we soon procured a fine series of specimens, accompanied in most cases by an egg, for we had evidently just hit off the breeding season, and most of the birds having laid their single egg were just commencing to sit. The egg is white, more or less finely spotted, and often zoned towards the larger end with dark purplish red dots. Both sexes take part in the incubation, for out of twelve birds captured on the egg, three were males. While thus engaged, we found quite a number of dead birds and sucked eggs, evidently the work of Mice, for their droppings were

to be seen all about the burrows, and the marks of their teeth on the empty shells were unmistakable. The birds, some of which were quite freshly killed and almost untouched, were invariably done to death by being bitten at the nape of the neck, and in some cases part of the brain had been eaten. It seemed curious that these comparatively small Mice should be able to kill a bird several times larger than themselves, and provided with a fairly strong hooked bill; but no doubt the Petrels get caught in the end of their burrow, and being terrified, do not even try to defend themselves. We obtained no young of this species, and the most advanced eggs were at most but half incubated on April 27th. Almost more interesting than the White-breasted Petrels was the square-tailed, white-rumped Petrel (*Oceanodroma cryptoleucura*), of which we obtained but a single example, caught at night with a lantern at Great Salvage, though we saw several flying over the neighbouring seas from the deck of the 'Pedro.' This bird had not yet come to shore to breed, and the only egg we obtained was taken at Porto Santo, near Madeira, in the month of June. It had always been previously supposed that the only small white-rumped Petrel met with in these seas was Leach's Fork-tailed Petrel (*O. leucorrhoa*). That this bird also occurs there is certain, for we have seen a specimen obtained at the Canaries by Mr. Meade-Waldo, but it appears to be merely a straggler so far south; and certainly the square-tailed species is the bird that has generally been mistaken for it. *O. cryptoleucura* was described a few years ago from the Sandwich Islands, and no one had any idea that it was also found in the Canary seas, so that this discovery is a matter of considerable interest to ornithologists. The birds obtained at St. Helena also belong to this form, and not to Leach's Petrel, as has been generally believed. It may be useful to state the main differences between the two.

O. leucorrhoa has the tail *deeply forked*, the outer feathers being much longer than the middle pair, and dark to the base; while the upper tail coverts are uniform white, *not* tipped with black.

O. cryptoleucura has the tail *nearly square*, the outer feathers being only slightly longer than the middle pair, the basal part of the outer feathers is white, and the upper tail coverts are white, *tipped with black*.

The only other Petrel met with was the brownish-black

Bulwer's Petrel (*Bulweria bulweri*), a common bird in the Madeira and Canary seas. We were too early for their eggs, but obtained one taken at Porto Santo in the month of June. The call of this bird is very fine, and was frequently heard at night, a pleasant contrast to the harsh voices of the Great Shearwaters. It consists of four higher notes and a lower, more prolonged note, the whole repeated several times, and uttered in a loud, cheerful strain.

A few pairs of Kestrels and Short-eared Owls were evidently breeding, and we used to see them every day quartering the ground in search of their prey, and it pleased us to think that at least some check was being put on the Petrel-destroyers. About a dozen pairs of the Yellow-legged Herring Gull (*Larus cachinnans*) had nests about the rocky points, but we only found one with eggs, and these were on the point of hatching; the other nests were either empty or contained downy young. These too had their enemies of some sort, for a nest which contained three young the day we found it, had only one remaining a few days later. This may have been the work of other Gulls, but we could not help suspecting the great hook-billed Pardellas of being the culprits; for hundreds of them used to come out of the rocks, or leave their stone houses on the top of the island just before sunset, and fly rather low all over the stony plateau, making the beautiful evening hideous with their incessant cries of ia-gow-a-gow-a-gow; they certainly appeared to be in search of food of some sort, but we had no means of proving our suspicions.

One of the most numerous, as well as the tamest, of small birds on Great Salvage was the Berthelot's Pipit, which is common at Madeira, Porto Santo, and the Canaries. These little birds were our constant companions, and one or two of them were almost always to be seen running about among the stones and ice-plants, generally within a few yards of one's feet. When we arrived at Great Salvage they had not begun to breed, and were generally met with in small companies of three or more; but on the last days of our visit we noted that many had evidently paired, and one or two birds were seen going about with nesting materials in their bills, so the breeding season must have been just commencing. They apparently rear a second brood in the autumn, for several of the birds we shot were in the freshly

moulted plumage of the immature bird, with the feathers of the back, wings, and tail, widely edged with buff; while in the old birds these parts were in a much worn condition. The only other small birds we got specimens of were Swifts (*Micropus apus* and *M. unicolor*), Swallows, which arrived during our stay in great numbers, many entering our men's stone huts after dark, House Martins, and Sand Martins. Besides these, there were a few pairs of Common Terns (*Sterna fluviatilis*), and one day we saw a pair of Turtle Doves fly from the face of a precipice, startled by a shot—the death-knell of a Pardella; while on another occasion, having reached the summit of the island, we suddenly came face to face with a Hobby, and though no attempt was made on its life we were able to identify it beyond a doubt.

The Reptiles in the island were few in number, only two, the Long-tailed Lizard (*Lacerta galloti*), and a small black Gecko (*Tarentola delalandii*), both species being inhabitants of the Canary Islands. We brought back a number of these, both alive and in spirit, and their capture was an endless source of delight to our Spanish fishermen, who became great adepts at finding them, and generally managed to catch them without pulling their tails off! Francisco was indeed indefatigable, and would cheerfully turn over hundreds of heavy stones in a morning in search of reptiles, spiders, millipedes, and such like, being quite as excited over the capture of a new spider for our collection as we were ourselves. Poor man! he always walked bare-foot, and very soon found to his cost that even his horny soles were not proof against the sharp volcanic rocks, for his feet were always more or less cut and bleeding by the time we returned to camp. Every day, weather permitting, some of our men went fishing, but though we obtained a good many species of fish, most of which, especially the sea-perch and eels, were good enough for the table, and various other inmates of the deep, we got nothing of any special interest, all belonging to species known from the Madeira or Canary seas. Among the shells collected we obtained a fine series of the handsome pink land-snail (*Helix ustulata*, Lowe) which is peculiar to the Salvages. Of Lepidoptera, the Painted Lady was very common, varying much in size and colour; and the Gamma Moth, *Plusia gamma*, was constantly to be seen hovering over the white flowers of the ice-plant. Having only a very small boat, we were never able to go very far from shore, and it was

not until the return of the 'Pedro' that we were able to pay a second visit to Great Piton. As we were obliged to catch a steamer at Las Palmas, which was due to leave for Madeira on May 1st, it had been arranged that the 'Pedro' should return for us in good time, and she turned up about four o'clock on Sunday evening, April 28th. Having packed up all our previous collections and baggage, we left Great Salvage, with many regrets, at seven o'clock the following morning. Again we were fortunate in getting all our belongings safely on board, for we had anticipated trouble, as the cases containing specimens preserved in spirits were extremely heavy, requiring several men to move each one, but with a little care we avoided any mishap. On leaving the shelter of the island we ran before a strong wind and following sea; and as we approached the Great Piton, saw that the great rollers were breaking heavily on the weather coast, but by running round to the south side we landed without much difficulty. Of all the lovely natural flower-gardens we have ever seen this island is the most beautiful; and we would gladly have spent a few days camping here, though the collections, from a zoological point of view, might not have been very important. The Salvage Mouse is not found here, and the only mammal is the Common Rat, which had, of course, been imported on some ship; and though we saw no trace of them except a skull, our men assured us that they were plentiful enough.

The birds observed were Whimbrels, Little Ringed Plovers, Turnstones, and a few pairs of the Common Tern, as well as the Kestrel, House Martin, Turtle Dove, and a Goatsucker, shot just as we were leaving the island. What interested us most, however, were the flowering plants, which literally covered the flat sandy surface of the island, making the whole place a blaze of colour. One of the most conspicuous was the Pedosia (*P. paivæ*), a kind of straggling trefoil, only met with on this little islet; it was very plentiful, and its beautiful yellow flowers mingled everywhere with the Sea Lavender (*Statice pectinata*), which varied in tint from almost white to pale violet, and reminded us of a creeping Heliotrope in its general habit. We dug up some of the enormous bulbs of a Scilla, probably *Scilla hyacinthoides*, but as it was not then in flower, it remains to be seen, should it live through the winter, what species it really belongs to. We feel sure that any botanist visiting the Salvages, and Great Piton in particular, will

be well rewarded for his trouble; but he must take plenty of water as well as food with him, for there are no springs of any kind on this sandy islet. In this respect Great Salvage is better provided, but we only used the water for cooking, though our men drank it with impunity.

Much as we wished to do so, we did not land on the Little Piton, though our pilot informed us we might have managed it that day, as the weather was sufficiently favourable. Our captain was anxious to be off, and we were afraid of missing our vessel at Las Palmas—a needless fear, as it turned out, for she remained taking in fruit for two days after we were supposed to sail, to our infinite disgust, as we hardly dared leave the mole, never being certain when the last lot of tomatoes or bananas would arrive. Our being unable to visit Little Piton was the more to be regretted, for none but the Spanish fishermen—and very few of them—have ever landed there on account of the surrounding dangers. Our pilot had been there, and told us that there were neither rats nor mice, and consequently colonies of the White-breasted Petrel bred there unmolested, whilst the small white-rumped species (*O. cryptoleucura*), mentioned above, was also common. Money, or rather the want of it, is said to be the bane of one's existence, but want of time must often be equally annoying to the scientific explorer.

Leaving Great Piton at 11 o'clock, and having bent our awning on to the boat-hook and made a top-sail of it, we ran straight for Las Palmas before a strong wind and following sea, arriving at our destination by 9 o'clock the next morning. Here we settled up our affairs, but were able to do little or no collecting. On at last reaching Madeira, several days later than we expected, one of our party being obliged to return to England, we made a week's trip to Rabacal, Caramujo, the Ribeira do Inferno, and Fanal, in the wildest parts of the north of that island, and were favoured with glorious weather and luck in our collecting; but the telling of our Salvage adventures has already taken so long that we must defer giving an account of this charming tour till some later date. Altogether we obtained during our three weeks' collecting over 200 bird-skins, as well as a tolerably complete collection of all the other natural objects met with, and, having brought them all safely back to England, felt that, besides having thoroughly enjoyed our trip, we had not laboured in vain.

THE HARVEST MOUSE.

Mus minutus, Pallas; *Mus messorius*, Shaw.

BY THE EDITOR.

ALTHOUGH spread over a great part of Europe as far as Western Asia, where it was found and described by Pallas as *Mus minutus*, the Harvest Mouse is generally reputed a species of rare occurrence. Several circumstances may account for this. Its very small size and the rapidity of its motions often cause it to be overlooked, or to be mistaken for the young of the Long-tailed Field Mouse, *Mus sylvaticus*. For the first published account of it as indigenous to this country, we are indebted to Gilbert White, although it appears to have been previously seen by Montagu in Wiltshire (*cf.* Trans. Linn. Soc., vol. vii. p. 274). White communicated his discovery to Pennant (Nat. Hist. Selborne, Letter xiii.), who published it in the second edition of his 'British Quadrupeds,' and thence it has been copied with but little addition by almost every writer on the subject of British Mammalia.

It has been reported from so many widely separated English counties that it may be regarded, at all events, as generally though locally distributed, and perhaps often overlooked, in most of the midland and southern districts. In Northumberland and Durham, according to Messrs. Mennell and Perkins,* there are but few recorded localities for this species, but among them the following is worthy of note from its great elevation. Mr. William Backhouse has taken it at St. John's, Weardale, 800 feet above the level of the sea.†

In the district of the English lakes, according to Mr. Macpherson, it is extremely rare. Many years ago a typical nest was found at Blackwell, and in 1888 a specimen was secured at Silloth, but these are the only two instances noted of the appearance of this mouse in Lakeland.

In Yorkshire, according to Messrs. Clarke and Roebuck, it is very irregularly and thinly distributed. A specimen with the nest affixed to the stems of *Centaurea nigra* was long preserved

* "Catalogue of the Mammalia of Northumberland and Durham," Trans. Tyneside Nat. Field Club, vol. vi. (1864), p. 171.

† *Op. cit.* vol. iv. p. 94.

in the Chester Museum, and said to have been taken in the neighbourhood (Newstead, Proc. Chester Soc. Nat. Sci. vol. iv. p. 248). There appears to be good authority for locating the species in the following counties:—Lancashire (Byerley), Staffordshire (Garner and Masefield), Leicester (Harley and Widdowson), Norfolk (Lubbock and Gurney), Suffolk (Rope and Moor), Cambridgeshire (Jenyns), Warwickshire (Tomes), Worcestershire (Hastings), Hertfordshire (Bond), Essex (Laver), Kent (Collingwood), Sussex (Harting), Hampshire (Gilbert White), Isle of Wight, Shanklin (A. G. More),* Wiltshire (Montagu), Gloucestershire (Knapp, Witchell), Devonshire (Montagu, Rowe, Bellamy, Parfitt), and Cornwall (Couch and Rodd).

In Scotland, according to Macgillivray (Brit. Quad. 1838, p. 257), it has been met with in Aberdeenshire, Fifeshire, and near Edinburgh. Thomas Edward has added Banffshire. As regards Edinburgh, Mr. William Evans, Secretary to the Royal Physical Society, who has paid close attention to the mammalian fauna of that district, reports that his efforts to obtain specimens have been singularly unsuccessful, and considers that it must be very local and nowhere numerous. Mr. Small, taxidermist, of Edinburgh, many years ago received two from Banffshire, and in August, 1885, Mr. Evans found a nest of this mouse in a tuft of coarse grass growing under a hedge surrounding a cornfield behind Aberlady, in East Lothian. It was about eighteen inches above the ground, and was supported entirely by the stems of the grass and a few twigs of the hedge. In 1870 he was informed by Mr. D. F. Mackenzie, factor, of Mortonhall, near Edinburgh, that he had obtained a number of compact round nests among a heavy crop of oats on the home-farm there. They were placed one or two feet from the ground, and belonged to a small reddish mouse which he saw more than once sitting on the heads of the corn.†

As regards Ireland, Bell states (p. 291) that “it would seem to be very rare there, but through the kindness of Dr. Kinahan

* This species is included in Venables' 'Guide to the Isle of Wight,' in a list of the Mammalia by A. G. More; but in the subsequently published 'Guide' by Jenkinson (1876) it is stated (p. lxi) that “Mr. Bury was once informed that a few specimens had been obtained near Shanklin, but it is possible that the young of *Mus sylvaticus* were mistaken for it.”

† 'Mammalian Fauna of the Edinburgh District,' 1892, p. 79.

he is enabled to record it as an inhabitant of that country." On this it may be observed that Thompson thought it could not with certainty be included in the fauna of Ireland, while the late Mr. A. G. More ascertained that the species referred to by Dr. Kinahan was the young of *Mus sylvaticus*.

The accurate account given of it by White should be read by every one who desires to know something of its habits. He measured one, and found that from nose to tail it was just $2\frac{1}{4}$ in. with a tail 2 inches long. Two of them in a scale weighed down just one copper halfpenny, which is about a third of an ounce avoirdupois, or one-sixth the weight of an adult common House Mouse. The average dimensions of seven adults, irrespective of sex, taken in Suffolk by Mr. Rope, were as follows:—Length of head and body, 2 in. $7\frac{1}{2}$ lines; length of tail, 2 in. 1 line; total length, 4 in. $8\frac{1}{2}$ lines.

The colour of the Harvest Mouse, though very beautiful, is in most works given in rather general terms, without going much into details, and gives the idea of a uniform tint prevailing on the upper parts; whereas, in all the specimens which have been examined, the bright sandy yellow or orange-fawn of the upper part was purest and brightest towards the tail; being focussed (so to speak) on the hind-quarters just at the root of the tail, and extending underneath as far as the vent. This bright but delicate tint shades off gradually, above, into the light yellowish or orange-brown which is the prevailing colour of the upper parts, the latter hue becoming again brighter and lighter as it extends downwards to meet the white of the under parts. The fur of the cheeks and that surrounding the ears is also bright sandy or orange; the hams are nearly always of that colour, varying, however, in intensity in different individuals. There is considerable variation, too, in the colour of the upper parts, the brilliant fawn tint being more or less wanting in some specimens, whereas in others it is more generally diffused, and less concentrated on the hind-quarters, being apparently most pronounced in the female sex. The long and beautifully formed flexile feet are covered with fine hairs of a yellowish colour, shading off on each side to white, the under side being naked. The tail is scantily furnished with short hairs as far as the extremity.

With regard to the colour of the young, I remarked in the

case of some which were born in confinement, and whose parents were captured in a wheat rick in Sussex, that even when almost as large as the old ones they were not nearly so red. Indeed, until the beginning of December they resembled a House Mouse in colour. About that time, however, they began to change visibly, the hinder quarters, from the root of the tail upwards, becoming rufous before any other portion of the body. This change of colour in the winter I was not prepared for, as I should rather have expected the change from brown to rufous to have taken place in the spring.*

The period of gestation is believed to be the same as with the Long-tailed Field Mouse, namely, three weeks, the number of young, which are born blind, varying from five to eight.

Mr. E. C. Moor, writing from Woodbridge, Suffolk, says:—“During the summer of 1883, especially at harvest-time, several nests of the Harvest Mouse were taken by me, mostly from barley-fields, being placed upon the laid barley. Almost all contained young ones, numbering from six to eight; and it was surprising to see how eight fair-sized mice could possibly live in a nest hardly as large as an orange.”

During the summer months the Harvest Mouse lives in the open country, evincing a partiality for the borders of ditches in proximity of corn-lands, building its globular nest amongst the tall rank herbage growing in such situations, or in low bushes close by. Mr. Rope found one in Suffolk, in a low blackthorn bush growing by the side of a ditch, and another in a plant of the common broom.† Prof. Schlegel discovered one amongst the branches of a shrub (*Hippophaë rhamnoides*) on the sand-dunes in Holland, and a second in oak-scrub about a mile from the sea. Other plants observed by him to be selected for nesting in were *Rubus fruticosus*, *Rumex acetosa*, and *Epilobium*.

The nest is composed of grasses, blades of wheat, or split leaves of the reed, and is suspended among the living plants at a little distance from the ground. It is lined with short pieces of grass split by the little animal's teeth, and thus rendered softer and more available for the purpose. A nest found by Mac-

* A full account of the habits of these mice as observed in confinement, and the mode of treatment adopted with them, was published in 'The Field' of Jan. 2nd, 1875.

† Zool. 1880, p. 57.

gillivray in Fifeshire was composed of dry blades of grass in the midst of a tuft of *Aira cæspitosa*. In Essex Dr. Laver reports that he finds these small mice more often in corn stacked in the fields than in that which is carted home, but that when the harvest is carried they find their way to the ricks, evincing a partiality for wheat, but eating oats and barley too when wheat fails them. In Suffolk Mr. Rope has found them as often in stackyards attached to farm buildings as in outlying stacks, and this has been the writer's experience in West Sussex. After the stacks have been threshed, they often remain in the straw throughout the winter.

That the Harvest Mouse, during the summer months, constructs for itself a bird-like nest suspended amongst the stalks of growing plants has of course been long known—in fact, ever since Gilbert White, in 1768, announced the fact in a letter to Pennant as above noticed. He also remarked that “in the winter they burrow deep in the earth and make warm beds of grass, but their grand *rendezvous* seems to be in corn-ricks, into which they are carried at harvest. A neighbour,” he adds, “housed an oat-rick lately, under the thatch of which were assembled near a hundred, most of which were taken, and some I saw.”

A curious divergence of habit in this little creature when in its winter haunts has only of late years been announced. The late Prof. Schlegel, of Leyden, with whom it was once the writer's privilege to spend a week, discovered the interesting fact that it sometimes builds a winter nest, into which at the cold season it retires. A very pleasing account of his observations on this point was published in the periodical ‘Notes from the Leyden Museum,’ vol. iii. pp. 23–28 (1881), and will be found reprinted in ‘The Zoologist’ for that year (pp. 233–237).

The locality in which this discovery was made is situated at a distance of about two miles from Leyden, in the neighbourhood of the Castle of Endegeest, celebrated as having served as a refuge to the philosopher Descartes after his exile from France. Here, on the right-hand side of the road leading to the village of Rynsburg, not less celebrated for its abbey than for being the residence of Spinoza, there is to be found a ditch some quarter of a mile in length and six paces in width. Part of the border of this ditch was grown over with reeds. Close observation soon

showed that these reeds actually contained about fifty nests of this little mouse. During the breeding season these were of the usual globular form, of the average size of a man's fist, and showing near the top a small circular opening for the entrance of the little animal. But the winter nests were quite different. These were composed of various mosses, and were attached to and between several stems of reeds, exactly like the nests of the Reed Warblers, but more fusiform, of from six inches to a foot in height, and from three to four inches in diameter. They showed no inlet, and were placed at the height of a foot over the water's level. The animal when entering had to remove the upper part of the covering, which was less densely interwoven, and was concealed between the moss. It appears evident that the building of these nests was a just calculation of being safe against the danger of drowning, in the same way that Swans and Moorhens have been observed to build their nests in time of flood above the reach of the rising water. Some of the mice in the case above noticed went a step further, and adapted to their own requirements the deserted nests of aquatic warblers, which they covered with a cap of grass.

The manner of feeding is very like that of a Squirrel, sitting up on the haunches and holding the food in the fore paws. Mr. Rope has thus described the mode in which a grain of wheat is manipulated:—"Sitting up and holding the grain in a horizontal position between the fore paws (one being placed at each end), the little animal begins dexterously and rapidly turning it round, like a wheel on its axle, at the same time applying it to the edge of his sharp incisors, and by their means slicing off the outer skin or bran, and letting it fall like the shavings from the tool of a wood-turner at his lathe, to whose operations the whole process bears a striking resemblance; nor does he begin eating till he has reduced the grain to a perfectly white and almost cylindrical body." On one occasion Mr. Rope was surprised to see one devouring the seed of the broom.

Mr. J. H. Gurney has remarked (Zool. 1884, p. 112) that the Harvest Mouse in confinement is very fond of Canary seed, as much so, he says, as of wheat; and in spring he found that they appreciated twigs of hazel, the leaf-buds and partly expanded leaves of which they devoured with great avidity. A bunch of fresh moss with the earth adhering to the roots was also a great

treat to them. They eagerly burrowed into this, probably in search of small insects. As to its insectivorous propensity, the Harvest Mouse has been found by many observers to be partial to flies of several kinds, which they catch very adroitly, and without the least apparent effort or exertion. The Rev. W. Bingley, in his 'Memoirs of British Quadrupeds,' has given an interesting account of the Harvest Mouse in captivity, and thus describes its dexterity as a fly-catcher:—

“One evening as I was sitting at my writing desk, and the animal was playing about in the open part of its cage, a large blue fly happened to buzz against the wires; the little creature, although at twice or thrice the distance of her own length from it, sprang along the wires with the greatest agility, and would certainly have seized it had the space betwixt the wires been sufficiently wide to have admitted her teeth or paws to reach it. I was surprised at this occurrence, as I had been led to believe that the Harvest Mouse was merely a graminivorous animal. I caught the fly, and made it buzz in my fingers against the wires. The mouse, though usually shy and timid, immediately came out of her hiding place, and, running to the spot, seized and devoured it. From this time I fed her with insects whenever I could get them, and she always preferred them to every other kind of food that I offered her.”*

On this subject Mr. Rope, writing also of a mouse of this species observed in captivity, has remarked (Zool. 1884, p. 57):—“On a fly being put into the cage, the mouse, instead of rushing about after the insect, appears at first to take no notice whatever of it; but when the latter, in buzzing about the cage, approaches within its reach, in the twinkling of an eye he has it firmly grasped in his paws, and it is devoured almost before one can realize the fact of its being caught; the wings and legs are generally rejected. These mice will probably devour many other insects, and I have seen woodlice eaten by them.” Even a cockroach, large as it is, fares no better, although there is a certain amount of hesitation in seizing this more formidable-looking prey.

Although an accomplished climber, every movement being performed with ease and grace, the Harvest Mouse has not the extraordinary speed and activity so characteristic of the House

* This observation is confirmed by the Rev. P. Bartlett (Zool. 1843, p. 287), who adds that it drinks water eagerly; and I have seen those which I kept in confinement lap milk with avidity; the tiniest tongue and the most miniature process of lapping imaginable.

Mouse, and on this account when discovered it is more readily captured. Its prehensile tail is a noteworthy feature, and it is of great service to the little animal when descending the corn-stalks. My little captives, when going round in the wheel provided to give them exercise in their cage, invariably made use of their tails to steady themselves upon the slender wire, and lashed it round the wire to bring the wheel to a standstill. The appearance presented when the tail is used for grasping is accurately represented in the figure of this animal which accompanied the article on the Weasel (Zool. 1894, p. 454), to which active little mouse-hunter it must often fall a prey.

NOTES AND QUERIES.

Wild Animals killed in Norway in 1894.—The official list of birds and beasts of prey killed throughout Norway last year (1894), and on which the Government rewards were paid, has been recently published. The details are as follows:—

Provinces.	Bears.	Wolves.	Lynxes.	Gluttons.	Foxes.	Eagles.	Hawks.
Smaalenene	—	—	—	—	332	2	315
Akershuus	—	—	1	—	391	1	219
Hedemarken	—	—	—	1	725	12	460
Kristian	11	—	—	—	628	129	314
Buskernd	6	—	2	—	471	65	324
Jarlsberg and Larvik	—	—	—	—	323	9	366
Bratsberg	9	—	14	—	413	64	347
Nedenaes	3	—	2	—	250	15	258
Lister and Mandal	2	—	—	—	220	7	83
Stavanger	—	—	—	3	214	26	233
S. Bergenhuus	—	—	—	1	640	36	386
N. Bergenhuus	8	—	2	4	705	73	203
Romsdal	4	—	2	14	385	71	184
S. Trondhjem	—	5	6	2	481	55	374
N. Trondhjem	8	15	8	4	341	80	311
Nordland	3	1	7	6	703	321	239
Tromsö	1	—	—	1	422	70	75
Finmarken	2	16	—	10	1002	45	36
Total	57	37	44	46	8646	1081	4727
For the previous year the numbers were	72	50	56	40	11,400	969	4846

The reward for killing a Bear is 20 kroners, and so also for a Wolf, Lynx, or Glutton; for a Fox, 4 kroners; for an Eagle, 2 kroners, and the same for Goshawks.

MAMMALIA.

The Field Mouse of the Outer Hebrides.—I wish to slightly amend my description of the Field Mouse of the Outer Hebrides (p. 369), and prefer to call it a sub-species of *Mus sylvaticus*, as it is clearly the local representative of that animal. The name will therefore be *Mus sylvaticus hebridensis*. I shall in so naming it stand with the trinomialists; but I see no other course, for I hold that there must be some link to group the species of the large genus *Mus*. Having neglected to mention the type, I now select the first specimen in the table on p. 370, which is now in the British Museum, Reg. No. 95, 10, 25, 1, collected and presented by myself.—W. E. DE WINTON.

The Field Mouse of the Outer Hebrides.—In the article by Mr. W. E. de Winton (p. 369) upon this new variety of *Mus sylvaticus*, he ignores the fact that it has already been described by me (Journ. Birmingham Nat. Hist. Society, April, 1895, p. 135), and again briefly in my observations on the fauna of St. Kilda (Zool. Aug. 1895, p. 281), from a specimen taken from that out-of-the-way locality in May, 1894, and forwarded upon my return to the Editor, and by him to Mr. Oldfield Thomas. I think that at present no definite conclusion should be arrived at until further specimens have been procured from various other islands along the west coast and north of Scotland, including the Inner Hebrides, Orkney, &c., as well as the adjacent mainland. Until this has been done it seems rather premature to describe it as a new species. I append a copy of my former note above referred to (Journ. Birm. Nat. Hist. Soc.), which ran as follows:—"The Common Mouse we trapped constantly; a slight difference was noticed in its coloration from those found with us. Unfortunately only one specimen of the Long-tailed Field Mouse was taken, this being by far the most interesting of all our captures; it is probably the type resident in these islands, and differs from our ordinary form by the adult having the fur on the back greyish-brown similar to the young of our Long-tailed Field Mouse, instead of reddish-brown as in our adult type, and on the belly the fur has a lovely pink shade instead of pure white. The whole of the mice taken are now in the British Museum, and I might add a supply of traps, &c., has been sent out by the authorities to secure, if possible, further specimens. I hope in the future, if I am spared for another visit, to be able to get additional specimens. The Outer Hebrides are likewise being trapped to obtain, if possible, any intermediate forms."—J. STEELE ELLIOTT (Dixon's Green, Dudley).

Natterer's Bat in Yorkshire.—On August 9th Mr. Alfred Kebbell kindly gave me a living specimen of *V. nattereri*, which had flown into his house in this village on the previous evening.—OXLEY GRABHAM (Flaxton, York).

The Lesser Shrew and Water Shrew in Yorkshire.—In August last I had brought to me a female Lesser Shrew, *Sorex minutus*, and when preserving it found it to contain five foetal Shrews in an advanced stage of development. In September I picked up dead on a footpath a beautiful melanic variety of the Water Shrew, *Crossopus fodiens*, with the under parts almost as dark as the upper, but unfortunately it was much too far gone for preservation.—OXLEY GRABHAM (Flaxton, York).

Bank Vole in Kent.—While snail-hunting round Canterbury last August I came upon a nest of young Bank Voles, among some refuse in a hedge-bank. I had one in my hands for some minutes, and am sure of its identity. I do not remember its being recorded in Kent hitherto, but I believe it to be very common from the number of runs seen in the neighbourhood.—LIONEL E. ADAMS (77, St. Giles Street, Northampton).

BIRDS.

The Rate of Flight in Birds.—In the October number of this Journal (p. 378) the Editor adds an interesting and valuable note to Mr. Butterfield's communication on this subject. On the authority of Herr Gätke (English edition, p. 470), he remarks that in the case of the American Golden Plover, *Charadrius virginicus*, flocks have been met with at a distance of 400 geographical miles east of Bermuda, flying in a southerly direction on their way from their breeding-places in Labrador to Northern Brazil. The distance between these points is 3200 miles, and since there is no point between on which they could alight for rest, they are obliged to perform the entire journey in one uninterrupted flight. The velocity in fifteen hours would amount to 212 miles per hour. It is not, however, strictly accurate to state that the American Golden Plover has no point in this long journey at which it can alight for rest. A glance at an atlas will show that the same meridian of longitude passes through East Labrador and the island of Barbados, the most easterly of the Lesser Antilles, and exactly in the line of flight of the migratory hosts passing from Labrador and regions further to the north to South America. If a reference be made to a paper on the birds of Barbados, published in 'The Ibis' for 1889, it will be found that I have therein made some observations on the large number of American Golden Plover that annually alight on that island during the months of August, September and October, whilst stragglers appear as late as November. The first arrivals are invariably dark-breasted birds, showing that the old birds precede the young, and the first arrivals are nearly all males. Great as are the numbers of this species that do alight in Barbados, attracted by decoy birds purposely set out as lures, and by the call-note of the Plover, admirably imitated by the island gunners, yet the flocks that descend are a mere fraction of those that pass over. Waiting at the decoy-huts for flocks to come down to the

lures pegged out on the most attractive spots of green sward, carefully prepared by pools of water, I have watched countless numbers of Plover passing overhead on their southward migration. On some days no allurement could induce them to descend to the tempting spots prepared for their destruction, and their sharp whistle and rapid air-cleaving flight showed no symptom of fatigue; the major portion of these great flocks continued their southward flight from morn to eve without circling or gyrating over the island. One might imagine that to these migrants, compassing an ocean flight of 3200 miles, nothing would be more attractive than the island of Barbados, looking like a Garden of Eden set in that waste of waters. But it does not appear that such is the case, nor that there is any absolute necessity, born of fatigue, for the Plovers to break their journey by resting on this island, and that it is rather a matter of volition, and not weariness, when they do alight on the island of Barbados.—H. W. FEILDEN (Wells, Norfolk).

Rate of Flight of Birds on Migration.—This is a subject on which there is, and must continue to be, much divergence of opinion amongst naturalists. The very remarkable statements made by Herr Gätke, in his chapter “Schnelligkeit des Wanderflugs” (‘Die Vogelwarte Helgoland,’ p. 65), appear to be incredible to naturalists. Yet there is much to be said in support of his estimates of speed of birds in full migratory swing. I remember some years since, when in Heligoland, Mr. Gätke mentioned the fact, now recorded in his book, that repeated observations had shown that, in the spring migration, Plovers, Curlews, and Godwits, flying across the island at a rushing speed, reach the oyster-beds, 22,000 feet to the east, within the space of one minute, or at the rate of 240 miles an hour. Professor Newton, in his excellent article on “Migration” (‘Dictionary of Birds,’ Part II. p. 566, foot-note), commenting upon this statement, says:—“Yet, to do Herr Gätke justice, I must admit his general contention to be sustained by a good observer, Mr. Oswald Crawford, who states (‘Round the Calendar in Portugal,’ pp. 154–156), in regard to the wonderful speed with which Turtle Doves fly on migration in autumn, that he once made a calculation to arrive at the pace of their travelling; ‘but the result came out in such surprising figures’ that he would not set them down. He convinced himself, however, that, if the flight was continuous, Turtle Doves leaving ‘Kent or Surrey at dawn, might easily be the birds that a few hours later were skimming over the Portuguese pine-forests on their way to Central Africa.’” The flight of driven Grouse or Partridge, Teal rushing down to water, belated Starlings flying to their roosting-places—that is, birds *with an impulse upon them*—probably greatly exceeds the speed of our fastest express trains. Man’s ordinary progression is a walk, or a maximum of four miles an hour, but when trained, or put to it, he will do his mile in a few minutes. Migrating birds seen coming in from the sea in the daytime,

as Rooks, Starlings, and Larks, certainly do not seem to travel at an abnormally high rate of speed. I myself have repeatedly calculated the flight as not exceeding forty to fifty miles an hour, and often less. It is possible, however, that on nearing land and the end of their journey, final or temporary, they descend from a high altitude where, for hours together, a much greater rate of travel has been maintained,—slacking speed, or, if I may use the expression, shutting off steam, as they near the terminus. Of course these remarks apply to birds only crossing the North Sea, or making long and continuous journeys in the spring and autumn. Our small summer guests, the Chats, Warblers, and Flycatchers, to a great extent move south by a hedge-to-hedge migration, in slow stages, till they reach the south or south-east coast, crossing the English Channel, again to resume the land journey across sunny France and sunnier Spain to the land of endless summer. — JOHN CORDEAUX (Great Cotes House, R. S. O., Lincoln).

Origin of the terms “Cob” and “Pen.”—In your article on this subject (pp. 372—374), the word “cob” is taken to refer solely to the “knob” at the base of the upper mandible, and in that case may have meant merely a projection. The Swan, therefore, would be so called from its most characteristic feature. It is worth noticing, however, that some of the provincial glossaries explain a “cob” as a stone-horse as contrasted with a gelding or mare; and certainly “cob,” in some English dialects = *testiculus*. I think, however, your explanation is probably the right one. With regard to the derivation and original meaning of “cob,” the question is very difficult. Of course *cob* or *cop* is the word answering to *knopf*, and both these words have probably gone through the same development. The words mean (1) a bowl; (2) a head; (3) a prominent or projecting point: the question is, what is the order of the development of these meanings. Kluge, sub voce *knopf*, seems to think that there may have been for *knopf* a Germanic meaning of head; although *haupt*, the philological equivalent of *caput* and of our word *head*, is the true O. German word. A very probable theory is that the word originally meant a bowl, and then came to be employed for head (cf. *testa* and *tête*). In any case we find in M.E. *copp* for *top*; *coppod* (capped = *cristatus*) of snakes. The French word *coiffe*, which probably came into France through the Italian *cuffia*, points to the existence of an old German word “*kupfe*,” “head covering,” from which word it sprang; and this fact shows that this use of the word is very old. The word *cob* in English seems sometimes to take the metaphorical meaning of round and projecting; sometimes of something large. In Welsh we have *cop* for a head; and in Lancashire *cop* is used for a low hill. The well-known Dutch *kopje* of the Boers in South Africa is, of course, the same word. “Cob” was used in Hoccleve (1420), (see Murray’s Dict. s. v. “Cob”) for a leading man, as we say, a “big” man. A cob loaf would seem to mean

a rounded loaf (in 'Troilus and Cressida,' ii. 1, Ajax uses the word "cob loaf" as a term of reproach to Thersites), just as "cob" is commonly used for a strong, stout, stumpy horse. On the other hand, in "cobnut" we probably have the idea of size indicated, in contrast with filberts or hazelnuts. I may notice that the term "a cob of hair" for a tuft of hair is still used in Cornwall, apparently a survival of the old Celtic word in its Celtic sense. Mr. Cross, the animal importer, of Liverpool, informs me that "Cob" and "Pen," as applied to Swans, are regular terms of the trade, used in all parts of England where Swans are bought and sold. Browning, in his 'Sordello,' probably following Ben Jonson in his 'Catiline,' uses the term "Cob-swan." The word *busk*, which you have used to denote the peculiar action of a Swan in arching or bushing out the wings over the back, is (like *bask*) interesting as containing the Scandinavian passive formation, *bua*, to prepare; *buask* (for *bua-sik*), *se préparer*. *Bush* is said by Prof. Skeat to be due to a French pronunciation of the English word *busk*. If the male Swan be invariably the bigger bird, it might be natural to suppose that he would be called "Cob" from his size. I imagine you are right about the "Pen" Swan's name. We must not forget Milton's expression, "They sum their pens." The desideratum is to discover the earliest documents in which the names "cob" and "pen" occur.—HERBERT A. STRONG (University College, Liverpool).

Origin of the terms "Cob" and "Pen."—I am inclined to take Dr. Murray's view (New Eng. Dict.) that the notions of *cob* are "something big, or stout"—"something forming a rounded lump," &c. He adds, "Thus *cob-nut* can hardly be separated from the notion of 'big nut' on the one hand, or from that of 'fruit stone' on the other." These ideas of sturdiness and roundness seem quite mixed up. It does seem very likely that "cob = round stone" is the primary idea; and then the notion of sturdiness, bigness, masculinity was easily superadded. I do not see how we can ever settle so intricate a tangle as this. Wedgwood mentions not only *cob-nut* and *cob-stone*, but *cob-coals*, i. e. "large" coals. Ray has *cobby*, stout, hearty, brisk. Lonsdale dialect, *cobby*, tyrannical, set up, proud: see *Cobby* in Murray. I think *cob* sufficiently conveys the notions of bigness, stoutness, hence "male," without any necessary reference to the *cob* on the bill: though of course that *might* be it. *Pen* I can make nothing of. There are two pens: (1) enclosure, sty; (2) feather. *Pen-swan* is entered under (2) in the 'Century Dictionary.' But they do not say why *pen-swan* comes under Pen (2) more than under Pen (1), and I find no evidence. It looks very much as if the origin of *cob-swan* is a little dubious, and that of *pen-swan* is unknown.—W. W. SKEAT (Cambridge).

Origin of the terms "Cob" and "Pen."—Surely your "Cob" and "Pen" are Welsh words—I write Celticè. But any Welsh dictionary gives *côb*, a tuft or bunch, and our English *cob-nut* is a round nut. This

exactly coincides with your interesting conclusion about the prominent and largely developed "knob" at the base of the bill in the male (p. 374). *Pen* is a common Welsh word also for "head," and is applied to birds thus: *Penddu* (pronounced *Penthe*)=the Blackcap; *Penaur*, the Yellowhammer; *Penwyn*, the bald Buzzard (*i. e.* Marsh Harrier). All this is from Dr. Richards' Welsh-English Dictionary, printed at Wrexham, and it seems to point strongly to Welsh favouritism for the female Swan as the head (*pen*) of the birds. You will perhaps say this is all *pen-gamrwydd*, which Dr. Richards delightfully renders "wryness of head"! Surely the Wryneck is humanized—a curious instance of the Welsh worship of birds. The Welsh for "Swan" is *Alarch*, plural *eilarch*, a word surely connected with *alon*, music, and the Whooper "fluting a wild carol ere his death." It may not be amiss to add that our word "eider" is the Welsh *ydry*, signifying "downy," and was applied to cygnets at least as early as 1553, as appears from an entry in Kirby's 'Annals of Winchester College,' p. 276.—H. D. GORDON (Harting Vicarage, Petersfield).

Origin of the terms "Cob" and "Pen."—*A propos* of your remarks on the derivation of the term "cob," as applied to the male Swan (p. 373), it may interest you to learn that the fishermen here in North Yorkshire make a common use of the word "cop" in referring to a bird's crest. I have occasionally been told that some of the men have seen "a Sawbill (*Merganser*) with a grand cop," and have heard of "a duck with long feathers in its tail and a white cop"=(Long-tailed Drake). Other examples might be cited, but these will suffice to illustrate my meaning. There are still many words in daily use in Cleveland which are almost pure Anglo-Saxon or Danish, no doubt transmitted from the original settlers on these shores, the descendants of whom are to be found in the North Riding.—T. H. NELSON (Sandringham House, Redcar).

Alleged abnormal Nesting of the Goldcrest in Ireland.—In all deference may I suggest that it is hardly correct to refer to the nesting-site of the Golden-crested Wren, *Regulus cristatus*, against the sides of ivy-covered trees as abnormal. Mr. A. T. Mitchell (p. 385) draws attention to the fact that in his experience such is the situation commonly selected in Ireland, in contradistinction, as he believes, to that appropriated for the purpose of nidification by the species in England. I am naturally in ignorance as to whether Mr. Mitchell is writing from personal knowledge of the nesting economy of the Goldcrest in the latter country, or whether his opinion is based on the writings of our standard authorities; but, in any case, I am presumptuous enough to think that silence on the point at issue on the part of those to whom we are accustomed to look for light and leading where the habits of birds are concerned arises from the fact that no small portion of the ornithological literature of these islands is attributable

to praiseworthy compilation rather than original observation. I have found nests of the Goldcrest placed against the sides of ivy-clad trees in some half-dozen instances during my nesting career in England, and my argument is that, if so many could be found by a single individual, there must be very many others which pass unobserved. The first nest I discovered so located was on the banks of the river Lugg, between Mortimer's Cross and Aymestrey, in Herefordshire. Another was by the side of the avenue leading to Place Castle, near to Fowey, in Cornwall. Yet another was in the gardens at Nosely Hall, in this county (Leicestershire). In my 'Original Sketches of British Birds'—a work on the eve of publication—I have made particular allusion to this not altogether unfamiliar situation for the Goldcrest's nest, though I have often marvelled at its being one which authors with common consent have apparently ignored.—H. S. DAVENPORT (Skeffington, Leicester).

Abnormal Nesting of the Goldcrest in Ireland.—In the last number of 'The Zoologist' (p. 385), Mr. A. T. Mitchell mentions that the Goldcrest, *Regulus cristatus*, commonly builds in ivy-covered trees. I think the following table, taken from my notes of seventeen nests of this species found in the county Dublin, may be of interest:—

No.	Year.	Tree or Shrub.	Position as regards Branch.	Height from Ground.
1	1883 (?)	Spruce fir	Beneath	13 ft.
2	1884 (?)	Silver fir	Above	11 "
3	1885	Ivy against ash	Do.	5 "
4	"	Gorse or whin	Do.	6 "
5	1889	Ivy against Scotch fir.....	Do.	30 "
6	1890	Ivy against ash	Do.	14 "
7	1891	Cypress	Beneath	18 "
8	"	Evergreen oak	Do.	12 "
9	"	Do.	Above	9 "
10	"	Do.	Do.	40 "
11	"	Do.	Do.	11 "
12	"	Silver fir	Do.	8 "
13	"	Do.	Do.	20 "
14	1892	Do.	Do.	15 "
15	1894	Thorn	Do.	7 "
16	"	Ivy against <i>Phyllyrea</i>	Beneath	6 "
17	"	Ivy against thorn	Above	10 "

These statistics tend to support Mr. Mitchell's observations.—J. TRUMBULL (Malahide).

Richardson's Skua at Hastings.—On Aug. 30th a very dark-coloured specimen of Richardson's Skua was shot at Rye, and brought to Bristow, the taxidermist, for preservation. A few days afterwards a very light-coloured one was picked up dead at Sidley, near Bexhill, with an old wound in the eye and the gizzard empty. Both were young birds.—G. W. BRADSHAW.

Roller in Northumberland.—On the morning of 24th Sept. last a good specimen of the Roller, *Coracias garrula*, was shot in the grounds of Callaly Castle, the ancient seat of the Claverings, about three miles S.W. of Whittingham station on the Alwick and Cornhill line. I happened to be in the house at the time, and so was able to examine the bird while still quite fresh. It was apparently a bird of the year, but a very good specimen. I believe about a dozen specimens of the Roller are recorded to have been met with in Northumberland during the present century. — H. B. TRISTRAM (Durham).

American Yellow-billed Cuckoo in Dorsetshire.—Noticing the communication under this heading (p. 376), it has struck me that the bird here mentioned is very probably identical with some which travelled for a week with me early in October. I left Boston, Mass., on the steamship 'Otto-man' on Oct. 1st, and when off Cape Race ten or fifteen birds came on board. There was plenty of hay on the deck, which afforded them shelter and perhaps food. Six or more of them were caught by the engineers, while three others were about the decks up to twenty hours of our making the Irish coast, at 8 a.m. on Oct. 10th. I should think the specimen alluded to might have been blown off a cattle steamer, such as ours was, bound for London. All depends on the identification of the species, and I will try and send you one of our captives to clear up the matter and settle its identity.—RALPH L. NEILSON (Fulwood Park, Liverpool).

[The specimen picked up dead in Dorsetshire, as mentioned p. 376, was found there on Oct. 5th.—ED.]

Honey Buzzard nesting in Herefordshire.—The interest in Mr. W. E. de Winton's note on this subject in the most recent issue of 'The Zoologist' will surely be grievously discounted in the estimation of ardent field-naturalists by the reflection that a most untoward fate has overtaken a beautiful and essentially harmless species. That both male and female should have perished is simply deplorable. It was only four or five years ago, when shooting at Bishopswood, that I stopped to examine a specimen of the Rough-legged Buzzard, *Buteo lagopus*, which had been killed and gibbeted in one of the woods, and was dangling to and fro in the breeze in company with other less distinguished tattered and decaying frames. As in the instance recorded by Mr. de Winton, the murder had been committed in ignorance of the species, which, so far as I recollect aright, was designated a Goshawk, *Astur palumbarius*. One had only to take a bird's-eye view of Bishopswood and its surroundings to realise that the district was naturally adapted for periodical visits on the part of the rarer *Raptores*, and I am quite sure that Mr. H. McCalmont, who is a personal friend of mine, and to whom I am writing on the subject, will issue stringent orders that Buzzards and Kites henceforward are not to be molested. The explanation that an undiscerning keeper had shot the Honey Buzzards at

Bishopswood in mistake for Kites, will scarcely mitigate what many will deplore, if only from long time association of a charming species with Selborne Hanger and Gilbert White.—H. S. DAVENPORT (Skeffington, Leicester).

Black-winged Stilt in Norfolk.—On Oct. 17th my son shot a very rare bird, the Black-winged Stilt, *Himantopus candidus*, on the common, about a quarter of a mile from this house. We identified it from the description in Mudie's 'British Birds,' with which it perfectly agrees, and, having ascertained its rarity, forwarded it to Mr. T. E. Gunn, of Norwich, for preservation.—THOMAS MOORE HUDSON (The Manor House, Castleacre.)

[The Black-winged Stilt is perhaps the rarest of all the European wading-birds which visit us in spring and autumn, never remaining here to breed. We have not heard of one for the past fifteen years, if we except a specimen reported (Zool. 1889, p. 387) to have been shot on the Trent near Nottingham, but subsequently shown (Zool. 1890, p. 25) to have been mounted from a foreign skin and fraudulently put forward as a British specimen by an unscrupulous dealer. One of the last recorded was a bird seen in the marshes between Eastbourne and Polegate by the late Capt. Clark-Kennedy on May 6th, 1880. In 1883 these were reported to have been seen near Rye on Sept. 3rd (Zool. 1883, p. 495), but the species was not satisfactorily identified. They may have been Avocets, or possibly Oystercatchers.—ED.]

Escape of a Caged Eagle.—Under this heading, in 'The Zoologist' for October (p. 380), the fact was announced that a Golden Eagle in the Zoological Gardens at Bristol had contrived by an accident to make its escape. We have since learnt from Mr. H. S. Devonport, of Skeffington, Leicester, that a bird of this species was shot on Oct. 29th in Slate Wood, on the estate of Sir Hugh Cholmeley, Bart., at Easton, and is in the hands of the taxidermist for preservation. This announcement was made in the 'Grantham Journal' of Nov. 9th, where the bird is described as measuring 2 ft. 11 in. in length and 7 ft. 2 in. from tip to tip of wing. General colour a deep brown, mixed with tawny on the head and neck; quills chocolate with white shafts; tail black spotted with ash; legs yellow, feathered down to the toes; bill of a deep blue. Sex male; weight 7 lbs. From the description given by Mr. Devonport of its being seen at Skeffington between Oct. 24th and 28th, when on several occasions it suffered a near approach without showing undue alarm, there can be little doubt that this was the bird which had made its escape three weeks previously.

INSECTS.

Insect Migration.—*A propos* of this subject, discussed in the last two numbers of this Journal, Mr. E. L. Mitford directs attention to the following information, which is given by Miss Gordon Cumming in her entertaining book of travels entitled 'Two Happy Years in Ceylon' (2 vols.

8vo, Blackwood, 1892). At p. 208 of the first volume this writer observes:—“The butterflies of Ceylon are so beautiful and so varied as to be at all times a joy, whether seen singly, when one glorious creature seems for a moment to have the garden to himself, or in companies of radiant joyous little beings. One of the mysteries of the isle is the annual migration in November and December, and at intervals right on to February, of countless myriads of butterflies in vast flights; whence they come and whither going, no one can guess. The migration commences with the setting in of the north-east monsoon, with its cool mornings and bright days; and when the stormy wind blows strongest, these delicate insects, impelled by some inexplicable instinct, force their way against it, and during a couple of months successive legions pass on like an ever-flowing stream. I have collected a few notes of observations made on this subject in different years. Thus, in 1884, swarms of dark-coloured butterflies passed over Kandy and Ratnapura on Nov. 19th. On the following day these were succeeded by swarms of white and yellow ones. In 1887 Mr. Le Mesurier, writing from Nuwara Eliya, noted the first flight of the season on Nov. 18th. The flight lasted the whole day; direction from due south-west to north. Wind from south-west. Colour of butterflies speckled dark brown. The next flight he noticed was on Nov. 21st, when two kinds of butterflies, white and sulphur, continued all day passing right over the summit of Pedro from north to due south. The direction of the wind was from the north-east. On Dec. 10th another observer stated that brown and white butterflies had been in flight for some days, flying south. In 1888 the migration northward in the teeth of the wind was observed at Colombo on Nov. 18th, the great flight of white and yellow butterflies being mingled with some of a darker colour. In 1889 flights were observed in the mountain district of Dimbula, about the middle of October, and at Colombo on Nov. 5th, when dark brown butterflies and yellowish-white ones flew *in separate columns* at a rate of about ten miles an hour. All the accounts (which might be multiplied by observations from all parts of the island, north, south, east, and west, from Manaar to Galle, and from Trincomalee to Negombo) speak only of brown, white, and yellow insects; hence I infer that the glorious butterflies which most delighted us do not risk becoming food for fishes by any such venturesome flights.”

Insect Migration.—I notice a correspondent mentions the abundance of *Sphinx convolvuli* on the east coast as being the probable result of migration on the part of this insect. It may be of interest, although scarcely bearing out your correspondent's theory, to note that *Sphinx convolvuli* appears to have been equally plentiful on the west coast of Wales. While staying at Barmouth, during September last, I saw nine of these fine insects caught during two or three nights (five on one night, if I recollect rightly), while hovering over a small patch of tobacco-plants in

front of the house. Two more, at least, were brought into the house by the cat, and probably many more met their fate by the same means. Had the insects been searched for, there is no doubt that a very much larger number might have been secured. Their appearance and condition (excepting those captured by the feline entomologist) was fairly good, and certainly did not look as if they had borne the wear and tear of a sea as well as a land journey. On the other hand, I am not aware that that part of Wales is a recognised locality for this somewhat scarce moth.—S. PRIOR (25, Aldebert Terrace, Albert Square, S.W.).

REPTILIA.

Adders swallowing their Young.—I consider there can be no further testimony needed to substantiate the long-contested question whether the Adder swallows her young in time of danger than that of Charles Joyce, of Winterbourne Houghton, Dorset. An Adder was seen by Joyce to lower her head, which had been for some time in an erect position, and after resting the lower jaw on the ground, she deliberately opened her mouth, and received her offspring, thirteen in number. With thoughtful precaution, after killing her, he tied a string round her throat, and brought the reptile home, a considerable distance from the wood where it was killed, and in the presence of my tenant he liberated the thirteen young from the dead body of the old one, as lively as when they entered her mouth some hours previously—a distinct proof that they had not entered the actual stomach, otherwise digestion would surely have commenced its disintegrating work.—J. C. MANSEL-PLYDELL (Whatcombe, Dorset).

FISHES.

Ray's Sea Bream at Scarborough.—On Oct. 19th, hearing that two fisher lads were trying to sell a strange fish, I went in quest of it, but arrived only in time to find it sold. It proved to be a remarkably fine specimen of Ray's Sea Bream, *Brama raii*, measuring 24 inches in length, and weighing $7\frac{1}{2}$ lbs. It had evidently just been brought in by one of the fishing-boats, for it was scarcely dead when I first saw it. It was eventually purchased by Mr. J. W. Woodall, of Scarborough, and forwarded to the Natural History Museum, South Kensington. In Buckland's 'Natural History of British Fishes,' a specimen weighing $4\frac{1}{2}$ lbs. is mentioned as being of unusual size: this was nearly double that weight.—WILLIAM J. CLARKE (44, Huntriss Row, Scarborough).

MOLLUSCA.

The Shell Slug in Scotland.—Mr. William Evans, of Edinburgh, writes to me in reference to a specimen of *Testacella haliotidea* which I recorded from this district as the first one captured in Scotland, that another was found some time ago in Sang's nursery in Kirkcaldy.—ROBERT SERVICE (Maxwelltown, Dumfries).

NOTICES OF NEW BOOKS.

The Natural History of Aquatic Insects. By Professor L. C. MIALL, F.R.S. With Illustrations by A. R. HAMMOND, F.L.S. 8vo, pp. 395. London: Macmillan & Co. 1895.

A POPULAR interest in Natural History founded upon observation is one of the latest fruits of the revival of learning. During the course of the eighteenth century, the discoveries of Swammerdam and Réaumur slowly made their way into the thoughts of the people, and some acquaintance with the life-history of Insects is now to be counted upon in every reader. The death-like repose of the chrysalis and the emergence of the butterfly, the short life of the winged Ephemera, and the transformation of the Dragon-fly from a sluggish larva lurking in pools to a glorious winged creature flying swiftly through the air, are now among the every-day illustrations of the preacher and moralist, and form a highly characteristic feature of modern literature.

To revive an interest in the writings of certain old-time zoologists—Swammerdam, Réaumur, Lyonnet, and De Geer—whose teaching has been unduly neglected, and to carry on as well as to popularise their work, is the chief object of Prof. Miall's book, and we heartily welcome it as an efficient and instructive guide to those young naturalists who take a delight in observing the structure and habits of living animals.

It was a good idea of Prof. Miall's to begin by telling us what was known of aquatic insects up to a certain point through the teachings of our predecessors above named, explaining their shortcomings and mistakes as viewed by the light of modern research, and then to carry their observations further by completing the life-histories which they had commenced, but had left unfinished. Prof. Miall, in point of fact, has saved the reader a considerable amount of trouble. He has gone through these old volumes, picked out whatever was worth noting, added his own comments in editorial brackets, and brought the information up to date. But he has gone further than this. He has given us the outcome of his own researches, and those of certain fellow-workers, into the *structure* of aquatic insects as correlated with

habit, and the result is a most useful guide to the subject of which it treats, the value of which is enhanced by the original illustrations so carefully drawn by Mr. A. R. Hammond. In these days of rapid production of books, it is refreshing to take up a volume which contains new figures expressly designed for it—figures moreover which really serve their purpose by illustrating the author's meaning, instead of vexing the reader (as so often happens) by not showing the very points on which some elucidation is needed.

The aquatic insects described in this volume have been selected on no philosophical principles. They are merely such as the author has happened to come across in his rambles by pond and stream, or along the coast. But even this chance collection of aquatic species yields interesting results when studied from the right point of view. Prof. Miall describes them in the following order:—Coleoptera, Diptera, Hymenoptera (Ichneumons), Lepidoptera (Moths), Trichoptera (Caddis-flies), Sialidæ (Alder-flies), Perlidæ (Stone-flies), Ephemeridæ (May-flies), Odonata (Dragon-flies), Rhynchota (Water Scorpions), and Thysanura (Springtails).

Especially interesting are his remarks on the "Degrees of Adaptation to Aquatic Conditions," and on the "Wintering of Aquatic Insects" (Introduction, pp. 11, 18). On the latter point the author says:—

"The common rule is, I think, that aquatic insects winter as larvæ. Nearly all aquatic Diptera, Dragon-flies, May-flies, Stone-flies, and Caddis-flies do this. Occasionally, however, the winged individuals hibernate. Examples are furnished by the Gnat, and one of the Dragon-flies (*Lestes*). Fully armoured species, such as beetles and bugs, commonly pass the winter in the winged state, burying themselves in the mud or in the earth during unusually severe weather. Aquatic insects which have wintered as larvæ usually undergo transformation, and lay their eggs in the following spring. From these eggs a summer generation proceeds, which becomes ready for egg-laying in September, and so the cycle comes round."

In order to study the movements of a Caddis-worm (*Phryganea grandis*) under something like normal conditions, Prof. Miall suggested to a friend, Mr. T. H. Taylor, to supply a naked living specimen with small plates of *mica*, in the hope that a transparent case might be formed. This expectation was fully realised. The creature formed a shapely and sufficiently transparent case

of *mica*, and permitted Mr. Taylor to make some curious observations, of which a summary is given (p. 248). But the entire chapter on Caddis-worms (Chap. V.) is full of interesting details.

Hardly less instructive is the chapter on "Insects of the Seashore" (pp. 370-381). When examining, after a day's shore-shooting, the contents of the stomachs of various plovers and sandpipers, which seek their living chiefly between high and low water-mark, we have been at times surprised to notice the quantity and variety of insect life which these birds contrive to pick up on the sea margin, though often so comminuted by the action of the gizzard, as to render identification difficult, and often impossible, the most conspicuous fragments being portions of the hard, horny wing-cases of small beetles. We should have supposed that immersion in salt water would not only have killed these insects, but have rendered them so unpalatable and innutritious as to cause them to be rejected by the birds. But this does not appear to be the case. Prof. Miall says:—

"The saltness of sea-water might be expected to prove disagreeable, if not injurious, to insects, but there is little proof that such is actually the case. Insects, when forcibly submerged, survive about as long in salt water as in fresh. Many are not easily wetted by water. The hairs with which some are covered, and the dense, glossy chitin of others, prevent effectual wetting. The surface film of water will not pass into small openings such as the mouth, or the spiracles, or the spaces between close-set hairs. . . . Packard dredged up live *Chironomus* larvæ in Salem harbour, and not a few dipterous larvæ have been found established in brine-vats. Plateau has drawn up a list of nearly *eighty* species of insects and Arachnidæ which, though they cannot swim, and breathe only gaseous air, inhabit the sea-shore and undergo daily, or at least frequent, immersion."

Some idea of the abundance of insect food which wading-birds find along the shore may be gathered from the remarks which follow. Prof. Miall mentions a number of dipterous and coleopterous species which are found between high and low water-mark, and describes their habits and transformations in a way calculated to awaken the highest curiosity in the reader to make their acquaintance. With such a chapter as this to guide him, no observant naturalist need spend a dull day at the seaside. The concluding chapter in the book deals with what are termed "The Contrivances of Aquatic Insects"—modes of locomotion, methods of capturing food, respiration, and so forth. Attack and

defence call forth yet more contrivances. Protective resemblance, concealment within burrows, by webs, by portable cases, by fixed cases, by the transparency of the body, are a few of the arts practised by aquatic insects, either in self-defence, or as a means of pouncing unseen upon their prey.

“The egg-laying of aquatic insects is attended with special difficulties, some of which spring from the fact that the female fly is in general ill-fitted to enter the element in which the earlier stages have to be passed. These fresh difficulties are met by fresh contrivances. The egg-ropes of *Chironomus*, the egg-raft of the Gnat, the anchoring threads of the eggs of *Ephemera*, the floating cocoon of *Hydrophilus*, are adaptations of peculiar interest, *Dytiscus*, *Notonecta*, *Ranatra*, and certain Dragon-flies, lay their eggs in incisions made in submerged plants. But even these carefully hidden eggs are searched out by such egg-destroyers as *Polynema*, which lay in them their own eggs, from which proceed the parasites which will, in the end, devour their undeveloped host.”

One might go on to enumerate fresh contrivances under such heads as the constructions of aquatic insects, the emergence of the winged fly, the defences of resting pupæ, and so on; but the subject is inexhaustible, and it must suffice to refer the curious reader to the book itself from which we have culled these few details. We must, however, make one more extract, and this time from the Introduction. At page 24 Prof. Miall concisely remarks:—

“Aquatic insects make a capital study. While you are looking for one kind, you will come across another. The same methods and the same tackle will do for all. If a young student wants to observe the ways of living creatures, we may recommend aquatic insects to him as an accessible and very imperfectly explored field. He will find plenty of undescribed forms and plenty of beautiful contrivances which no one has ever taken the trouble to observe. But to make out the way in which the exquisite machinery of nature is meant to work is no childish pursuit. The very attempt will lead the naturalist to acquaint himself with scientific laws which seem altogether foreign to Natural History; it will exercise his industry and sagacity; it will extend his knowledge of the possibilities of life.”

With these very pertinent remarks we cordially agree.

THE ZOOLOGIST

No. 228.—December, 1895.

THE SPEED OF HOMING PIGEONS.

FROM the correspondence which has appeared in the last two numbers of 'The Zoologist,' it will be seen that the statements of Herr Gätke, in his work on Heligoland, respecting the rate of speed in migratory birds, have awakened considerable interest amongst ornithologists. We have already given reasons for dissenting from certain of Herr Gätke's estimates, believing them in some cases to be exaggerated, and in others to be unsupported by evidence. The species to whose estimated rate of speed we particularly took exception (p. 378) were the Hooded Crow, the Bluethroat, and the American Golden Plover.

In view of Sir George Cayley's precise calculation that a Rook usually flies at the rate of about 35 feet per second, or 24 miles per hour,* it is impossible to accept Herr Gätke's statement that the speed of the Hooded Crow (so nearly related as it is to the Rook in size, structure, and form of wing) can be 108 miles per hour, or more than four times as great.

Equally impossible is it to accept, as Herr Gätke's does, the statement (*op. cit.* p. 64) made fifty years ago, which credits a pigeon with a speed of 100 geographical miles per hour; for it has been well ascertained in recent years, by careful experiment, that the rate at which a Homing Pigeon flies

* "Aerial Navigation," in 'Nicholson's Journ. Nat. Phil.,' xxiv. p. 164, quoted by Prof. Newton, 'Dictionary of Birds,' art. "Flight."

does not amount to half that speed, and rarely exceeds 36 miles per hour.*

In connection with this subject, we would direct attention to some statistics furnished by Capt. C. T. Keene to the 'Homing News,' and published in the issue of that journal for March 23rd, 1894; and also to some remarks by M. Felix Rodenbach, in his work on Experimental and Scientific Colombophilism.

Capt. Keene writes:—"In his work on Natural Inheritance, Mr. Galton explains a graphical method of 'showing how to

TABLE I.

VELOCITY YARDS PER MINUTE.

3207 old birds flying over 90 miles (average 141 miles).

Velocity. Yds. per min.	No. of cases observed.	PERCENTAGES.	
		No. of cases observed.	Sums from the beginning.
Under 500	22	·6	·6
" 600	43	1·3	1·9
" 700	164	5·3	7·2
" 800	284	8·8	16·
" 900	598	18·6	34·6
" 1000	645	20·3	54·9
" 1100	683	21·3	76·2
" 1200	396	12·3	85·5
" 1300	132	4·3	92·8
" 1400	120	3·6	96·4
Over 1400	120	3·6	100
Total	3207	100	

TABLE II.

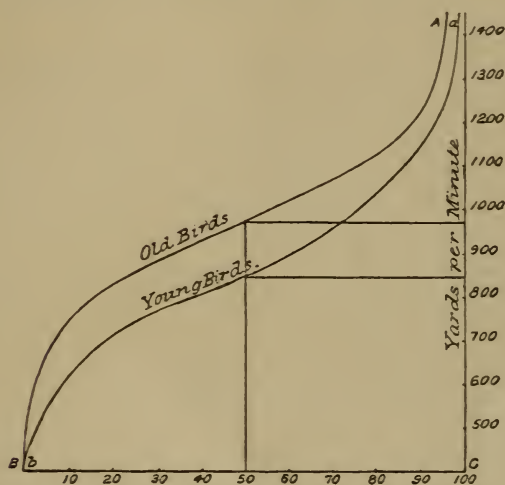
2914 young birds flying in races between 50 and 100 miles.

Under 500	107	3·6	3·6
" 600	154	5·3	8·9
" 700	297	10·1	19·0
" 800	543	18·6	37·6
" 900	684	23·4	61·0
" 1000	415	14·2	75·2
" 1100	284	9·3	84·5
" 1200	238	9·1	93·6
" 1300	114	3·8	97·4
" 1400	49	1·6	99
Over 1400	29	1	100
Total	2914	100	

determine the grade of an individual among his fellows in respect to any particular faculty.' I have thought it might interest

* Tegetmeier, 'The Field,' Jan. 22nd, 1887, p. 114.

pigeon-flyers if by the same method I constructed a diagram by which the individual grade or figure of merit of a homing pigeon could be ascertained in respect to its flying velocity, not only among birds of its own loft, but also among the bulk of the pigeons of other lofts. Two tables, and a diagram made from them, are accordingly given. The former show how the latter was arrived at. Table I. refers to old birds, and by means of it the upper curve A B is drawn. Table II. refers to young birds and from it the lower curve *a b* is made. By the aid of the diagram then we are able to compare—(1). Any individual old bird whose mean flying velocity for an average distance (about 141 miles) is



known, with old birds in one's own loft, or with nearly all old birds, which flew last year to other English lofts. (2). Any young bird of last year in the same manner. (3). We can compare old birds with young. For example—We have an old bird which has made a mean velocity of 970 yards per minute. From the point 970 on the perpendicular A C we carry a line horizontally till it meets the upper curve A B. From this point of intersection we drop a perpendicular to meet B C, and we find it meets it at the grade 50. In other words, as compared with all other old birds, our individual pigeon is of mediocre rank; 50 per cent. made higher velocities 50 per cent. lower. Again, we possess a young bird with a recorded mean average velocity of 850 yards per minute. A horizontal from this point to the lower curve *a b*, and a perpendicular dropped as

before, gives to the young bird also mediocre rank, *i. e.* 50 per cent. of other young birds were faster. And to compare old birds with young, we can readily see that the average old bird makes a velocity of 120 yards more per minute than the average young bird.

“ These curves of distribution, as they are called, vary little from year to year. That is to say, curves made from the records of the next racing season will practically be the same as those here given. In process of years we shall undoubtedly see a difference. The average old bird, say in ten years' time, will make a higher mean velocity than 970 yards, presuming, of course, that we breed only or in most part from the fastest birds of the present time.”

One of the most interesting chapters in M. Rodenbach's work above referred to—an English translation of which appeared in parts in the 'Homing News'—relates to the speed of homing Pigeons, and from this contribution to our knowledge on the subject we make the following extract:—“ As we all know, the mean or average speed of the Pigeon is calculated at about thirty-eight miles per hour. It happens constantly, however, that the wind is blowing a tempest, or that the birds have to struggle with thick fog or adverse wind. Under the first-named of these sets of conditions, our birds may attain a giddy and almost incredible speed; under the other, their speed is lowered to almost any degree, and they are seen to fly so low as well nigh to graze the roofs over which they move along. In the first case, all is surprise, and verifiers have scarcely time to settle at their posts before the champions are tumbling in upon them pell-mell. In the other case, the fancier quivers with impatience, and yawns out his vexation to the passing rooks above him, sometimes for the whole day together. According to the interesting notes accumulated by M. Rodenbach, the highest speed attained under favourable conditions was 2150 yards a minute. The birds had a tail wind, and the distance flown was no more than sixty miles. In 1868, a Pigeon belonging to M. Delmotte, of Brussels, obtained the first prize from Orleans with a speed of 2175 yards per minute, but in this instance the wind blew a perfect gale from the south-west. If these races had not been organized by responsible clubs, we should have reason for suspecting some error to have been committed in the published statement of the

hour of toss, for no one will fail to see that if Pigeons be tossed a full hour prior to the time stated, and according to which the race is governed, the rate of speed as then calculated is an exaggerated one.

“From observations extending over forty years, M. Rodenbach has arrived at 2150 yards as the maximum speed under a strong but not a violent wind. In comparing the speed of the Pigeon with that of our ordinary express trains, it has repeatedly been shown, by actual toss from the train itself, that, as soon as it had attained to its full speed, the Pigeon had decidedly the advantage.* It remains only to reckon with the balloon, which at a great elevation, does its sixty miles in the hour. In rainy and foggy weather we have to greatly tone down our estimate of the Pigeon’s speed. This is then often transformed into extraordinary slowness. Whilst in calm, bright weather our bird attains to a height which reduces it to a speck in our eyes, it now flies low, heavily and hap-hazard, accomplishing only, at the expense of great exertion, a mere five or six hundred yards per minute. In short tosses, the mean speed of the Pigeon, with fair weather and favourable wind, is from 1350 to 1550 yards per minute. When in any great national toss the birds return with upwards of 1100 yards a minute to their credit, the initial speed must have been very considerable; it may be fairly estimated that the first 250 miles were done at the rate of 1350 yards per minute, and the remainder at 850, which gives us the average of 1100 yards per minute. The rate of speed therefore diminishes in proportion to the length of flight. But, in point of fact, nothing can be accurately known as to the real speed of our bird, for when calculating we take a straight line from the point of toss to that of return. A very little consideration, however, will suffice to show that the line thus drawn by us by no means represents the distance actually flown. The Pigeon describes innumerable curves when tracking its way through immensity. The winds are masters of the road there, and have to be reckoned with by the valiant and faithful creature. To-day you will see it returning by the south, to-morrow by the north, the next day by the west.

* The reverse of this is the case with the Partridge. See W. Burgess, ‘The Field,’ 27th Nov., 1886, and Prof. Newton, ‘Dictionary of Birds,’ 1893 p. 566.—ED.

The actual speed of the Pigeon is bound to be vastly greater than is attributed to it. Naturally we can only reckon the distance flown, as above stated, by striking a line from the point of toss to that of return; this, indeed, is our only basis of calculation; but we are always below, and must ever and always be below, the real distance flown: the only question is—how much below?"

NOTES AND QUERIES.

Memoir of the late A. G. More.—Many friends of the late Mr. A. G. More having expressed a wish for the publication of a more extended memoir of him than has yet appeared, those who possess any letters or other papers of importance from him, would greatly oblige by forwarding them, on loan, to his sister, Miss MORE, 74, Leinster Road, Rathmines, Dublin.

MAMMALIA.

The Long-tailed Field Mouse of the Outer Hebrides.—I regret to observe, by Mr. Steele Elliott's communication (p. 426), that in my article in the previous number (p. 369), I overlooked his remarks printed in the 'Journal of the Birmingham Natural History Society,' a periodical which, I need hardly say, I have never had an opportunity of seeing. Now that he has kindly acquainted us with the description which he there gives of the mouse obtained by him in St. Kilda, it appears to me that the animal described by him may possibly still be distinct from that which formed the subject of my article. Mr. Elliott states that the St. Kilda mouse "differs from our ordinary form by the adult having the fur on the back greyish brown, similar to the young of our Long-tailed Field Mouse, instead of reddish brown as in our adult type, and on the belly the fur has a lovely pink shade instead of pure white." Now if this description be compared with that of *Mus hebridensis*, it will be seen that I said nothing about the fur of the back being greyer, nor have I ever seen a mouse with fur of "a lovely pink shade" on the belly. But as this description was admittedly taken from a single specimen, I think it highly probable that it was an individual variation. My description was based on about twenty specimens of all ages and of both sexes, and I find this mouse goes through all the usual colour-changes of the group; in some cases those still in the grey pelage, with unworn teeth, being found with young. I have six embryos in spirit, taken from a young female hardly more than half grown, and in dark grey coat; and I may say that this is the largest number I have ever found in any mouse of this group, of any age. My article was written just a year ago, not being altered except in the preliminary paragraph, and was

written originally for the 'Annals of Scottish Natural History,' but was not sent in, for the reason I gave, that I hoped to revisit the islands; but a note recording the "Long-tailed Field Mouse in the Outer Hebrides" was inserted in the January number of that Journal instead. In this notice I mentioned St. Kilda as a locality in which this mouse occurs, and I wrote this from seeing a specimen at the British Museum, which I understood had been obtained by the minister of that island; but as I was informed that no others had been received, and as this single specimen was in spirit, and useless so far as measurements were concerned, I did not think it worth mentioning in my article. For comparison I have looked at something like 300 skins, a great number of which were collected and preserved by myself and measurements taken in the flesh, from nearly every county in the British Islands, and I find that those received from Ross, Cromarty, Skye, and all also parts of Ireland, are perfectly typical *Mus sylvaticus*. I have not yet received any specimens from Orkney, but there seemed no reason to wait for these, as it could not possibly affect my description. As to the Inner Hebrides, they are merely part of Scotland, and the fauna is not likely to differ from that of the mainland.—W. E. DE WINTON.

Harvest Mouse in Shropshire.—In your interesting article on the Harvest Mouse (pp. 418—425) I note that you do not include Shropshire amongst the counties in which it has been found. In 1872, when on a visit to the late Mr. W. Hyslop, in the village of Church Stretton, twelve or fifteen miles from Shrewsbury, one of the children brought in a Harvest Mouse. I enquired where she had found it, and went to the place in search of others. It was a low, flat bit of marshy land (afterwards reclaimed), through which ran an open, sluggish streamlet, and on the margin of which grew rushes. A portion of the upper end of the field skirting the road to Little Stretton was cultivated, and growing oats. After much search I found the remains of three nests, empty, and one with only two young ones in it, full grown and lively. That would be in August, or early in September, for the oats were ripe. I was informed that these mice were "quite common" there. It was in the same neighbourhood, high up on the Long Mynd Mountain, that I once encountered an Otter, one very clear moonlight night, twelve miles from any stream. There had been a long spell of dry weather, if I mistake not. I have seen Harvest Mice in Ayrshire, in the Mauchline district, forty years ago, where they were then common.—G. W. MURDOCH (Milnthorpe, Westmorland).

Provincial Names of Animals.—In Earwaker's 'East Cheshire' several extracts are given from the accounts of the wardens of the parish church at Wilmslow, and, among other entries, are records of two disbursements for "Maupe" heads, sixpence being paid for six heads in 1666, and sixpence for sixteen heads in 1669. The author suggests that Moles were referred to, but if that animal had been intended, it is more probable that "Moudywarp," a name still in use among the country people in Cheshire,

would have been the word used, although "Mold" occurs in the Stockport churchwardens' accounts for 1700, when a penny was paid for two of these animals. Can any reader of 'The Zoologist' throw light upon the subject, and state what a "Maupe" really is?—CHARLES OLDHAM (Romiley).

BIRDS.

Nesting of the Goldcrest.—I am surprised that Mr. H. S. Davenport considers that "authors with common consent have apparently ignored" the fact that *Regulus cristatus* nests against the side of a tree. In such a familiar text-book as the fourth edition of Yarrell's 'Birds' we are told that such a situation is occasionally adopted, and that the late Mr. Hewitson had seen a Goldcrest's nest in the middle of a juniper-bush. In the neighbourhood of Carlisle the Goldcrest nests both against the sides of trees, and in the centre of furze-bushes. On the 13th of May last, a young friend of mine brought me a Goldcrest's nest, which was carefully concealed in the heart of a furze-bush; and several others have been found in furze-bushes on the same common. The fact has long been known to the Carlisle field-naturalists, and is not a new departure from the usual habits of this *Regulus*. At Orton, near Carlisle, where the Goldcrests generally nest in furze, there is plenty of coniferous timber, so that it is from choice rather than from necessity that the Goldcrests there nest in furze. I imagined for years that the Goldcrest nested under fir-branches only, because I never happened in those days to come across nests in any other situation; but the latest records only amplify Professor Newton's remarks in the fourth edition of Yarrell, and cannot fairly be regarded in the nature of a discovery.—H. A. MACPHERSON (Carlisle).

Nesting of the Goldcrest.—In this neighbourhood I have found Goldcrests' nests more often among the hanging slender branches of ivy covering small stunted trees or thorns, and in larch and fir-woods than anywhere else, the average height from the ground being ten feet.—RICHARD M. BARRINGTON (Fassaroe, Bray, Co. Wicklow).

Quail in Surrey.—The occurrence of the Quail in Surrey, at any time unusual, is still more remarkable during the month of October. On Oct. 1st one was shot in a field of turnips near Ashstead by a member of a party walking up Partridges; it was in very fair condition, and was eaten. On Oct. 8th, while shooting near Headley, another Quail was observed by several people, including myself. It was running through some tall but thin mustard, two or three yards in front of the beaters. It ran into a thick broad hedgerow, and I saw it again on two or three occasions; it would not take wing, however, though I do not think it was wounded. Apart from the rarity of the occurrence, the late date at which it was noted is, I suppose, due to the splendid warm weather which prevailed at the end of September.—J. A. BUCKNILL (Epsom).

Breeding of the Goldeneye in the Washburn Valley.—A pair of Goldeneyes, *Clangula glaucion*, bred last summer in a plantation on the margin of Fewston Reservoir, near Otley, Yorkshire. The young ones, four in number, were seen repeatedly in the vicinity of the nesting-place. After careful investigation, I detected the female was a wounded bird, unable to fly. This in all probability is the cause of their breeding here. A pair of Goldeneyes bred under similar circumstances during the summer of 1891, in a plantation on the margin of Swinsty Reservoir. One of the young ones was caught by my spaniel dog. The old male bird was shot, and is now in the collection of the Leeds Naturalist Club. The Goldeneye is a regular winter visitant here in limited numbers. The area of the two Reservoirs is 356 acres.—WM. STOREY (Fewston Lodge, Fewston, near Otley).

Broad-billed Sandpiper in Sussex.—On Oct. 2nd a female Broad-billed Sandpiper, *Limicola platyrhyncha*, was shot near Rye Harbour, Sussex, out of a small flock of Dunlins, *Tringa alpina*. It was a female bird of the year, and is now in the collection of Mr. Alexander, of Cranbrook. It is, I believe, the third specimen which has been obtained in Sussex. Mr. Burton shot one in the same neighbourhood on Aug. 13th, 1887, which is now in Lord Lilford's collection. Previous to this, namely, in October, 1845, Mr. Borrer purchased one in the flesh which had just been shot near Shoreham ('Birds of Sussex,' p. 227).—G. W. BRADSHAW (Hastings).

Red-necked Phalarope near St. Leonards.—Mr. Knight, of St. Leonards, shot a male Red-necked Phalarope, *Phalaropus hyperboreus*, on Oct. 17th, at a small pool of water on the Salts, Bulverhythe, near St. Leonards. It weighed 1 oz.; contents of gizzard, flies. Mr. Borrer, in his 'Birds of Sussex' (p. 218), notices five previous occurrences of this bird in the county.—G. W. BRADSHAW (Hastings).

Swallows returning to their Old Nests.—On June 6th, 1893, I caught with a fishing-net a pair of House Martins, *H. urbica*, which had built their nest under the eaves of our house. I put a small split-ring on the leg of each bird. The following year, June 20th, the birds returned with the rings still on their legs. A pair of Martins again nested here during the present summer in the same place; but unfortunately the male bird was killed by flying against a telephone-wire. When picked up it still had my ring on its leg. I was unable to prove the female to be also a marked bird, for she deserted the nest soon after the male bird was killed.—WM. STOREY (Fewston Lodge, Fewston, near Otley).

[This is not the first time that the experiment has been made of marking birds with a view to ascertain whether they return to spots where they have previously reared their young, and in the case of both Swallows and Swifts it has been proved that they do. For reported cases of the

kind, see 'The Field,' Sept. 30th, 1876; June 4th, 1881; and July 1st, 1893.—ED.]

Grey Shrike and Pomatorhine Skua in Norfolk.—On Oct. 3rd and 4th I was fortunate in shooting specimens of these birds on the north coast of Norfolk. The Shrike was an adult male, barred with white on the primaries, the inner primaries and secondaries tipped with white. The Skua was a young male in the intermediate plumage between the adult and bird of the year. The two central tail-feathers projecting only two inches, and with a dark band two inches wide across the upper part of the breast.—A. D. SAPSWORTH (Woodford Green, Essex).

Spoonbill in Norfolk.—On Oct. 5th and 6th a Spoonbill visited the marshes and mud-flats in the same district. It was an adult bird, for the pale yellow crest was visible with the aid of glasses, but its extreme wariness would not allow of a nearer approach than 100 yards.—A. D. SAPSWORTH (Woodford Green, Essex).

Kestrel taking Young Pheasants.—That the Kestrel prefers fur to feather is now recognised by all but the most obdurate of gamekeepers, although the reproach that the bird *will* take young game cannot be altogether wiped out. At the time of the hatching of the Pheasants during the late breeding season a female Kestrel was given to me which had fallen a victim to its repeated raids on a young brood. On dissection the justice of the charge was made abundantly clear, and indeed the bird was shot in the act of carrying off one of the brood. I was informed at the time that had it not been shot it would have cleared out the whole brood, although the truth of this information appeared to rest on opinion rather than experience. It is known that Kestrels do "often contract the bad habit of infesting the coops and carrying off the young birds," but Professor Newton says that this evil may easily be stopped, and that "the Kestrel is in the first place attracted to the spot by the presence of the mice which come to eat the Pheasants' food" (Yarrell, Br. B., ed. 4, i. p. 79). A comparison of Mr. Borrer's account of the Kestrel ('Birds of Sussex,' pp. 12, 13) with that of the late Mr. Knox's ('Ornithological Rambles in Sussex,' ed. 1, pp. 51—63) indicates a decrease of the species in Sussex of late years, which the former partly accounts for in the fact of there being fewer opportunities of appropriating the deserted nests of Crows and Pies, since these birds also have decreased.—W. C. J. RUSKIN BUTTERFIELD (St. Leonards-on-Sea).

Alleged former Nesting of Golden Eagle and Goshawk in England.—Dr. John Hill, the author of several zoological and geological works, whose 'History of Animals' was published in 1752, gives in vol. iii. of that folio an account of a supposed nest of the Golden Eagle in the south of England 150 years ago, which had the unusual complement of four eggs.

After remarking that he had shot one in Charleton Forest in Sussex, he adds that he had "once found a nest there, built in a strange, wild manner, and with four eggs in it." This statement need not be too hastily discredited, for his description of the Golden Eagle—"the size of a turkey with legs feathered down to the toes"—is detailed, and does not appear applicable to any other raptorial species; indeed it may have been taken, and very likely was, from the one he shot, though the number of eggs in the nest is certainly rather indicative of a Buzzard. Further on he mentions a Goshawk's nest in Rockingham Forest, in Northamptonshire, remarking that these birds are very bold, and that a servant who climbed the tree, probably to take the young, was attacked with the utmost fury by both the parents, and wounded in the face. There is nothing improbable in the supposition that this nest was that of a Goshawk, and Dr. Hill's statement that this bird "breeds with us in woods," may be applied to England as well as Scotland, where in the early part of the eighteenth century it was probably common. Other birds of prey also come in for a share of his attention, and his remarks will repay reading, for the worthy doctor has many notes of interest scattered throughout his bulky volume. In Lincolnshire he met with large flocks of Cranes, and in the same forest where he found the supposed Golden Eagle's nest he saw a Roller, and on the downs of Sussex great numbers of Bustards. He also killed four Black Grouse "on Hindhead, a vast mountainous heath on the Portsmouth road," and his account of the Bittern is evidently from personal observation, at a time when, as he says, they were "very common in our fen countries."—J. H. GURNEY (Keswick Hall, Norwich).

Black Tern in Wales.—In 'The Zoologist' for October last (p. 381) Mr. Mainwaring has recorded the occurrence of the Black Tern in North Wales, and remarks on its rarity in the Principality. It has also occurred on Llangorse Lake, Breconshire. It is stated in the 'Transactions' of the Woolhope Naturalists' Field Club, 1890-92, that two specimens of this bird were shot there in 1889, and were preserved. The Common Tern is often to be seen on that lake, and the Lesser Tern occasionally; but I believe this is the only instance on record of the occurrence of the Black Tern on this sheet of water.—E. A. SWAINSON (Woodlands, Brecon).

Supposed Breeding of the Crested Lark in Kent.—Among the oological discoveries this year none is perhaps likely to evoke more interest than the egg of the Crested Lark (*Alauda cristata*), taken in Romney Marsh on June 7th, and subsequently purchased by me at Stevens's Auction Rooms. The recorded evidence of the breeding of this bird in England having hitherto been confined to one alleged instance, at Ibiston, near Cambridge, in 1881 (Zool. 1883, p. 178), ornithologists will doubtless be glad to hear of a well-authenticated case, the parent birds having been seen by Mr. Sydney Webb, as well as by Mr. George Gray, a well-known

naturalist at Dover. I quote from a letter addressed to Mr. Stevens by Mr. Webb on Mr. Gray's behalf, and sold with the egg:—"Mr. Gray, of this town (Dover), who is an ornithologist and taxidermist, having been informed by some lads who had been watching birds for him that they had discovered a nest of eggs which they did not know, we were led to the spot, but only to find one young bird hatched out, one broken egg, and one addled; the latter you now have. Scarcely had the egg passed from hand to hand when one of the boys called out, 'There's the old one; look at his top-knot!' And sure enough we saw a living Crested Lark close to us. There could be no mistaking the long crest reclining backwards, Crane-like, quite unlike an ordinary Lark's raised crest." It is curious also that the birds made a second nest, from which another egg was obtained early in August. This also passed into my hands.—C. A. BRIGGS (55, Lincoln's Inn Fields).

[The common Skylark so frequently exhibits a well-developed crest, that we should not rely upon this point only to convince us that the bird whose nest was found in Romney Marsh was *Alauda cristata*. It is a pity that Mr. Gray did not carry his observation a little further, and note some other distinguishing characters of the rarer species. The large bastard primary he could not have seen, but he might have noticed the orange-tawny colour of the under surface of the wing and the absence of white from the tail feathers.—ED.]

The Dispersal of Acorns by Rooks.—In a recent number of 'Nature' Mr. Clement Reid communicates the result of some interesting observations made by him on the way in which Rooks are instrumental in dispersing acorns, and thus causing oaks to spring up in places where none had grown before. He says:—"In peat-mosses, on open chalk downs, and in ploughed fields, often a mile or more from the nearest mature tree, one constantly finds acorn-husks and also seedling oaks, which last a few months, or perhaps a couple of years, and then die, the conditions being unfavourable. It has always seemed to me, while studying the origin of the existing fauna and flora of Britain, that this dispersal of acorns ought to give an important clue to the means by which this country was again clothed when the climate became more genial after the Glacial Epoch. The oak has the largest seed of any British plant, and if it can be carried distances of a mile or more, it is evident that the whole of our present flora may have spread more rapidly than is usually imagined, and may have crossed straits and wide rivers. I have for several years noted the position of these seedling oaks, finding them in places where no mammal would take the acorns. For instance, they are common in any of the New Forest peat-bogs that are within a mile of an oak-tree. They are common also in some places on the top of the escarpment of the South Downs, half a mile from oaks, and 300 or 400 feet above them. They are always associated with empty acorn-husks, stabbed and torn in a peculiar way. In October and November Rooks feed

in the oak-trees, and I have long felt convinced that they were mainly responsible for the dispersal of acorns, though it is not easy to catch them actually doing it. On October 29th of this year I was successful. In the middle of an extensive field, bordered by an oak-copse and scattered trees, a flock of Rooks was feeding and passing singly backwards and forwards to the oaks. On driving the birds away, and walking to the middle of the field, I found hundreds of empty acorn-husks, and a number of half-eaten pecked acorns, which had not had time to change their colour—a cut acorn changes colour on exposure to the air like a cut apple, though not quite so fast. This showed that the birds had been disturbed in the middle of their feast, for the marks on the acorns were quite unlike those made by a rodent or any mammal. They were stabbed and pecked, and the husks were torn off in strips, usually starting from a puncture. It was also noticeable that many of them were not shed acorns, but were accompanied by acorn-cups, the stalks of which had been bitten to tear them off the trees. This was singular, for the ground beneath the trees was covered with shed acorns. The Rooks, however, were in the trees, not under them, and the reason for the selection of acorns in cups is probably that they are easier to carry—a shed acorn must be an awkwardly large and slippery thing for a Rook's beak, one with a stalk will be more convenient. Several uninjured acorns were found, and most of the remains occurred on smooth spots of short turf—places where a slippery acorn might conveniently be pecked without being lost. One almost uninjured acorn had been driven by a single peck deep into the soft soil of a mole-hill. It might be thought that it would be much simpler for the Rooks to feed on the ground beneath the trees. Some of them apparently do so; but the majority seem always to carry the acorns into the open. The Rook is a suspicious bird, quarrelsome, and a born thief. He seems particularly to object to a comrade watching him from any post of vantage, and the Rooks, when among the oaks, for some reason or other are always quarrelling, notwithstanding the abundance of food. An acorn dropped on rough ground, or in a peat-moss, would stand a great chance of being lost in some crevice or soft place; but the oak seeds so freely that the bird need not waste time trying to recover the lost acorn—there are plenty more on the tree. In this way the oak-woods must spread rapidly. But we still want observations as to the distance to which acorns can be carried. I have seen seedling oaks at a distance of a mile from the nearest mature tree (not necessarily the tree from which the acorn came), and have found the characteristically torn husks somewhat further away. Do Rooks roosting in elm-trees ever carry home acorns for supper? There used to be a number of Rooks which roosted in elms near Brighton in the autumn and winter, but crossed the Downs to feed in the Weald. I have often watched them returning at dusk. Do they ever bring acorns from that distance? This flock may have been responsible for the seedling oaks

near the edge of the Downs; and if it could occasionally bring an acorn still further, to Brighton, it is evident that the oak may have crossed the Strait of Dover, when it was somewhat narrower, and that Britain, so far as the oak shows, may have been continuously an island since the Glacial Epoch."—CLEMENT REID.

[The experience of Mr. Reid in this case recalls to mind some observations made many years ago in Westmorland by the Rev. Thomas Robinson, Rector of Ousby, and published by him in 'An Essay towards a Natural History of Westmorland and Cumberland,' 8vo, pp. 118 (1709). Writing on this very subject, he says:—"About twenty-five years ago, coming from Rose Castle early in the morning, I observed a great number of Crows [*sc.* Rooks] very busy at their work upon a declining ground of a mossy surface. I went out of my way on purpose to view their labour, and I found they were planting a grove of oaks. The manner of their planting was thus: they first made little holes in the earth with their bills, going about and about till the hole was deep enough, and then they dropped in the acorn and covered it with earth and moss. This young plantation is now growing up to a thick grove of oaks, fit for use, and of height for the Crows to build their nests in. I told it to the owner of the ground who observed them spring up, and took care to secure their growth and rising. The season was the latter end of autumn, when all seeds were full ripe." In this case it seems reasonable to infer that the Rooks were unconsciously planting oaks in the exercise of a natural instinct which prompts them to store up food "for a rainy day," the bulk of which is not recovered. Magpies, as is well known, have a similar habit of hiding food.—ED.]

Ornithological Notes from East Kent.—During the latter part of September and the beginning of October I was staying at the mouth of the Stour, near Sandwich, and spent a good deal of time in watching the birds on the flats. The season was somewhat disappointing, and the waders seemed very much scarcer than in former years. On Sept. 29th there were vast numbers of Yellow Wagtails, with a fair admixture of Pied Wagtails, all along the shore in the direction of Deal. Wading birds were unusually scarce, and even the ordinary *Dunlius* were far from plentiful; the flocks contained a few Ringed Plovers, *Ægialitis hiaticula*, and one or two Little Stints, *Tringa minuta*, while here and there a solitary Grey Plover, *Squatarola helvetica*, was feeding. The only birds that could be called really common were the Oystercatchers and Curlews, which were feeding in large flocks on the farthest flats. On Sept. 27th there were a great number of Knots, *Tringa canutus*, about, with one or two Godwits. We secured a Sanderling, *Calidris arenaria*, out of a flock of *Tringa alpina* from a mud-flat off the river-mouth. On the 28th we shot two Grey Plovers and two Knots, all of them immature birds. The wind began to blow keenly from the N.E., and a good many ducks came in. We had heard Wigeon and Teal passing over in the night, and a Wigeon was shot along the shore.

We watched a solitary Brent Goose, which we were told had been about for several weeks. Large flocks of Peewits were moving all day over the salt-marshes, occasionally settling on a scrub-covered island at the river-mouth. On the 29th the wind was still in the N.E., and I shot a Little Stint, *Tringa minuta*, in the salt-marshes between the "Salt pans" and the sea. The Dunlins were rapidly assuming the winter dress; one which we shot had the black breast flecked all over with white feathers, giving it a very singular appearance. A few Yellow Wagtails still remained, and we saw one Wheatear, *Saxicola ænanthe*. On Oct. 1st a carter told me that he had seen eight "Grey Geese" as he drove along the bay. We saw one Yellow Wagtail only, the last seen whilst we were there. On Oct. 2nd the wind was blowing strong from the east, and there were a large number of Wigeon about. We shot one which was sheltering under a dyke. In the course of the morning we went inland over the marshes, which are here studded with tall thorn-bushes. Seeing a black and white bird fly from the ground into a thorn-bush, I followed it up, and found that it was a Great Grey Shrike. True to its name "*excubitor*," it was too wary to let me get within shot, and would fly from one bush to another, pausing at times and hovering in mid-air like a Kestrel. After I had followed it from tree to tree for a quarter of an hour it flew across the Stour, and as there was no means of crossing the river I gave up the pursuit. On Oct. 4th I visited Mr. Sturges, the Margate taxidermist, who showed me a Grey Shrike from Margate, several Black Redstarts, Shore Larks, and Ring Ouzels from the district, a Spotted Crake from the Minster marshes, and an Osprey, shot at North Down, Thanet, on July 1st, in spite of the provisions of the Wild Birds Protection Act.—SUTTON A. DAVIES (Pembroke College, Oxford).

Escape of a Caged Eagle.—With reference to the remarks which have appeared on this subject (pp. 380, 434), Mr. H. S. Davenport writes to the effect that he had no reason to suppose that the Eagle seen in his neighbourhood and subsequently shot at Easton was a tame one; and he adds, that as the Eagle which escaped from the Bristol Zoological Gardens (p. 380), was supposed by the keeper to be a *female*, while the one killed at Easton was ascertained by dissection to be a *male*, he feels justified in rejecting the suggestion (p. 434) that they were one and the same bird.

American Yellow-billed Cuckoo: Important Correction.—The species of bird which, to the number of ten or fifteen, came on board the s.s. 'Ottoman,' when off Cape Race, on the voyage from Boston to Liverpool (p. 433), and which was thought by Mr. Neilson to be "probably identical" with the American Cuckoo that was picked up dead a few days later in Dorsetshire (p. 376) has been at length identified. Mr. Neilson has to-day (Dec. 10th) kindly sent me the sole survivor of those that were caught, and it proves to be a female Snow Bunting, *Emberiza nivalis*.—J. E. HARTING.

REPTILIA.

Adders swallowing their Young.—I think your correspondent, Mr. Mansel Pleydell, assumes on insufficient evidence that female Adders are provided with a cavity separate from the stomach for the reception of their young. An incident came under my own observation, and was duly reported in 'The Zoologist' for June, 1889, of an Adder rejecting a Lizard alive and uninjured, at least twenty-four hours after swallowing it. Having been taken for food, the Lizard must have been in the Viper's stomach all that time.—R. H. RAMSBOTHAM (Monkmoor, Shrewsbury).

[If we mistake not, it has been ascertained by experiment that the gastric fluid acts much more slowly upon living tissue than upon dead prey. If so, the temporary retention of young Adders in the stomach of the parent would not necessarily be fatal to them, as has been supposed. See Putnam, 'American Naturalist,' vol. ii. p. 133.—ED.]

 SCIENTIFIC SOCIETIES.

LINNEAN SOCIETY OF LONDON.

November 7th, 1895.—MR. C. B. CLARKE, F.R.S., President, in the chair. Mr. George Masee was admitted a Fellow of the Society.

Several volumes of Cryptogamic exsiccata recently received from Madame Weddell as a bequest from her late husband, a Foreign Member of the Society, were shown, and some remarks made thereon by the Botanical Secretary.

A portrait of the French naturalist Guillaume Rondelet, Professor of Anatomy and Chancellor of the University of Montpellier, 1545, recently presented to the Society by Dr. H. Woodward, was exhibited by the Zoological Secretary, who gave an account of his life and work, supplemented by remarks from the President.

Mr. C. T. Druery exhibited and made remarks on a *Scolopendrium* raised by Mr. E. J. Lowe, bearing archegonia and antheridia upon the fronds, constituting a more advanced phase of apospory than any previously noted. Some additional remarks were made by Mr. George Murray.

Dr. Maxwell T. Masters exhibited specimens of the fruit of *Pyrus sorbus*, *Aberia caffra*, and small fruits of *Cocos australis*, from the gardens of Mr. Thomas Hanbury at La Mortola, Mentone, and some large fruits of *Cocos australis* from Naudin's garden at Antibes, Alpes Maritimes.

Mr. J. E. Harting exhibited a specimen of the American Yellow-billed Cuckoo, *Cuculus americanus*, which had been picked up dead in a garden at Bridport, Dorsetshire, on Oct. 5th, as recorded in 'The Zoologist' for October (p. 376), and gave some account of the wanderings and previous occurrence of this species in the British Islands. As showing the means

whereby land-birds sometimes cross the Atlantic, he read a letter from Mr. Ralph Neilson, of Fulwood Park, Liverpool, dated October 31st, in which the writer stated that during a recent voyage from Boston, Mass., in the steamship 'Ottoman,' when off Cape Race, ten or a dozen birds, "probably identical," came on board, and several were captured.

A paper was read by Col. Swinhoe on mimicry in butterflies of the genus *Hypolimnas*, Hübner. Illustrating his remarks by a series of coloured lantern-slides, he described the changes in mimetic forms in a single genus of nymphalid butterflies, from India through Arabia to Africa, and from India through the Malay Archipelago to Australia, commenting upon the resemblance they always bear in colour and pattern to different forms of *Danais* and *Euphlea*, insects well known to be distasteful to birds and reptiles.

Mr. G. F. Scott Elliot communicated a paper entitled "A Revision of the genus *Pentas*," in which some account was given of the distribution of those plants in Africa, with a rectification of the synonymy, and description of five new species. The genus as a whole showed in a remarkable manner the way in which local species occur wherever a different climate restricts the distribution of a wide-ranging form, and several examples of this were mentioned. A discussion followed, in which the President, Mr. W. P. Hiern, and others took part.

On behalf of Dr. A. G. Butler, an abstract was read of a paper on Butterflies of the genus *Charaxes*, of which 150 species were recognised, nearly all of which were represented in the National Collection. Five species—*Charaxes princeps*, *C. repetitus*, *C. layardi*, *C. fervens*, and *C. coniger*—were described as new.

November 21st.—Mr. J. G. Baker, F.R.S., Vice-President, in the chair.

His Grace the Duke of Bedford, Messrs. Bernard Arnold, and E. B. Fernan were elected Fellows of the Society. Mr. B. B. Woodward was admitted.

The Rev. G. Henslow exhibited a MS. commonplace-book of the latter end of the 14th century. The entries in Latin and English were found to consist chiefly of medical recipes, in which about 200 plants are named for their use, and some new methods of distilling *aqua vitæ* are described. There were also some notes on geometry and astronomy, and calculations of altitudes and superficies. Mr. Baker thought the number of plants named at the date referred to was a matter of interest to botanists, and suggested publication of the list of names, with their identification where possible.

Mr. Henslow also exhibited a series of shells of *Buccinum undatum* and *Fusus antiquus*, showing the variation in form which occurs in the reparation of injury sustained at an early stage of life, the subsequently renewed whorls assuming shapes resembling those of other species in the

same genus, and even in other and very different genera. Usually the uninjured whorls could be detected by the apex being of the normal character, but in some cases the abnormality appeared to be congenital, being carried completely into the apex. This raised the question whether these were acquired characters and hereditary, having been impressed upon the offspring born after the parent shell had been injured and renewed by growth. Mr. E. R. Sykes and Mr. B. B. Woodward offered some criticism in the discussion which followed, deprecating the suggestion of anything like "mimicry," and regarding the resemblances in question as purely accidental.

Mr. T. H. Buffham exhibited lantern slides of a red marine alga, *Bonnemaisonia hamifera* (Heriot), known previously only from Japan, and found floating on the sea at Falmouth. It was suggested that if it had been introduced from Japan it could only have been from spores, or possibly the hamose branches might develop into plants, since the Falmouth specimens were quite fresh, and must have been living near the place of discovery.

Dr. D. Morris, C.M.G., read a paper on the development of a single seed in the fruit of the cocoa-nut palm (*Cocos nucifera*). Alluding to the occurrence of palms with twin and trifid stems arising from one base, it was shown that these were due: (1), to several seeds in one fruit; (2), to more than one embryo in a seed; or (3), to a branching of the primary shoot. In cases cited by Rumphius, Forbes, and others, several seeds were found in one fruit. The course of development of the single cell was illustrated by means of lantern slides.

On behalf of Mr. A. J. Ewart, Prof. Harvey Gibson gave an abstract of a paper on "Assimilating Inhibition, the Causes by which it may be induced, and their influence on Vitality." The paper dealt mainly with the discussion of experiments with a large number of plants, and criticism of the results arrived at by other investigators. A discussion followed, in which Dr. Scott, Prof. Reynolds Green, and Prof. Weiss took part.

Mr. A. C. Seward gave the substance of a paper "On a New Species of *Pinites* (*P. Ruffordi*) from the Wealden beds of Sussex."

ZOOLOGICAL SOCIETY.

Nov. 19th, 1895.—Sir W. H. FLOWER, K.C.B., President, in the chair.

The Secretary read a report on additions made to the Society's Menagerie.

A letter was read from Mr. J. H. Gurney respecting a Kingfisher, *Alcedo beavani*, resident in Ceylon.

Mr. Sclater gave a short account of certain animals noticed in the Paris Gardens during a recent visit. He also exhibited the skin of a Zebra from Nyasaland, obtained by Mr. R. Crawshay, and a fine pair of horns of Living-

stone's Eland, presented by Mr. H. H. Johnston, C.B., and obtained in 1893 between Zomba and Lake Chilwa.

Col. L. H. Irby exhibited two British-killed specimens of the Greater Bullfinch, *Pyrrhula major*.

Mr. W. T. Blanford exhibited skins of *Capra sibirica* and of *Ovis ammon*, killed by Major Cumberland in the Altai Mountains.

A communication was read from Mr. Swale Vincent, in which he described the naked-eye and microscopical anatomy of the supra-renal bodies (secreting glands) in the different orders of Fishes. They were present in all the *Elasmobranchii*, *Holocephali*, *Ganoidei*, and *Teleostii*, and probably also in the *Dipnoi*. He found no relation between the supra-renal and the lymphatic head-kidney.

Mr. Gerard W. Butler read a paper on the complete or partial suppression of the right lung in the *Amphibænidæ*, and of the left lung in Snakes and snake-like Lizards and Amphibians. It was an invariable rule that in the *Amphibænidæ* the right lung was the smaller, and usually rudimentary or absent, while in all the other cases of inequality it was the left lung which was the smaller.

Mr. W. Saville Kent made some observations on the Frilled Lizard, *Chlamydosaurus kingi*, of Western Australia. He was inclined to regard it, if not as a surviving representative of the Dinosaurian Reptilia, as, at any rate, a most interesting and anomalous lacertilian type that inherited its characteristic bipedal method of progression from that extinct group. His remarks were illustrated by photographs from life in characteristic attitudes, and by specimens which had been mounted in accordance with those photographs.

Two communications were read from Dr. A. G. Butler, on a small collection of Butterflies made by Mr. Alfred Sharpe, Consul at Zomba, British Central Africa, and on some Lepidoptera collected in Eastern Central Africa by Mr. G. F. Scott Elliot.

A communication was read from Mr. G. S. West, on the buccal glands and teeth of certain poisonous Snakes. The author showed that in the Opisthoglyphous Snakes the poison-gland is very variable both in form and extent, and that its duct opens into a cavity formed by muscular folds surrounding the grooved tooth. This opening is always towards the outer side of the grooved tooth, and situated either at its base, or but a short distance from it, and the parts were shown to be so related that the loss of the tooth does not cause any injury to the duct. The reserve teeth were shown to be in no way connected with the duct until called upon to replace teeth that had been lost.

A report was read from Mr. W. H. Ashmead upon the Parasitic Hymenoptera of the Island of Grenada, comprising the families *Cynipidæ*, *Ichneumonidæ*, *Braconidæ*, and *Proctotrypidæ*, of which 128 were described as new.—P. L. SCLATER, *Secretary*.

NOTICES OF NEW BOOKS.

British Birds. By W. H. HUDSON. With a chapter on Structure and Classification by F. E. BEDDARD. Crown 8vo, pp. 1—xxii; 1—363. With 8 coloured plates by A. THORBURN; 8 plates and 100 figures by G. E. LODGE; and 3 illustrations from photographs by R. B. LODGE. London: Longmans, Green & Co. 1895.

MR. HUDSON'S name is already so well known as that of an observant outdoor naturalist and agreeable writer of travels, that a new book from his pen is sure to be well received. His newest volume is a most attractive one. The coloured plates by A. Thorburn, and the black and white sketches of birds by G. E. Lodge are charming, and recommend the book at once, quite irrespective of the letterpress. It is by the latter, however, that the merit of the work will be gauged, and Mr. Hudson's qualifications as a writer on British ornithology will be estimated.

Frankly speaking, we opine that Mr. Hudson is a safer guide when discoursing of the birds of La Plata than when dealing with those of Great Britain; for the simple reason that he has spent a longer time in studying the avifauna of a South American province than he has been able to devote to similar studies in England. The title of his book strikes us as being too comprehensive, since it by no means includes every bird which finds a place in the British List. On the contrary, we could give a long list of species omitted, and a still longer list of species of which the treatment is so brief—often three or four lines only—as to be quite inadequate for a work with so comprehensive a title. For example, we read on page 82, that besides the Reed and Sedge Warblers, “three more species have been numbered as British birds, having been found as stragglers in this country. These are the Marsh Warbler, the Great Reed Warbler, and the Aquatic Warbler.” Now, considering that the two first named have both been found nesting in this country, where the first mentioned is probably an annual, though local, summer migrant, while the third is known to have been met with on at least four occasions, we may well demur to so slender a notice of them. A similar remark applies to what is said of the White Wagtail, dismissed in two lines (p. 108); of the Water Pipit, of which the

only information given (p. 113) is that "a very few specimens have been obtained in different parts of the country"; of four species of Shrike (p. 116), one of which, *Lanius excubitor*, as might have been stated, is a regular winter visitor; of the Ortolan and Lapland Buntings, each of which is dismissed in three lines; of the Shore Lark, which is accorded two lines; and so forth. Such treatment we regard as quite inadequate, and the same may be said of what Mr. Hudson has to tell us concerning many other well-known species. It is evident that with many of the birds described, Mr. Hudson has had little or no opportunity of making himself personally acquainted. He has therefore had to rely upon secondhand information, which in many cases is not up to date: witness, for example, the meagre account of the nesting in Scotland of the Snow Bunting; of the Chough, whose breeding-haunts in Scotland and Ireland are ignored (p. 158); of the Grey Plover (p. 286), the Little Stint (p. 302), the Knot (p. 305), and many others. On the whole we are disappointed with the letterpress, which is in many respects below the standard of excellence required at the present day. It is perhaps hardly to be expected that a writer on the subject of British birds should be personally acquainted with every species on which he writes, but in the case of those with which he is not familiar there is abundant trustworthy information to be found, if the author knows where to look for it. A want of sufficient acquaintance with the literature of the subject is apparent throughout the volume. With so many county bird-books at hand for reference, there is no excuse for writing of the Black Grouse (for example) as extinct in the south of England, "except in the New Forest, where a few birds survive." This misapprehension would have been at once dispelled had the author consulted the excellent and reliable works of Borrer, Mansel Pleydell A. C. Smith, Cecil Smith, D'Urban, and Murray Mathew, in which he might have found sufficient evidence of the existence of this fine game-bird in Surrey, Sussex, Hants, Dorset, Wilts, Somerset, and Devon, to say nothing of its haunts in Herefordshire, and South Wales, as vouched for by other observers.

But although Mr. Hudson's book may not come up to the standard expected by professed ornithologists, it will perhaps satisfy the requirements of ordinary readers, and the information given will be acceptable enough so far as it goes; while the

numerous illustrations with which it is embellished make almost sufficient amends for the shortcomings in the text, which may be improved in a future edition.

A Monograph of the Land and Freshwater Mollusca of the British Isles. By J. W. TAYLOR. With the assistance of W. D. ROEBUCK, C. ASHFORD, and others. Part II., pp. 65-128. With coloured frontispiece and numerous illustrations. Leeds: Taylor Brothers, Sovereign Street. 1895.

THE first part of this new work on British Mollusca was reviewed in the number for February last (pp. 79-80), when we took occasion to commend the thorough mode of treatment adopted by the author, and the excellence of the illustrations, which are numerous. In Part II., now before us, we are pleased to see this high standard of merit maintained. The author, continuing his introductory observations, deals in this number with the subjects of variation in form and size, colour and markings, monstrosities, and auxiliary and protective organs. Size is influenced not only by the obvious causes of the abundance or scarcity of suitable and nutritious food, but is also in a great degree dependent upon temperature and other circumstances. The researches of Semper on the phenomena of growth upon which size is dependent, have shown that in *Limnæa stagnalis*, for example, the size attained by the shell is capable of correlation with the temperature and amount of the inhabited water, as assimilation and growth equally ceased if the degree of warmth exceeded 90° F., or fell below 53° F.; the fullest vigour being enjoyed, and the largest size attained when the temperature ranged between 68° F. and 77° F. The results of these researches are of great interest, and are more or less applicable to other species, as demonstrating some of the conditions governing growth—and therefore size—in Mollusca generally; and clearly establish that the volume or amount of water allowed to each mollusc is so decisive in its effect upon growth, that in the space of six days, the difference in the size of the shells of those in a large and those in a small body of water becomes apparent; the smaller the amount of water per individual the smaller the shell, and *vice versâ*.

The colouring of the Mollusca, according to Mr. Taylor,

seems largely dependent upon the action of light. The more exposed surface of spiral shells, and the posterior end of burrowing bivalves, are usually more richly coloured or ornamented than the less exposed or buried portions, and colouring generally is probably of great biological importance. It is also, as in other groups, most pronounced in brilliancy and variety in the warmer regions of the globe, and becomes gradually reduced in diversity and beauty as the poles are approached. These facts led Dr. Fischer to propose for the Mollusca three zones of colouration corresponding with the thermal ones.

An examination of several thousand specimens of *Helix nemoralis* from the sand-hills at Spurn Point, Yorkshire (one of the driest spots in the kingdom), showed that scarcely a dozen of them exhibited evenly developed and strongly marked banding; the bands, when present, were all more or less broken up and disconnected. In this section of the general subject, Mr. Taylor gives a score of excellent figures to illustrate his remarks.

No less interesting are his observations on monstrosities. All molluscs with spiral shells are liable to a reversal in the direction of their convolution; and bivalves, and even slugs, says Mr. Taylor, are affected in an analogous way. The causes of this reversal of the normal arrangement are, however, not at all known or understood. M. Bourguignat has hazarded the suggestion that it may be caused by electrical conditions, the electric current flowing in the opposite direction to the embryonal rotation, the essential conditions being a metalliferous soil, moist weather to influence the latent electricity of the metallic substances, and the conjunction of the atmospheric and terrestrial electricity, as by thunder at the period of first manifestation of vitality by the embryo.

Prof. Carus, also, considers that the direction of the coiling of the shell and animal may possibly be determined by the direction of the embryonal rotation. These and other kindred topics are fully discussed and elucidated by Mr. Taylor, who brings a wide knowledge of the literature of the subject to bear upon his own researches, and those of his colleagues. His remarks upon Auxiliary and Protective Organs are especially interesting, but to discuss them here is not possible in the limited space at our disposal. We must be content to congratulate the author upon the progress of his work, and recommend it to our readers as one

which promises to be a standard book of reference on the subject of which it treats.

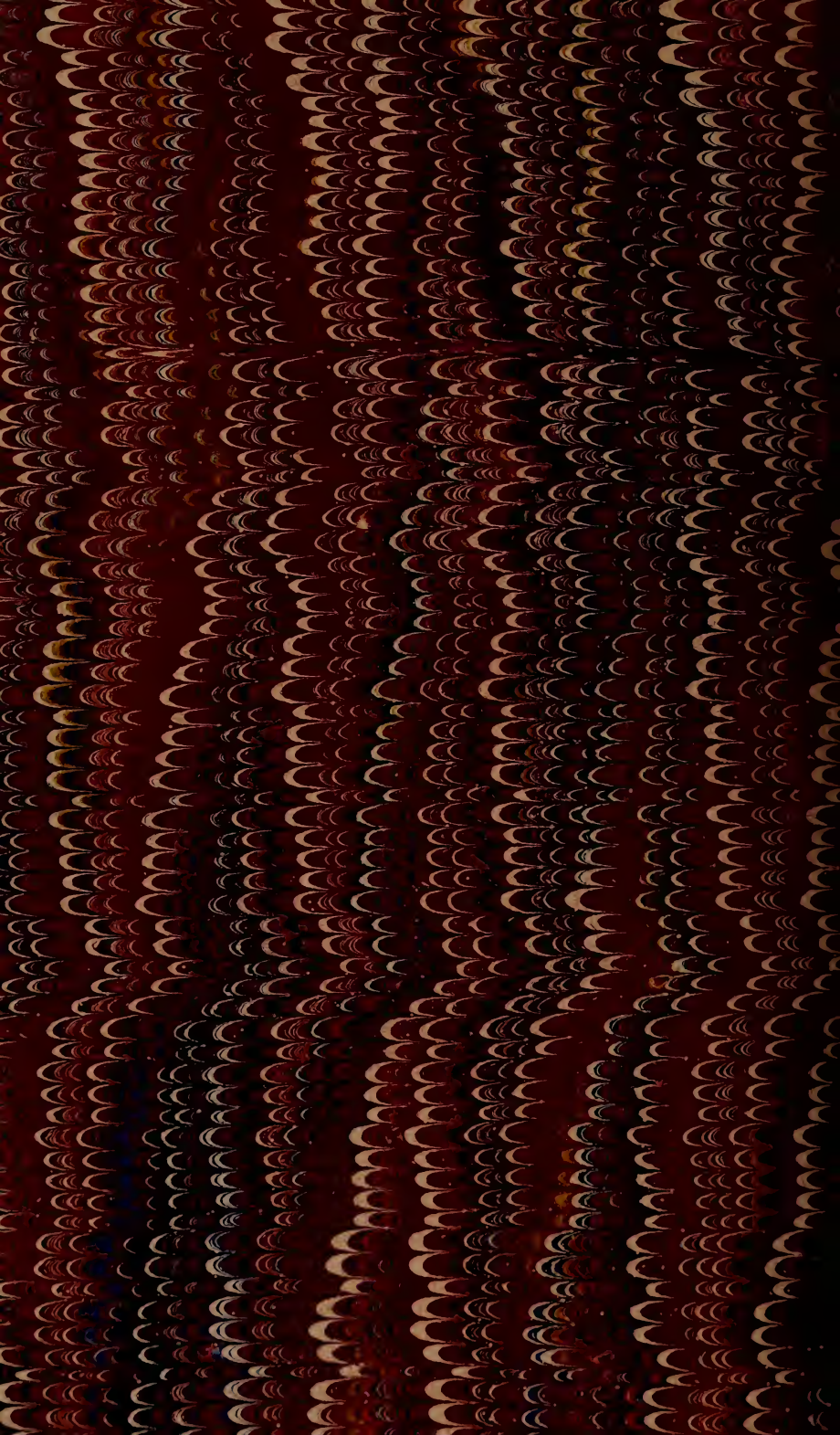
A Handbook of British Lepidoptera. By EDWARD MEYRICK. 8vo. pp. 843. With text cuts, showing the Neuration of Typical Species. London: Macmillan & Co. 1895.

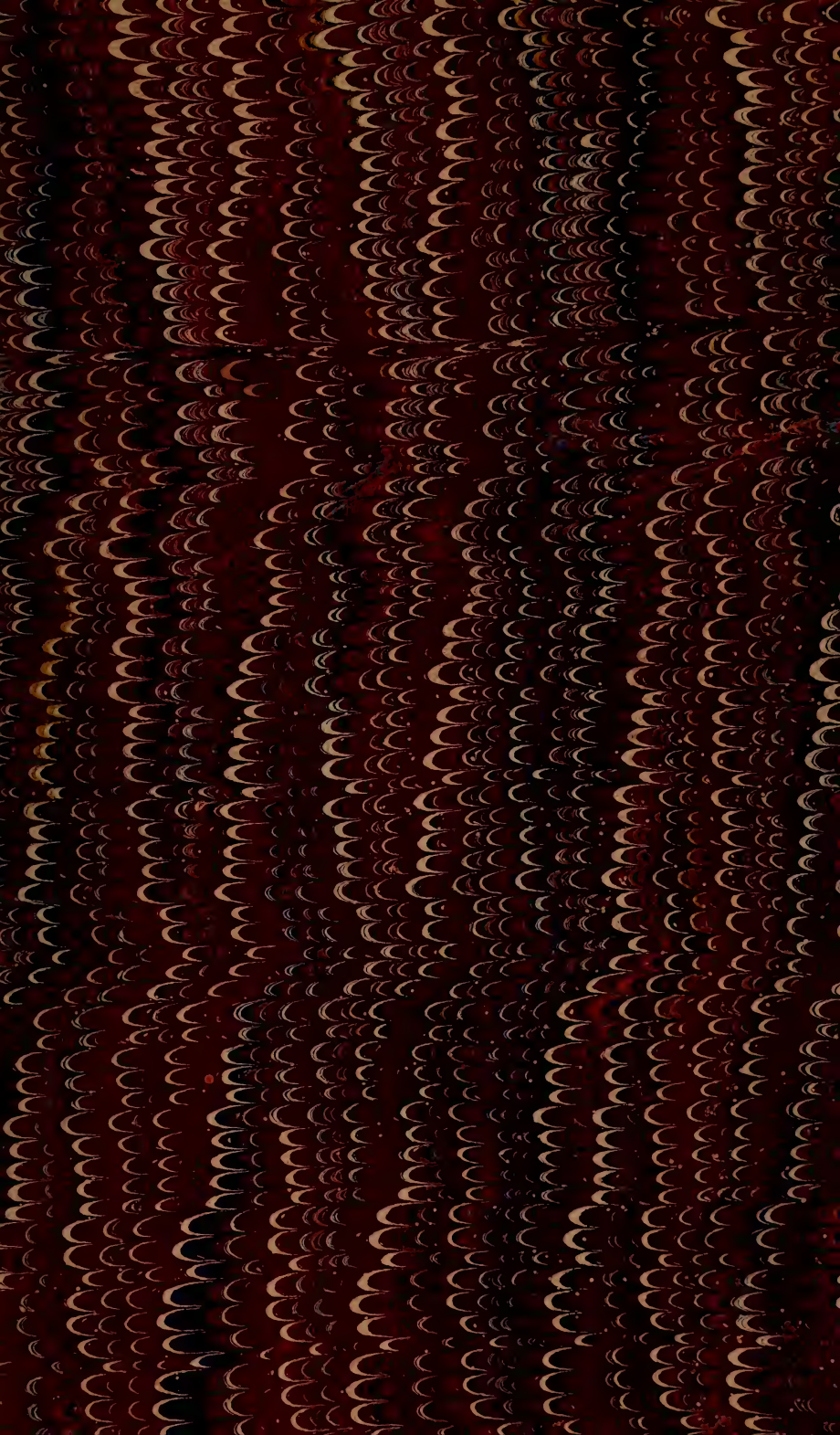
In a well written Introduction of twenty pages, Mr. Meyrick foreshadows the plan and scope of his work, which may be commended for its originality and comprehensiveness. The preparation of more than 800 closely-printed pages indicates a vast expenditure of thought and labour, which it is to be hoped will not have been bestowed in vain. Entomology is a subject which seems to increase annually in popularity, and of late years has been rendered more than ever fascinating through the efforts of workers like Miss Ormerod, and some of the American State Entomologists, who have given us such interesting life-histories of many of the insects which are injurious to agriculture. This, however, is not Mr. Meyrick's aim in the present volume, which is an elementary guide to the classification of the Lepidoptera, designed to enable collectors to identify specimens with accuracy, and acquire such general knowledge of structure and affinities as ought to be possessed by every student of Entomology before proceeding to more special investigations.

The chief merit of this work, so it seems to us, lies in the fact that the structural characters have in every instance been described from the author's own observations. The importance of this becomes apparent when we remember that Stainton's 'Manual of British Butterflies and Moths,' so long regarded as a leading text-book, is sadly deficient in this respect, since it affords no satisfactory information on structural distinctions (except in the *Tineina*, which that author had specially studied), the nearly valueless characters assigned to the other groups being simply copied from other writers, and mainly from the pseudo-scientific work of Guenée.

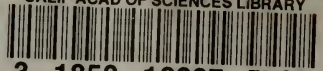
Mr. Meyrick's 'Handbook,' on a sounder basis than the 'Manual,' bids fair to supersede it. From it a species may be quickly identified by means of the Analytical Keys which form a special feature of the work, and following the "Introduction" is a useful "Glossary," and a "List of Abbreviations of Author's names."

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