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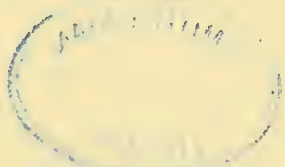
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P R E F A C E.

THE most notable event to ornithologists during the past year has been the meeting of the fourth International Ornithological Congress, which was held in London last June. With that we may couple the interest aroused in the study of Dinosaurs by the presentation of a reproduction of the skeleton of *Diplodocus carnegii* to the British Museum.

Our present volume exhibits no diminution in the number or value of its contributions, while it is a matter of congratulation to all concerned that few books are now published on the British fauna without at least some, and usually many, references to the pages of 'THE ZOOLOGIST.' This year several Orders have received considerable attention, and have been the subjects of some permanent contributions.

MAMMALIA.—Two new species of Gorals from British India have been described; the true position of *Mus rattus* and its British allies has been discussed by one who is doing much on the subject of our insular mammals; the valuable series of papers on the northern Seal and Whale industries have been continued, as well as a host of smaller contributions, which range from the disappearance of a local form of Squirrel in India to a peculiar osteological variety found in the domestic Cat at Yarmouth.

AVES.—Our well-known contributors have continued their county lists and bionomical observations. The birds of Wales have now received very full attention in these pages, and it is strange indeed that so much was hitherto unrecorded on the

subject; the list of rare visitants has been substantially augmented, and the truth again emphasized that in British ornithology alone new facts and observations still await the diligent field naturalist.

PISCES.—There has been this year a most welcome interest exhibited in relation to British fishes and rare piscine visitants. The most interesting event has been the reappearance of a species of Flying Fish in the estuary of the Thames, and the consequent publication in these pages of a paper containing a full *résumé* of our knowledge on the subject. It is, however, much to be desired that other yearly reports beyond that from Yarmouth should appear in 'THE ZOOLOGIST.'

As regards some other and more neglected Orders, we have reason to hope that promised attention will be devoted to them in our next volume.

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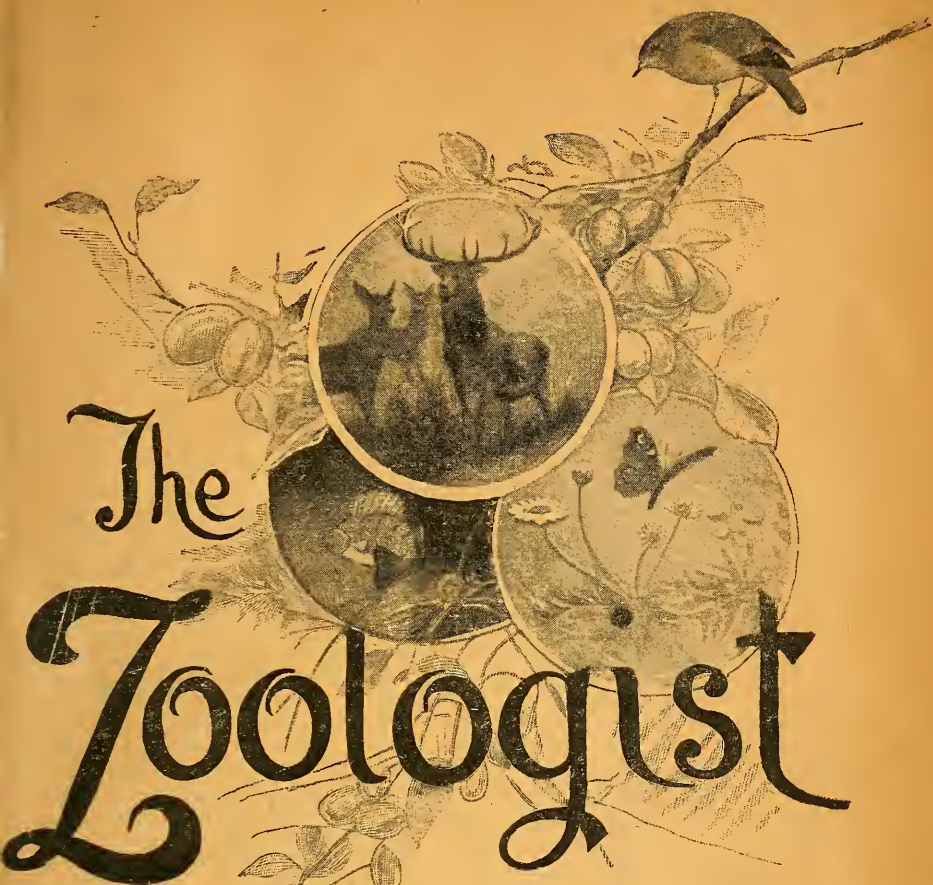
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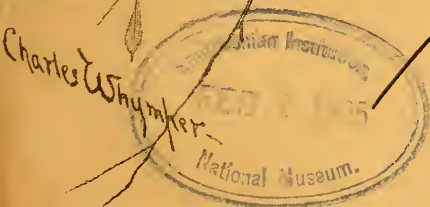




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THE ZOOLOGIST

No. 763.—January, 1905.

ON BUDDING IN ANIMALS.

By Prof. McINTOSH, Director of the University Museum, and
of the Gatty Marine Laboratory, St. Andrews.

THROUGHOUT the Vegetable Kingdom budding and branching are two of the most familiar terms, as well as most salient features. Thus, for instance, the horticulturist introduces into a slit in another plant a bud with a fragment of bark from a rose, and he separates the bulbil from the axil of the leaf in the bulbiferous lily, and inserts it in the ground. The arboriculturist, again, by the spray of the branches against the wintry sky, can distinguish the species of tree, and he utilizes the ready growth of branches in the formation of a quickset hedge. In the higher forms of animal life—such as the Vertebrates—on the other hand, Harvey's morphological generalization of "*Omne vivum ex ovo*" holds without exception, and we have to make a considerable descent in the zoological scale before meeting with an approach to the condition in plants, *viz.* budding and branching. In certain of the more lowly organized types, however, both conditions are often conspicuously present.

And here let me explain that by budding is meant that condition in which an offshoot or new animal arises from a parent-stock or nurse-stock as a rudiment, and gradually develops into the form of the parent, a portion—it may be a very small portion—of whose structure is originally utilized in its formation.

Some observers and many writers draw hard and fast distinctions between budding and fission (binary, cross, longitudinal, and diagonal). The former (budding) is said to occur—for instance, in the simplest animals—when the portion separated is smaller than the parent, the latter (fission) when it is about the same size. Again, in an animal with a linear series of segments, the term budding is applied to those instances in which from one or two segments a complete animal with head and internal organs is formed; while fission is said to take place in those cases in which a considerable number of the adult segments are cut off to form the new animal, the diameter of which is thus more nearly that of the parent-stock. But it is clear that if in the latter case a new head, brain, and sense-organs are developed out of an ordinary segment, it also is more or less an example of budding.

In dealing with certain divisions of the subject, however, more precise terms are employed. Thus, for instance, in the Marine Annelids, the terms “schizogamy” and “scissiparity” are generally used.

In *schizogamy* (Syllids, &c.) a part of the individual only acquires ova or other elements, and separates. The head of the bud has large eyes, but no mouth, and only serves to disseminate the ova or other elements, and then disappears. No new products are formed. *Scissiparity* (fission) differs from schizogamy in so far as it is a veritable multiplication, the two (parent and bud) resembling each other, and developing either ova or other elements independently.

In the lowest group of animals, the Protozoa, simple division of the body is very common, but in many (e. g. *Arcella* and *Pelomyxa*), after conjugation, numerous buds, which are smaller than the parent, are given off at once. Moreover, in such as *Codosiga*, a colony is formed by budding, and, as in this and other instances the buds do not separate, the branching structure resembles a miniature zoophyte.

In these simply organized animals budding would appear to be the most natural method of increase, the buds either remaining separate and gradually attaining the bulk of the original, or, as in *Codosiga*, developing into a continuously branched organism. As true eggs are unknown in the group, there can

be no question as to whether increase can be most advantageously carried out by the one method or the other, and this has to be borne in mind in considering Weismann's remark,* that in the lower animals, "whenever increase apart from the ordinary method became advantageous, it was more readily and better supplied by fission and budding." Moreover, as in these minute animals there is no distinction of the sexes, nature is deprived of one of the means she is stated to employ to produce variation (Brooks and Weismann). Further, no clear differentiation into elements destined to build up the body (somatic) and those associated with the continuance of the species (though the nucleus has long been connected with the latter) exists, and thus the process of budding is simplified. Lastly, it is difficult to trace any relationship, in such forms, between the budding and special adaptation due to demands made by the conditions of life.

In the great division of the Metazoa budding in one form or another especially characterizes the lower types. Thus buds are common amongst the Sponges, and various species can be multiplied by cutting off pieces and planting them on suitable sites. The bath-sponge of the Levant (Turkey-sponge), for instance, has been successfully propagated in this manner. Complex branching is likewise prevalent in the group, and the two features just mentioned probably weighed with the illustrious Ehrenberg in tenaciously asserting that Sponges were vegetables. The so-called gemmules, again, found in such species as the fresh-water Sponge (*Spongilla*) are modifications of buds. As eggs of the ordinary kind occur in these animals, and are in many forms the chief method of spreading them in the waters around, a choice between the two modes of increase is now possible, each being adapted, as in the fresh-water Sponge, for its special season. The formation of gemmules, that is, little masses of sponge-tissue, in addition to the ordinary method of increase, probably was slowly acquired, first by the separation of the little masses of sponge-tissue, then the formation of a capsule, and, lastly, by the modification of the remarkable spicules characteristic of the latter. Sponges which formed buds of this kind might be supposed to have a better chance of

* II., p. 216.

survival than those which did not, but they would less quickly spread the species over a wide area.

The remarkable persistence of types like *Cliona*, which not only form branches freely, but bore in calcareous rocks and shells, is a striking feature in the group. The moniliform and branched tunnels in dead shells are conspicuous on the celebrated shell-beach at Herm; besides boring in living shells, it is thus one of the main agents in disintegrating shells on the sea-bottom. Their beautifully dendritic patterns—with the enlargements where the oscula occur—are well seen in the very thin lower valves of southern *Anomia*, which are too thin for the boring of any known annelid, and especially of the cosmopolitan *Polydora*. A distinguished author formerly held that sponges did not bore, but only took possession of the tunnels of such annelids as *Polydora* in shells and rocks. A very thin (almost like paper) lower valve of *Anomia* was sent to him in spirit without remark. When held to the light the moniliform and finely branched tunnels of *Cliona* were clearly seen with the oscula at the enlargements. Nothing could have been more convincing, and, so far as known, no further remarks on the subject were made.

In no group is budding more conspicuous than in the hydroid stocks of the Cœlenterates, as shown in the simplest condition in such as *Hydra*, and in a more complex manner in the plant-like tufts of the hydroid zoophytes, which are either dimorphic or polymorphic. As the food-canal of the entire colony is continuous, it is evident that by this process of branching the balance is more or less maintained, since new mouths and additional predatory tentacles spring into existence with the other parts of the organism. Moreover, great variation occurs in the nature of the buds, which Arnold Lang calls the sisters of the nutritive polypites; for, whereas in some the buds containing the eggs and sperms remain attached, in many they swim freely as the delicate glassy circles—the familiar jelly-fishes or hydro-Medusæ—so that buds from the most distant parent-stocks commingle. And, as if even these steps were not sufficiently complex, we find that in certain species (*Codonium*, *Lizzia*) these transparent swimming jellies give off others by budding from the stalk (*manubrium*), or from the edge of the

umbrella or disk (*Hybocodon* and *Sarsia prolifera*). Buds are also seen in *Hydra tuba*, the primary condition in the development of the scyphomedusæ such as *Aurelia*. The whole group of the Corals, again, is characterized by free budding and branching, so that the outlines of many are beautifully arborescent, for, as a rule, the new growths remain attached to the old. In *Fungia*, however, the young Coral is budded from a fixed axis or stock, and subsequently leads an independent existence.

Why, it may be asked, is budding so prominent in the Cœlenterates? Is it due to the fact that the so-called "somatic cells" of Weismann still retain a certain capacity for renewing the species, so that a small number of them are able to give rise to a new organism in the form of a bud? But some of these cells likewise develop the ordinary differentiated elements for increase, so that their functions would seem to be twofold. Moreover, in forming the Medusa-bud, it is possible that besides the "somatic cells" from the axis (blastostyle) the reproductive cells may be introduced into the developing bud, and give rise at a subsequent stage to the eggs or other elements characteristic of each.

The plant-like form of the chief examples of the group, moreover, is most favourable for continuous budding, so that by such means, for instance in the hydroid zoophytes, the capsules containing the eggs or other elements are greatly increased in number on any individual stock. Such certainly would be an advantage to the species. In the same way in other forms the swimming jellies or medusoids which are budded off to develop the eggs or other elements give the species enormous powers of distribution—powers which the mere discharge of eggs or larvæ on the site of the parent-stock could scarcely accomplish. But though these little jelly-fishes carry the eggs to distant regions, and mingle with others reared in diverse localities, it has to be shown that those which have this means of dispersion are greatly more abundant than those which do not possess them. Certainly such rapidly growing forms as *Obelia*, with their swimming buds, would appear to be more plentiful in some localities than Sertularians, which develop directly, and which would seem to be the more primitive type, since the distribution of the eggs by means of the Medusa-bud is a more complex

arrangement. Again, the duration of the life of the stocks from which the buds issue is an important point, because it is possible that some may be annual, as in the case of *Gonothyraea Loveni* on the Mussels of the Eden, and as likewise occurs in the fresh-water Polyzoa. The budding of the somatic cells of the organism therefore would not alone suffice to preserve the species, and hence the necessity for a method resulting in the development of a pelagic medusa in which the eggs are produced, and, moreover, carried throughout the ocean to new sites by its intrinsic swimming powers and the effects of currents.

¶ In connection with the budding and branching of zoophytes, some very interesting observations have recently been made by Jaques Loeb.* It is known that the growth of zoophytes takes place according to certain definite laws, the inferior end sending off root-like processes, while the upper continues the axis, and gives off branches with the cups for the polypites. Loeb found that if the zoophyte (*Antennularia*) is suspended in sea-water upside down the lower end (now the upper) gives off branches with the polypites on the upper side, while the former upper end gives off roots. If placed horizontally, the branches on the lower side grow vertically downwards in the form of root-like processes, which fix themselves to the surface of the glass (geotropic). The branches on the upper side either perish or produce long slender perfectly straight stems, which grow vertically upwards. At parts of the upper surface of the main axis, however, new stems grow vertically upward, and give off typical little branches with polyps. If placed obliquely with the normal upper end highest a new stem arises from the apex, and roots from the lower end, while if inverted the same thing happens. Gravitation thus appears to determine the place of origin of organs. In fragments of *Margelis* (*Bougainvillea*) all the stems which touch the glass give rise to roots, the free parts giving origin to polypites. Contact with a solid body thus plays the same rôle as gravitation does in *Antennularia*. In *Pennaria* he produced roots at both ends of a small stem that bore no polyps. If a solid body be brought into contact with it, it begins to grow away from it, and the new stem is soon nearly perpendicular to the surface. The foregoing manifestations are called by Loeb "Heteromorphism."

* Biol. Lect., Woods Hall, 1894, p. 37 *et seq.*

Again, he found that if a piece of *Tubularia* was suspended in the water horizontally by the middle, it produced a head at each end. It is interesting in this connection to remark that *Cerianthus*, one of the anemones frequenting sand, gives off tentacles from the aboral margin of a wound of the body-wall.

It is worthy of note that in the phylum of Echinoderms budding is generally absent from the adult as a normal mode of increase, though it is well known that renewal of lost parts is very general, a disk regenerating arms and a detached arm reproducing a disk and other arms. Yet in *Linckia* (*Ophidiaster*) *multiflora* buds arise from the tips of the rays. The regularity of their stellate bodies and their brittle nature do not seem to favour this method of development, though there may be other and more occult causes. In the young condition of several members of the group, however, the rudiment of the adult is budded off from a remarkable larva (*Echinopædium*), or from a reptant form (as in *Cribrella*). These larvæ therefore contain within them the germ-plasm from which the adult is formed, and which at a certain stage develops, while the larvæ themselves disappear. The adult is thus in one sense a bud of the larva, and the one is indispensable to the other, for no bud could be formed if the larvæ were swept off at an early stage. Such types therefore appear to encounter a double series of dangers—first as larvæ which never attain the adult state, and, secondly, as minute buds from the former, which have to pass through early and precarious stages before reaching the adult form. It has to be borne in mind, however, that in many the larval stages are pelagic while the adults live on the bottom, so that the conditions of life are very different. Nevertheless, some might suppose that it would have been sufficient for such forms to have sprung directly from eggs—pelagic or otherwise—without the foregoing complex larval stages—for example, that resembling a painter's easel, with its remarkable spicular skeleton. Such may have arisen from the necessities of its surroundings, which thus, it may be supposed, caused the production of the larva which by and by took the form of a painter's easel, and then developed a bud which assumed the adult outline, and settled on the bottom. In the same way it is not easy to see what advantage the common Cross-fish could have gained

by the addition of its remarkable type (*Bipinnaria*) to its development. A pelagic larva developing directly—for aught that we know—would apparently have been equally efficacious in peopling the waters with its countless swarms. Yet it cannot be denied that these peculiar larvæ are characteristic of forms which occur in enormous numbers in the sea, as, for instance, the Sand-stars, Brittle-stars, and the common Cross-fishes.

Amongst the Worms, budding is remarkably prevalent in various groups. Even in the parasitic forms such as the Cestodes it is exemplified in the scolices of *Tænia cænurus* forming *Cænurus crebralis* in the Sheep, the daughter-scolices, each with its armed head, budding from the interior of the parent-cyst. Another example is the well-known *Tænia echinococcus* forming hydatids in man by the development in the liver and lungs of numerous daughter-vesicles, even to two generations. The advantages of budding in perpetuating the species are sufficiently illustrated in the former case. Thus, if no bud were formed on the interior of the cyst, the death of the Sheep would be that of the *Cænurus* also, but the presence of numerous buds suffices to spread them broadcast amongst the Dogs that eat the head of the Sheep. Thus the vicious circle is kept up, for the scolices become tapeworms in the Dogs, and their eggs are by and by introduced with food into the body of the living Sheep.

The soft ciliated worms called Turbellarians show great capacity for regenerating mutilated parts, while in some of the elongated forms the fragments become perfect animals, as in the Nemertean termed *Lineus sanguineus*, Jens Rathke, each fragment of which develops a head with brain, sense-organs, and other parts in a comparatively short time. Besides this power of regeneration, certain forms present a similar condition to the Echinoderms, in so far as the larval Nemertean is budded from the *Pilidium*. As many of the Nemerteans are littoral and confined to the bottom, such a method of increase would tend to carry them to distant sites, since during the growth of the *Pilidium* and thereafter during the development of the Nemertean bud a considerable space may have been traversed. Yet such forms would be exposed to the attacks of predatory crustaceans and other animals even more than the young of types like *Lineus obscurus*, which attain some size before leaving their protective capsules.

It is in the lower Turbellarians, however, that linear budding is conspicuous—for example, in *Microstoma* and *Stenostoma*—in which a chain is formed behind the adult. So little is known of the life-history of these forms that it is difficult to determine the advantages of linear budding in contrast with the young produced from eggs in the ordinary manner.

Linear budding likewise occurs in the Oligochætous division of the bristled Annelids, as in *Stylaria* and *Chaetogaster*. In *Stylaria lacustris*, O. F. Müller originally described two kinds of budding, *viz.* (1) That in which the last segment sprouted into a number of body-rings which ultimately constitute a new individual. This last segment gives origin to other buds, the hindmost being the oldest, and the anterior the youngest, as well as the smallest. After these buds have been thrown off the segment next in front takes on a similar function, and is able to reproduce buds. (2) When the body has attained the length of forty segments, suddenly a division begins in the middle, so that two bodies each of twenty segments are formed. Budding in the same species was next alluded to by Gruithuisen* in his account of its anatomy. Oscar Schmidt,† again, thought that the development of the bud in *Stylaria* took place after the manner of an embryo and its nurse. Max Schultze,‡ further, described a softening of two body-rings which develop an opaque cellular substance filling the segment symmetrically, and a new body-segment forms, and so on until a number of body- and tail-rings, as well as a head-segment anteriorly, are developed out of the end-segment. Then a new bud is formed in front, and again another, so that a series of three individuals, each with head, eyes, proboscis, and body-segments, is present. These are now detached, and the process is repeated. When, however, by these means the body of the parent-stock has been reduced to twelve or fourteen rings, a pause ensues. After forty or fifty segments have been developed by increase at the posterior end a new cycle commences, for the animal divides into two, as O. F. Müller described. The latter author thought that the separation took place between two segments, but Max Schultze

* 'Nova Acta Acad. Cæs. Leop.' Bd. xi. 1, pp. 243-248, 1823.

† 'Handbuch der vergl. Anat.' p. 293.

‡ 'Archiv f. Naturges.' 1849, pp. 293-304.

was of opinion that it occurred in the middle of a segment. He never found traces of eggs or other elements. Such, however, have been described by D'Udekem,* Claparède, and others in this species, and in *Æolosoma* and *Chætogaster*. The former author, indeed, found these elements mature, yet the example continued to reproduce by buds.† Moreover, in one bud these elements (male) were present. Vejdovsky,‡ in describing the linear budding of *Æolosoma*, points out that the bud arises irrespective of the presence of a special segment or zone. A slight thickening, the earliest indication of the ganglia, appears in a segment, a pair of short side-nerves following by and by, the alimentary canal and the ventral vessel being continuous with those of the parent. Then a pair of lateral branches arise from the vessel, two ciliated pits form, a pharynx is developed, and the bud is more or less complete.

In the same group of Worms (Oligochæta), *Lumbriculus*, though it does not present buds, has a remarkable facility for breaking in pieces in summer and autumn, each piece becoming an independent animal; while the eggs and other elements appear to be developed only in winter. A tendency to forking in Earthworms has also been described by Dr. Williamson and others.

On the whole, it is doubtful what advantage buds afford these Oligochæts. If no increase by eggs took place the case would be more simple, but such are found in the parent-stock, as well as in certain buds (*Stylaria* and *Æolosoma*). In some it would appear to be an accessory mode of increase, since it occurs at a different season from the ordinary method by eggs,§ and perhaps such conditions may be connected with the abundance or scarcity of food, or with the drying up of the waters which they frequent. As in the Polychæts, all the forms which show buds are small.

* 'Bullet. l'Acad. Roy. de Belgique,' 30 an. 2me sér. xii. p. 243, 1861.

† In the Naides budding is common at all seasons, reproduction occurring only at intervals.

‡ *Op. cit.* p. 161, Taf. 1, figs. 16, 29, &c.

§ Ray Lankester found that the sexual individuals (hermaphrodite) of *Chætogaster* on pond-snails ceased to show buds. They were larger than the fissiparous forms, and had an increased number of bristles.

In the group of Polychæts budding attains even greater prominence than in the foregoing, yet out of the thirty-seven families comprising the order it occurs only in two, *viz.* the Syllidæ and the Serpulidæ, and, as mentioned, the species are small.*

Since the days of O. F. Müller the formation of linear buds has been known in *Autolytus prolifer* (his *Nereis prolifera*), the Danish author having noticed a chain of three individuals, the youngest the most anterior, and observed that those which separated from their parent were filled with eggs. In the family of the *Syllidæ*, to which this species belongs, the most remarkable examples of budding occur. These have been described by many authors, some of whom, as, for instance, De Quatrefages, have termed the process one of alternation of generations. In essential particulars this consists in these Annelids of the budding from a nurse-stock of male and female buds, each differing from the other in external form. A series of gradations, indeed, may be observed from the condition in *Haplosyllis*, in which the posterior end is thrown off after the eggs or other elements in it are matured, to that in *Autolytus prolifer* and *Myrianida*, in which one or more buds, either male or female, form a chain at the posterior end of the nurse-stock.

In *Myrianida* the bud takes its origin in the segment (called by Malaquin† the formative zone) in front of the tail (pygidium). It is considerably narrower than the adult, and that next the latter is the youngest, several segments without feet, however, being in front of it. While pigment-touches are present in the youngest, there is no head, and thus Malaquin considers that the anterior extremity is subsequently formed, or, as he terms it, is a new stolon. Proceeding backward, the number of segments in the buds increases, and the parts attain greater complexity. Little thickenings—after the head is formed—indicate the tentacles, the median cylindrical, the lateral somewhat flattened. In the male the latter is a compound structure, according to Malaquin, the result of the fusion of the lateral (anterior) tentacles and the palpus, the outer limb of the bifid organ corresponding to the former, the inner to the latter. In

* Eyes have been found in a segment of *Eulalia* by Verrill.

† 'Recherches sur les Syllidiens,' Lille, 1893.

the female the organs appear in the same position, but the anterior lateral tentacle remains as the median—all being flattened, a fact which M. Malaquin considers is corroborative of his interpretation of the homologies of the bifid organ in the male. In the advanced free male bud (*Polybostrichus*, Müller) a short pair of lateral posterior tentacles occur in front of the dorsal eyes. Cylindrical tentacular cirri (dorsal and ventral) are present in the post-cephalic segment, whereas in the female only a single foliaceous one exists. The dorsal and ventral eyes appear as mere pigment-touches, and gradually attain greater complexity. The structure of the feet in the buds of different sexes in the main corresponds, the best developed organs being anterior, the most rudimentary posterior—that is, the most recently formed segments (from the formative zone) possess imperfectly developed feet. In the fully formed foot the flattened cirrus occurs dorsally, then follow the long swimming bristles, while the ventral division has bristles with short bifid tips differentiated from the shaft. In the males the first four segments are devoid of bristles, and in these the special elements are developed. In the females the natatory bristles commence on the first bristled segment, though occasionally they vary.

By and by the best developed buds, which show by their vigorous motions their independence, break off posteriorly, and swim freely in the water, the males—consisting of about thirty setigerous segments—being known to zoologists (before Alex. Agassiz cleared up the subject) under the name *Polybostrichus*, and the females—of about thirty-five segments in all—under the name *Sacconereis*. In the latter a pouch, occupying fifteen or sixteen segments of the median ventral region, is formed by a secretion from the epidermal glands, and in this the eggs are carried until they are developed into larvæ.

In *Autolytus Edwardsii*, De St. Joseph, several varieties of budding occur. Thus Malaquin found a cephalic thickening between the fortieth and forty-fifth segments, such thickening occurring therefore in an old segment and not in a new.* In front of the developing head is a zone of proliferation pertaining to the nurse-stock. After the formation of the head (which is

* In others between the twenty-fifth and twenty-eighth segments.

accomplished quickly) the eggs or other elements rapidly augment in bulk, the natatory bristles develop, the bud soon arrives at a certain degree of maturity, evinces energetic movements, breaks off, and swims freely. The nurse-stock then shows regeneration posteriorly.

In other cases, before the bud is detached, the proliferating zone in front of the tail (pygidium) of the nurse-stock gives rise to new segments, which considerably increase the length, so that on separation of the bud it is ready to proceed with a new bud posteriorly.

In a third form the head of the bud is found as before at the forty-first setigerous segment. Thereafter two indifferent segments (formative zone) in front of the head are formed, and a new bud is developed. The posterior bud, as in the previous cases, is formed out of certain of the older segments of the nurse-stock, and is thus more or less scissiparous in origin.

Again, a nurse-stock of forty or forty-two segments* is followed by a chain of buds (generally male, more rarely female), all formed at once by active proliferation. The terminal bud soon becomes free. Another of forty segments, with ovaries from the twenty-fifth to the fortieth (fifteen), then several young segments (four) with cirri and minute bristles, a formative zone, and a tail (pygidium). It becomes a female bud, with its head at the forty-first segment.

As a rule in examining such forms, Malaquin is of opinion that if the segments of the bud are of the same or larger diameter than those of the nurse-stock, then it is probably a case of fission; whereas in budding the segments have a smaller diameter than those of the parent or nurse-stock. In certain Syllidians, again—for example, *Autolytus longiferiens* and *Exogone gemmifera*—both direct development (epigamy) and budding (schizogamy) are present.

De Saint Joseph† thinks that, when the bud in *Autolytus* has considerable length, and consists of three regions, it is probably the result of fission. On the other hand, if short and of two regions, it is probably due to budding. While *Myriavida* has a

* In others the nurse-stock in front of the buds has only twenty-eight setigerous segments.

† 'Ann. des Sc. Nat.' 1886, p. 256.

chain of buds, *Virchowia* and *Procerastea* have only a single bud.

Pagenstecher* thought he observed lateral budding in *Exogone gemmifera*, but, as pointed out long before by Ærsted,† this is simply a case of gestation. Vaillant,‡ again, considered he had discovered a series of buds in an Annelid apparently belonging to the *Terebellidæ*, but, as shown in 1868,§ this was due to a misapprehension; and Ehlers, of Göttingen, agreed. The only noteworthy case of lateral budding is that of *Syllis ramosa*|| of the 'Challenger,' though perhaps it is foreshadowed by the monstrosity subsequently mentioned by Langerhans¶ in *Syllis variegata*, and by the bifid tails described by Andrews in *Proceræa tardigrada*.** More recently H. Parlin Johnson†† has given an account of the curious *Trypanosyllis gemmipara* from Puget Sound, in which a dense cluster of buds (about fifty) spring from "proliferating somite or somites" near the posterior extremity of the Syllid. They are attached by a short unsegmented pedicle. The remarkably branched *Syllis ramosa* was procured by the 'Challenger' on muddy ground in the Flores Sea, and also off Zebu—one of the Philippines—in a cup-shaped silicious sponge. It was situated above the wisp, and sent branches into the various canals of the sponge. No head occurred in any part from Zebu, but one head was found in that from the Flores Sea. No pharynx and no proventriculus was present. The free ends of the animal in many cases had a more or less finished appearance, as if sea-water carried in food to the moniliform alimentary canal. In others the ends presented developing buds. The body of the animal, indeed, has a furor for budding—laterally, terminally, and wherever a convenient point occurs. The young buds remain slender till they have reached considerable length, and into each a diverticulum of the alimentary canal of the parent enters. On attaining a certain size they give off other

* 'Zeitsch. f. w. Zool.' 1862, Bd. xii. p. 267.

† 'Archiv f. Naturges.' i. p. 20, 1845.

‡ 'Ann. des Sc. Nat.' 1865.

§ 'Trans. Roy. Soc. Edin.' xxv. p. 309.

|| 'Annelids of the Challenger,' p. 198, plate xxxi., &c., 1885.

¶ 'Nova Acta der K. Leop.-Car. Akad.' Bd. xlii. p. 102.

** 'American Naturalist,' 1892.

†† 'American Naturalist,' vol. xxxvi. p. 295, April, 1902.

buds, until the whole has a remarkably branched condition. The tail of the bud is early formed, and is soon furnished with two long cirri; indeed, it would seem to be more important than a head.

The currents through the sponge probably bring this curious Annelid its food, and carry out the free-swimming buds containing the eggs. It might be supposed by some that injuries from the sharp spicules of the sponge are connected with the tendency to form branches and buds, but recent experiments by Andrews in other forms show that incisions and similar lesions do not give rise to such growths. One example is thus fitted to take advantage of most of the facilities for accommodation offered by a single sponge, and many would say that the animal had been modified to suit its surroundings; yet other *Syllidæ* living in sponges are not thus affected.

A well-marked instance of linear budding (scissiparity) occurs in *Filigrana implexa*, one of the Serpulids, as described by Sars and Huxley. This little Annelid constructs masses of slender calcareous tubes resembling coral. The segments of the parent behind the sixteenth are budded off to form a separate animal, but the head and thorax are new formations. The eggs and other elements occur in the parent-stock, so that the buds contain neither eggs nor other elements as in *Myrianida* and *Autolytus*, though they afterwards acquire them.

The facility in budding which is possessed by the small Annelids just described is a remarkable feature, since in the Nereids the epitokous or epigamous condition alone occurs. The adults of the latter undergo a kind of metamorphosis, so that with the change in the form of the feet and the development of long swimming-bristles they are enabled to assume a pelagic life, and thus distribute widely the eggs and other elements. Yet it would not appear to be absolutely necessary for such forms to undergo this change in the feet, and acquire the provision of the swimming-bristles, since the well-known Palolo of the South Sea Islands—without any alteration in the shape of its feet—leaves its abode amongst rocks and corals and swims freely in the water. The rarity of the heads of this species amongst the pelagic forms indicates that the posterior region containing the eggs and other elements is thrown off to lead a brief existence amongst the inshore water.

The advantages of budding in these small Polychæts, such as *Autolytus*, appear to be the wide diffusion of the species, since the buds of both sexes and the females bearing the ovisacs are extremely active swimmers, and thus before the larvæ are ready for a free life they have been borne great distances. In our country it is in the colder months of the year, viz. from February to April, that they most abound in the ocean, a period less prolific in the larvæ of the Polychæts generally than the warmer months, though mature adults are not uncommon. What are the reasons which, with few exceptions, confine this mode of increase to the family of the *Syllidæ*? The question is difficult to answer. It is true the parent- or nurse-stocks are more or less sedentary, but they share this habit in common with many others which have only the ordinary method of increase, or which throw off only the posterior end with the eggs. The *Syllidæ*, however, are forms almost universally distributed, and in considerable abundance, from the Arctic to the Antarctic Ocean. The common species and its buds are often met with in the Arctic Seas, and the same remark applies to *Filigrana*. An interesting feature—specially dwelt on by Malaquin—is the gradual transition from forms with no further differentiation than the collection of the eggs and other elements in the posterior part of the body—which has swimming-bristles—to those in which this region presents several more or less mature and individualised buds. Nature thus truly does not advance by leaps. Moreover, while some of the family produce young directly from eggs, others increase only by buds. On the whole, it would seem that such Annelids have an organization so plastic as to render budding easy, and that in such forms as *Autolytus* and *Myrianida* it has been found highly advantageous in the struggle for existence. After all, there is nothing more wonderful in the soft tissues of a segment developing eyes, sense-organs, and other parts than their formation in the egg itself.

When we come to the Polyzoa, budding is everywhere a general feature, from the few in *Loxosoma*, which separate from the parent, to the arborescent polyzoaria of the marine and fresh-water Polyzoa, in both of which the new buds remain in connection with the old, and constitute complete colonies. In

Loxosoma, which is frequently an ecto-parasite of Annelids and Gephyreans, the buds of the larvæ arise as a surface-thickening (ectodermic), growing inwards to form the lophophore (Harmer), and in all probability a process of the stomach (hypoblast cells) goes to form the larval digestive system. *Loxosoma* at a given moment is unisexual, some having small, others large, eggs. In *Pedicellina* the buds spring from a creeping stolon. By means of ciliated young, which are produced from eggs, the range of the species is greatly extended. An analogous arrangement occurs in the creeping stem of *Rhabdopleura*, from which the polypides come off at various angles, and which has a remarkable tendency to form buds. The ova of this form are unknown, though Ray Lankester found the testes in the abdomen.

Still more striking is the condition in *Cephalodiscus* (a Diplochordate of Masterman), one of the most interesting discoveries of the 'Challenger,' for, in addition to its few though large eggs,* it has a furor for budding from the tip of the pedicle, the majority presenting from one to three or more buds at various stages. These buds are first observed as little processes projecting from the hypoderm, and in their earlier stages at least seem to have a channel of communication with the body-cavity of the adult. Moreover, the cavities characteristic of the latter are soon differentiated, viz. the cavity of the shield, the two collar-spaces, and the body-cavity divided by the mesenteries (dorsal and ventral). The small club-shaped bud soon develops a shield, which is proportionally large, with papillæ as rudiments of the plumes. The pedicle is short, and has a sucker-like hypodermic projection, and, since a peculiar curvature of the body takes place, the tip of the pedicle scarcely projects beyond the margin of the disc. Shortly after the symmetrical filaments on each side of the plumes are visible (though quite small), the bud separates from the adult, and as soon as—and sometimes even before—it is detached, a little bud appears near the tip of its pedicle. Thus the increase of the species by budding alone is very considerable, even comparatively young forms giving rise to a succession of buds.

The general form of the Polyzoa would lead us at first sight

* As in *Artisca*, in which they produce embryos about a third the size of the adult.

to expect increase by budding, since they approach in outline the hydroid zoophytes. *Loxosoma*, again, bears a superficial resemblance to the solitary forms such as Hydra, and, like the latter, it produces a few buds. The advantages of retaining a hold on a suitable site and extending the polyparium into an arborescent tuft, or a series of upright stalks, are in most cases obvious. The budding in such as *Cephalodiscus* takes place with rapidity, so that the new forms are soon ready to aid in the extension of the general home (polyparium), which is the joint secretion of the colony. The small number and large size of the eggs evidently point to a peculiar larval stage, and are probably also in relation with the feature just mentioned.

In the simple Ascidians, increase by budding takes place in the *Clavelinidæ* so as to form small colonies, in which each ascidiozoid, according to Herdman, has a distinct test, but all are connected by a common blood-system. The buds are formed on a stolon—as vascular outgrowths of the three layers from the posterior end of the body.

The compound Ascidians, again, increase by budding, so as to form colonies, in which the animals are buried in a common investing mass, and have no separate tests.

The *Salpæ* were formerly considered to be remarkable examples of budding, in which the aggregate forms were developed from the solitary in the region of the endostyle near the heart; but Brooks has shown that the germinal mass is present in the embryo of the solitary form, and extends into the stolon as the latter grows out. It consists of investing epithelium and ova, the latter forming a single row in the mature stolon, and in the course of constriction to form the chain of buds (*salpæ*) each gets, as a rule, a single egg, with its epithelial coat, which is differentiated into special organ (testis), follicle, and duct,* the latter attaching the egg to the dorsal wall of the chain-salpa. The solitary form thus does not arise from the chain-salpa, but from an egg passed into the chain-salpa from the preceding generation of the solitary form.

No budding occurs in the Articulates (*e. g.* Crustacea, Myriapoda, Arachnida, and Insecta), nor in the Mollusca or higher forms.

* Through which fertilization takes place.

In taking a general survey, therefore, of budding in animals, it is apparent that it reaches a high degree of frequency in certain lower groups characterized by a more plastic nature—for example, the Protozoa, the Sponges, the Cœlenterates, the Polyzoa, and compound Ascidiæ and the *Salpida*; while it occurs less frequently in the Cestode Worms, in the lower Turbellarians, in the bristled Annelids, and in the simple Ascidiæ. Moreover, it is apparent that its place is taken by parthenogenesis in such groups as the Crustaceans, Insects, and Rotifers. It comes therefore to be a question whether any common feature in regard to this mode of increase links together all the divergent groups just indicated, and whether any basis exists for making reliable deductions as to its origin.

So far as can at present be ascertained, comparatively few zoologists have touched on these questions. Weismann, it is true, tracing the division of labour and greater and greater complexity of organization, observes:—"Hence the single group would come to be divided into two groups of cells, which may be called somatic and reproductive. . . . Amongst the lowest Metazoa, such as polyps, the capacity for reproduction still exists to such a degree in the somatic cells that a small number of them are able to give rise to a new organism—in fact, new individuals are normally produced by means of so-called buds." The same author assumes that the entire absence of development by means of eggs "is to be primarily explained as an adaptation, and that the alternation between sexual and asexual multiplication met with in Hydromedusæ, Cestodes, and others has arisen from the demands made by the conditions of life—demands similar to those which have determined the alternations between monosexual and bisexual generation found in Insects, Crustaceans, and others. In both classes ordinary reproduction has been restricted to certain generations because it was not necessary in all of them, and because such restriction was a great advantage. The means by which this limitation is exercised are different in the two classes, not by any means because parthenogenesis could not have been introduced among the lower Metazoa, but because nature did not require it, but resorted to the far more practicable and flexible methods of fission and budding."*

* Weismann, ii. p. 221.

Darwin and his followers would assert that none of these animals were created for budding, but that the habit had been slowly acquired and perpetuated, from the advantages it gave its possessors over other forms which only increased by eggs in the ordinary manner, and thus perhaps leading to the supplanting of the latter by the former. The varieties which budded most freely, moreover, would have the best chance to survive.

On the other hand, budding gives no vantage-ground for sexual selection. Even in those cases in which the buds are of separate sexes, as in *Myrianida*, sexual selection would appear to be of comparatively little moment in regard to the issue of the respective elements in the free condition, except in so far as the strongest swimmers of both sexes might pass to the greatest distances from their parent-stock, and thus give rise to a hardier race. This end, however, might have been attained without the production of separate buds, as in those Syllides in which the posterior region discharges, for instance, its eggs without being separated from the anterior. The same occurs in the Heteronereis condition of the Nereids, and in *Dodecaceria*. It may be supposed, however, that the free buds, unimpeded by the anterior region, and with their specially organized swimming-bristles and processes, would be better fitted for dispersing themselves through the water, and intermingling with those from diverse stocks, just as the wind or an insect does in the case of many flowers and shrubs.

Again, many of the Syllides are sedentary, and the buds may be supposed to be a special means of dispersion, yet *Myrianida*, with its long chain of buds, is at least sometimes pelagic, and the buds of *Cephalodiscus* would not appear to subserve this end, which probably is the function of the larvæ from the large eggs of this species.

Nature appears in some cases to expend her energies in budding, and the ordinary sexual elements are not developed; yet in the animal of the coral-like *Filigrana* the latter exist in the parent-stock in front of the bud. Further, budding is a simple method of increase, since only a single form is necessary for this function, and the bud is not only fed and protected by the adult, but—in the case of those which subsequently lead

a free existence—it is brought on the stage in an advanced condition.

In regard to the origin of budding, it may have been inherent in certain of the lower types, and in such as the Annelids may have sprung from the tendency to fork, not infrequently met with; but our knowledge is yet too scanty to warrant conclusions. All that can be said is that a form which, under certain circumstances, increased by buds as well as by eggs had in all probability a better chance of survival than one which developed from eggs only. Further, that budding is remarkably adapted for the habits of many of the types mentioned, such as Zoophytes, Cestodes, Annelids, and Polyzoa.

NOTES ON THE SEAL AND WHALE FISHERY
IN 1904.

BY THOMAS SOUTHWELL, F.Z.S.

THE sealing fleet from Newfoundland, in the season of 1904, consisted of twenty-one steamers, a reduction of one, the changes consisting of the withdrawal of the 'Neptune,' 'Harlaw,' 'Terra Nova,' and 'Windward,' and the addition of the 'Bloodhound,' 'Viking,' and 'Eagle.' The 'Terra Nova' was sent out by the Government with the 'Morning,' as a sister relief ship to the Antarctic exploring vessel 'Discovery,' and the 'Windward' was purchased by Messrs. R. Ferguson & Co., of Dundee, to replace the 'Vega,' wrecked in Davis Strait last season.

The vessels left port as usual on the morning of March 10th, the St. John's fleet experiencing some difficulty at first from the ice, which was close packed on the shore; but the more powerful steamers giving a lead to the others, and the floe having slackened somewhat before a westerly breeze, they soon got clear away.

The first to arrive in port from the eastern fishery was the 'Aurora,' which sailed from Westleyville (Bonavista Bay), and was absent only sixteen days, having not only made the quickest but the most successful voyage of the season, her catch consisting of 34,849, only 189 of which were old Harps. Her captain reports that the ice was met with almost at once, the first "Whitecoat" seen on the 11th, and the breeding patch sighted on the 12th, about seventy miles N.E. of Fogo; he estimated the young Seals in this locality at not less than 100,000, and, at once setting to work, he had 4000 pelts on the ice before dusk. This went on day after day, impeded only by stormy weather, the vessel drifting south till she was only six miles outside the Funks; finally, with some little difficulty and delay, she got clear of the ice, and had a good run home. The weather proved very severe; every day a blizzard was experienced, which sometimes lasted for hours. Several other vessels

were in amongst the Seals at the same time, and by April 2nd five had arrived in port well-fished; the 'Walrus,' a vessel of 276 tons, manned by a crew of 120, having 16,720 pelts. In consequence of the heaviness of the ice and the intensity of the frost the more powerful of the ships fared best; the 'Kite,' a small vessel of 190 tons, with a crew of 89 men, was quite unable to contend with her surroundings, and only secured 733 Seals. The great bulk of the young Seals, being killed very early in the season, were rather immature, but those taken later on were in better condition. Very few old Seals of either species were obtained, and very few young Hoods, the 'Diana' alone being fortunate enough to secure about 7000 of the latter; these were obtained well out to sea south-east of the Harps. As these are usually found outside of the Harps, and well to the north-east of them, Sir Robert Thorburn informs me it is supposed, and probably correctly so, that a section of the Harps and most of the Hoods passed away south, thus escaping. It seems likely that most of the Gulf Seals also, as will be seen, escaped.

The reports from the Gulf sealers are very unfavourable, owing to the immense sheets of unbroken ice which prevented the vessels from reaching the young Seals.

The commander of the 'Viking' states that it was the worst year in his experience, and that his vessel was unable to reach the Bird Rocks; her 4394 Seals were taken coming out of the Gulf. The 'Nimrod' reports to the same effect; it was found impossible to get into the Gulf, and her 5000 young Harps were taken in the neighbourhood of St. Paul's before the end of March, after which time only some two or three hundred Seals were killed. She arrived in port on May 2nd.

An unsuitable iron boat from Nova Scotia was wrecked in the Gulf, and the crew taken off the Magdalen Islands by the 'Aurora,' which was sent out for that purpose.

The average take of the twenty-one vessels was 13,546, eight of them having above that number, and thirteen below it; eight vessels had more than 16,000 each, four others between 10,000 and 13,000, and nine under 10,000. The 'Aurora' again this season headed the list with 34,849, of which only 185 were old Harp Seals, very few of which, as already stated, were killed by any of the vessels, and the bulk of those late in the season. The

'Kite,' for reasons already explained, captured only 733 Seals. The total catch of the steamers was 284,473, valued at £80,758, against 317,760, valued at £89,958, in the previous season. To these must be added the Seals taken from the shore, and those secured by the schooners.

In consequence of the readiness with which the breeding Seals were found, the "Whitecoats" were very immature, and the Editor of the 'St. John's Evening Herald,' comparing the season of 1902—the year of the strike, when the vessels did not get away till the 12th, and the main body of the Seals was not found till the 18th—with that just past, points out that whereas the number of Seals taken in the former year was 10,000 less than in the past season, the weight of fat was almost 1000 tons more (6153 tons against 5186 tons), thus clearly showing the advantage of giving the Seals a few days' longer grace.* The growth of the Whitecoats under favourable circumstances is very rapid, but, in addition to the earlier killing, the past spring has, owing to the absence of snow and the severity of the frost, been very unfavourable to their development; the difference, however, in the money value in the two years has been lessened owing to the increase in the price of produce, which is now 4 dols. per cwt.

Hitherto the carcasses of the Seals have been left on the ice after the stripping off of their pelt and fat, but it was said that a whaling vessel, the 'St. Lawrence,' would this season be sent out to collect the carcasses, with a view to extracting the remaining oil, and the conversion of the flesh and bones into manure. How far this has been successful I am not aware.

As is usual, many "panned" Seals were lost owing to fog, or swept away before they could be got on board; the 'Erick' alone is said to have lost 86 "flags" of from 80 to 100 Seals each; she is reported to have killed and "panned" 30,000 Seals in ten days, from March 15th, but her final return is only 17,300. Similar losses were experienced by other vessels. It is therefore evident that vastly more young Seals were killed than were secured, and this wasteful method cannot fail to be regarded with regret.

* Cf. further remarks on this subject in my Notes for 1901 (Zool. 1902, February, pp. 44-45).

WHALES.

In glancing at the reports of the Whale-fishery in past years one cannot help contrasting them with those of the present time, and being struck with the changes which have taken place in the nature of the produce brought home from the Arctic Seas. Years ago the Black Whale was *par excellence* the object of the whaler's quest, supplemented only by such White Whales, Seals, and Walruses as could be conveniently secured without neglecting the main object of pursuit; but as these valuable animals grew scarcer, smaller game engaged their attention, and Seals bulked largely in the returns, being sought for on the west ice north of Jan Mayen in the months of March and April before the vessels went north in search of Whales off Spitzbergen. In time this sealing became unprofitable, and about the year 1880 the Bottlenose fishery came to the front, reaching its culminating point in 1883, when 535 of these Whales were killed by the Greenland vessels; the next year (1884) the number was 317, and after that date they fell off rapidly, this branch of the industry, like the Seal fishery, being abandoned to the Scandinavians, whose methods are more economical than ours, and who probably still find it profitable. Then the Right Whale failed in the Greenland Seas, where it had once been so abundant, and in the year 1894, for the first time since 1788, the port of Peterhead was unrepresented in this ancient industry; in 1901 even the Dundee vessels forsook these seas, and confined their operations to Davis Strait, where this is the only British port represented. But still other changes have crept in; stations have been established on the shore in likely quarters, and wintering parties left to collect produce by barter with the natives or otherwise, which is taken on board by the whalers or brought home by carriers; and, lastly, the waters of Hudson Strait and the adjoining channels have been invaded, so that the whaler's cargo is of a very miscellaneous character, reminding one more of a Hudson Bay Company's fur ship than of an old-fashioned whaler's, comprising even minerals such as mica and plumbago.

Five vessels from Dundee have been actually engaged in the Whale fishery in the past season, four in Davis Strait and one in Hudson Strait, in addition to which the 'Queen Bess' (72 tons) brought home produce from Hudson Strait, where she

has acted as a store-vessel at the mining settlement, and the 'Albert' (97 tons) still remains in Pond's Bay, her catch having been brought home by the 'Eclipse'; this consisted of 2 Right Whales, 19 White Whales, 3 Walrus, 686 Seals, 16 Bears, 10 tuns of oil, and 5 cwt. of bone.

The 'Active,' which, as usual, went to Hudson Strait, had a double duty to perform; she carried out stores and provisions for the fishing station at Lake Harbour, and to the mines in Repulse Bay, prosecuting the fishery as opportunity offered. She left Dundee on June 9th, and returned on Oct. 22nd. The captain found, on arrival at his destination, that the wintering party had captured one Whale, 8 ft. 9 in. bone, which was taken in Roes Welcome on Sept. 15th, 1903; and subsequently, on Aug. 14th, 1904, the crew killed a second Whale of 9 ft. 3 in. bone. The weather was most unpropitious, and the 'Active' bore up for home on Sept. 29th. I have mentioned the miscellaneous character of the cargoes brought home by the whalers, and as a further illustration give that of the 'Active,' which, in addition to the two Whales, consisted of 69 White Whales, 38 Walruses, 52 Seals, 32 Bears, 157 Fox and 30 Musk-Ox skins, besides 15 tons of mica, and a young Iceland Falcon.

The Davis Strait vessels experienced a constant succession of gales, fogs, and severe frosts—the ice, too, was very heavy—all of which greatly impeded the fishery. Plenty of Whales were seen, but the conditions were such that it was impossible to capture them; the winter, too, set in so early that the failure of the autumn fishery on the west side of the Strait also added to their vexation and disappointment, for there, too, Whales were seen in plenty, which it was beyond their power to pursue.

The 'Diana' was the most fortunate ship of the season, heading the list with three Whales, the first of which was captured on May 21st at the east-side fishery; it yielded 10 ft. 2 in. bone. Pursuing her way north, after some unpleasant experiences drifting in the pack, at the end of June, Dalrymple Rock was reached, where the crew laid in a stock of eggs and "ducks"; then on to Pond's Inlet, where, on July 7th, the second Whale, a fine fish of 11 ft. 1 in. bone, was killed; and ten days after, in the same locality, a third of 8 ft. 1 in. bone was secured. Other Whales were seen, and on Sept. 16th a fine

one was lost through the harpoon breaking ; but no other capture was made, and the 'Diana' returned with a successful cargo of 3 Whales, 23 White Whales, 30 Seals, and 26 Bears, yielding 36 tuns of oil and 45 cwt. of bone.

The report of the 'Eclipse' indicates the difficulties the vessels had to contend with, and, although no serious accidents occurred, the voyage was attended with much anxiety and hardship. When nearing Melville Bay the cold was intense, and the vessel had a hard struggle to fight her way through the ice, which constantly threatened to hold her fast in its pitiless embrace. Slowly she forced her way through till she reached the Bay proper, when the elements proved too strong, and whilst gallantly battling against fog, snow, and ice she was finally beset, and remained fast for twenty-five days. On reaching the Straits fishing-ground it was found that the old ice had not yet disappeared, and that it was being daily augmented by fresh formations, rendering the navigation both difficult and dangerous. Early in July several large Whales were seen, and one, a very fine fish of 12 ft. bone, captured. A few days later a second but much smaller Whale of only 4 or 5 ft. bone fell to her share, and these, with 53 White Whales, a few Seals, Walruses, and Bears, yielding 29 tuns of oil and 22 cwt. of bone, formed the whole of her cargo.

The 'Balæna' captured one fair-sized Whale of 10 tuns of oil and 15 cwt. of bone, and the 'Windward,' after several disappointments, killed a small fish of 7 ft. bone, yielding 8 tuns of oil and 5 cwt. of bone ; her ill-luck continued, for she subsequently fastened to a much larger Whale, which she lost through the line breaking. The crew killed 16 Bears.

The season therefore cannot be regarded as a successful one, the total return for the five whalers being 9 Whales, 104 tuns of oil, and 108 cwt. of bone, to which must be added the cargoes of the 'Queen Bess' and the 'Albert,' making in all 11 Right and 168 White Whales, 45 Walruses, 1135 Seals, 109 Bears, 211 Fox, and 30 Musk-Ox, with 114 tuns of oil and 113 cwt. of bone.

The present price of oil is £21 per tun, and that of whale-bone uncertain, no sales of importance having at present been effected ; £2500 per ton for size bone is being asked. The probable value of the season's produce would be about £16,250.

The American whalers have, I am informed, captured forty-nine Whales in the past season.

The whaling-grounds in the Greenland Seas have been deserted by our seamen, and, as the Norwegian sealers do not penetrate so far north, nothing is at present known as to the state of the ice in the latitudes formerly frequented by the whalers; but the 'Frithjof,' which took out coal for the relief of the "America" North Polar Expedition, twice failed in her attempts to reach Franz Josef Land.

The Finwhale fishery, which has been for some years successfully prosecuted by the Norwegians off the Finmarken coast, has recently been much extended. The first to follow their example was the Newfoundland Cabot Whale-fishing Company, to which I have more than once referred; stations were then established in Iceland, the Faroe Islands, and, in 1903, on the mainland of Shetland, where they were from the first successful.* In the season of 1903 only two stations were worked there, and 126 Whales killed; in 1904 two other stations were opened, and 412 Whales killed. An unlooked-for event was the capture of six or seven Sperm Whales in 1903, and of a large bull Sperm on June 24th, 1904.

The 'Shetland News' of March 12th, 1904, quoting from the 'Newfoundland Trade Review,' describes the success of this fishery from our oldest colony as phenomenal, and states that "whaling's stock is now considered the best investment in the country. Every fifty-mile coastal area (as provided by the law) is now taken up in Newfoundland, and there are also many areas taken up in Labrador. There are now ten whaling stations in operation, and there will be from three to five more next year [1904]. Near most of these there is stationed a Reis-Mullet reducing plant, in which, by proper scientific treatment, every particle of the fish that does not go into oil is reduced to some paying product."

The Finwhales of various species have hitherto been met with in surprising abundance, but how long the serious strain on their numbers, although spread over so extended a range, can be sustained it is impossible to say. The demand for this kind

* Cf. Whale-fishing from Scotland, 'Annals of Scottish Nat. Hist.' April, 1904, pp. 77-90.

of produce is limited, and the prices have of late been ruling so low that the industry seems to one who is only an onlooker in danger of being greatly overdone.

One excellent result, from a biological point of view, has arisen from this fishery. The facilities thus offered for the study of these animals under the most favourable conditions have enabled Prof. Collett and Mr. A. H. Cocks, in Norway, vastly to increase our knowledge of the Finwhales of this side the Atlantic; and Dr. F. W. True, of the United States National Museum, has done the same for those of the Western North Atlantic, proving, in a most exhaustive monograph of the group, that the Finwhales of the American waters are specifically identical with those of the European coasts, and that they occur in both regions in about the same proportions, with the exception of *Balenoptera borealis*, which seems scarce on the American side. The materials for Dr. True's study were derived chiefly from the Newfoundland whaling stations. It does not follow, I think, as I endeavoured to point out in a paper on the migrations of the Right Whale ('Nat. Sci.' June, 1898), that individual Whales roam throughout the vast region ascribed to each species; it may even be that the range of each race is comparatively limited, and that should it become extinct within that limit its place will know it no more, which one fears will be the case with the Right Whale of the Greenland Seas; that a wounded Finner might, in its flurry, rush across the Atlantic is certainly possible—indeed, there is one instance recorded in which such seems to have been the case—but most likely it would find itself amongst strangers in a "strange land." These remarks would equally apply to the Right Whale of the temperate seas of the northern hemisphere (*B. glacialis*).

The only species known to have a restricted and clearly defined range is found in the Pacific—the Californian Grey Whale (*Rhachianectes glaucus*), a very aberrant species.

Dr. True points out that the Finwhales of Newfoundland are smaller in all their proportions than those killed by the Norwegians. As an explanation of this fact, he offers the suggestion, but only as an alternative which he evidently does not adopt, that if the Whales on both sides the Atlantic mingle together—of which commingling there is practically no conclusive evidence

—the Norwegians, who had ten years' start of the Americans, might have killed off all the largest examples ; but this involves the supposition that the individual Whales frequented both sides of the Atlantic habitually and indiscriminately. In addition, there is no evidence that the Norwegian whalers selected the large Whales to the exclusion of the smaller, but they doubtless captured all the fish which "came into their net." The reasonable conclusion therefore seems to be, as above suggested, that the east and west sides of the Atlantic are each frequented by distinct races of the same species.

I must again tender my thanks to Mr. Robert Kinnes, of Dundee, and Sir Robert Thorburn, of St. John's, Newfoundland, for their valuable assistance ; also to the Editor of the 'St. John's Evening Herald,' for copies of his papers containing sealing news.

NOTES AND QUERIES.

MAMMALIA.

The Little Shrew in Aberdeenshire.—A specimen of *Sorex minutus* was found by Miss D. Hamilton at Skene House in October, 1904. She very kindly sent it to me for examination. This is the first record for our county. The creature would seem to be rare with us, for, although I have been giving special attention to the Shrews for some years back, it has not been my fortune to see a local example until now.—GEORGE SIM (Aberdeen).

Whale versus Swordfish and Thresher.—In your notice of Mr. Bullen's book, which appeared in 'The Zoologist' (1904, p. 438), the statement of the author that he is absolutely certain that he has seen the "Thresher" Shark "attacking the Whale at close quarters" reminds me of a most exciting struggle I saw (I think in 1874) while at anchor at St. Vincent, Cape de Verdes, on board the cable-ship laying the St. Vincent and Pernambuco cable. The Whale, in his frantic endeavours to escape from his two enemies, which assailed him simultaneously from above and below, repeatedly jumped clear of the water, amid a perfect cloud of spray and foam. While in the air we could plainly see the Swordfish hanging on to him, and while in the water the immense flail of the Thresher could be distinctly seen and heard. Such a sight as this only comes about once in a lifetime, and once seen can never be forgotten.—REG. B. LODGE (Enfield).

The Mammals of Great Britain and Ireland.—I am glad to see, in the last number of 'The Zoologist,' an appreciative notice of Mr. Millais's new work with the above title, concerning which there can be only one cause for regret, namely, that the high price of the work (eighteen guineas when complete) will place it beyond the reach of many to whom it would be extremely useful. My object, however, in writing is to correct a misapprehension in your notice (p. 464) which concerns myself. Your reviewer observes:—"We read that Mr. Harting also handed him [the author] over his notes which had been collected with the idea of a similar enterprise." I take exception to the words "handed over," which are not the words of the author. My collected observations and notes, which date from 1874 (when the last edition of

Bell's 'British Quadrupeds' appeared), and which now fill a dozen large pamphlet boxes, have not been "handed over" to anyone, but remain in my possession. In enabling my old friend Mr. Millais to refer to them whenever he pleased, I have been only too glad in this way to assist in the production of a work which should reflect more faithfully than any which has yet appeared the present state of our knowledge concerning the mammalian fauna of the British Islands. It would have been a churlish thing on my part to have neither utilized the collections myself, nor allowed others to do so, if so minded. But, while co-operating to this slight extent *pro bono publico*, I feel persuaded that a less expensive work on British Mammals in not more than two octavo volumes, and issued at a cost within reach of working naturalists, the majority of whom are not rich men, would be generally acceptable. For this reason I cherish the idea of producing such a work at no very distant date.—J. E. HARTING.

[The reviewer based his remarks on the following explicit statements in the preface to Mr. Millais's book:—"One man who is thoroughly conversant with the literature of the subject I had always expected to write a good book on British Mammals, but he has given his attention to other subjects, and when I last spoke to him he said he was as far off the project as ever. I allude to my old friend Mr. J. E. Harting." In a footnote it is stated:—"As this work goes to press, Mr. Harting has generously placed the whole of his valuable notes on British Mammals at my disposal." Any inaccuracy that may exist can therefore hardly be laid to the charge of the reviewer.—ED.]

AVES.

The Autumn Songs of the Willow-Wren (*Phylloscopus trochilus*) and the Chiffchaff (*P. rufus*).—In the writer's opinion these birds do not *resume* their songs in autumn, as a recent contributor to 'The Zoologist' seems to think. A few individuals of the above species sing all through the time they remain in Britain, but I have always noticed that as the time for their departure in autumn approaches their songs become more and more feeble. They do not in autumn, after a period of silence, burst into joyous song as so many birds do in late winter or early spring. The only British birds I know that seem actually to renew their full song in autumn after being silent in summer are the Robin (*Erithacus rubecula*) and the Starling (*Sturnus vulgaris*), and they both recommence singing early in August. All other species, *whose songs cease in summer*, except on rare occasions, do not renew them until the early months of the year. Of course, this is only my own

local experience, and may possibly be somewhat exceptional. — W. GYNGELL (Scarborough).

Pied Wagtail nesting in a Hedge. — On May 7th of last year (1904), whilst searching a low laurel-hedge at Richmond, Surrey, a Pied Wagtail (*Motacilla lugubris*) flew out a few yards in front of me, and I found its nest, containing five eggs, built in the fork of a laurel barely four feet from the ground. The site was just such an one as a Hedge-Sparrow or Linnet might have selected for its nest. The nest itself was built of roots, and lined with hair, but was not so substantially constructed as is usual with the Wagtail. It contained five eggs. I do not believe it was an adopted nest of Linnet or Greenfinch, but that it was a genuine nest of the Wagtail, although possibly hurriedly built through the bird having been disturbed from another nest when just ready to lay. The young, I believe, hatched off safely, and on June 19th I had another look to see if its second brood was being reared in the same nest, but found it was in too filthy and dilapidated a condition for further use, so looked around for it elsewhere. Noticing a grass-root on a holly-hedge about ten yards away, I followed it up, and found, as I expected, that it led to an old Blackbird's nest, in which was the newly-built Wagtail's nest containing five eggs. As it was in a private garden, I have no doubt that this brood also got safely away. Since the foregoing note was penned I notice that the Rev. F. C. Jourdain, in 'The Zoologist' (1904, p. 421), mentions several instances of the Pied Wagtail building in other birds' nests. I might therefore add that, besides the instance above mentioned, and the nest he refers to as having been found by me in 1902, I found a Pied Wagtail's nest, in 1894, built in a Thrush's nest, and containing six eggs, in the lower fork of an elm at Gunnersbury, about a mile from here.—ROBERT H. READ (Bedford Park, W.).

Birds building in other Birds' Nests.—The preceding note reminds me that, besides the Pied Wagtail, many birds build or lay their eggs in other birds' nests, some habitually, others only casually. The following are some instances which I have met with myself:—

Robin's nest built in Thrush's nest on ivied wall, containing four Robin's eggs and one of a Cuckoo. Hedge-Sparrow's nest built in Blackbird's nest in hedgerow. Spotted Flycatcher's nest, containing three eggs, built in Blackbird's nest in hawthorn-bush in hedgerow. Spotted Flycatcher's built in Mistle-Thrush's nest in apple-tree. Pied Flycatcher's, containing five eggs, built over a Marsh Tit's, with three eggs in hole in tree-stump. Greenfinch's, with one egg, in Blackbird's in thorn-bush. House-Sparrow in House-Martin's nest. House-

Sparrow's egg laid in Swift's nest ; the old Swift was sitting on this egg and one of its own. Starling's nest built in Green Woodpecker's hole. Jackdaw's eggs laid in Starling's nest in hole in elm-tree ; also in old Crow's nest. Cuckoo's eggs in various nests. Barn-Owl's eggs in nests of Stock-Dove, and in tame Pigeon's nest in a dovecote. Long-eared Owl's eggs in nests of Sparrow-Hawk and Wood-Pigeon ; young of ditto in Rook's nest, amongst several other Rooks' nests containing eggs. Sparrow-Hawk's nest built on Wood-Pigeon's nest. Honey-Buzzard's built on Squirrel's nest. Merlin's five eggs laid in a Raven's nest on a ledge of rock on a Scotch hillside. Kestrel's eggs in nests of Carrion-Crow, Magpie, Common Buzzard, &c. Pheasant's eggs laid in Partridge's nest ; also in Wild Duck's nest. Oystercatcher's egg in nest of Lesser Black-backed Gull. Green Sandpiper in nests of Squirrel and Song-Thrush.

Doubtless many readers of 'The Zoologist' could add considerably to this list. In addition to these many birds either repair their old nests, or build new ones on their own old nests of preceding years, such as the Rook, House-Martin, Eagles, Buzzards, Osprey, &c. On one occasion I found three nests of Robin, one over the other, the top one containing fresh eggs, and the middle one stale eggs of the preceding year. It may not be generally known that some of the *Limicola* have the same habit. Underneath the-nests of Peewit and Avocet, I have found old egg-shells and nesting material of previous nests, which in all probability were made the year before by the owners of the new nests. In one instance, in the hollow amongst the pebbles which did duty for a nest of Oystercatcher, were three fresh eggs laid amongst the bleached bones of another Oystercatcher, which must have been lying there at least a twelvemonth. Sometimes two birds of the same species will lay in the same nest. This is a not uncommon habit among game-birds, but I have found Song-Thrush with eight eggs, Starling with eight, Wood-Pigeon three, Tufted Duck twenty, Black-headed Gull five and six—in each case evidently the produce of two females.—ROBERT H. READ (Bedford Park, W.).

Hooded Crow at St. Albans.—I beg to record the shooting of a fine male Hooded Crow (*Corvus cornix*), early last October, by J. Last, the gamekeeper, on Oaklands, a small estate near here. The bird was observed feeding ravenously upon a Rabbit caught in a trap. It was shot at whilst so engaged, but flew into an adjacent tree. The keeper thereupon stalked the bird, and fired again, this time with success. It is rare indeed that one is enabled to get a second shot at these birds, and this particular bird must have been suffering from the pangs of

hunger to take up its station hard by the trap in the apparent expectation that the genus *Homo* would retreat, and permit itself to be shot at the second attempt. The bird—which is a very rare visitor here—has been beautifully set up by Mr. Spary, the local taxidermist.—W. PERCIVAL WESTELL (5, Glenferrie Road, St. Albans, Herts).

Late Breeding of Barn-Owl (*Strix flammea*).—I have this week (Dec. 4th, 1904) received for preservation an adult Barn-Owl and two young. The latter, though well able to fly, had a quantity of down still adhering to tips of the feathers.—CHARLES JEFFERYS (Tetbury, Gloucestershire).

Wood-Pigeons and Stock-Doves.—During the last eight years the former species have decreased in a wonderful way in this part of Notts, and I do not hesitate to say we have not one now where we had ten in the early nineties; but Stock-Doves have increased. Ten years ago I only remember two or three pairs nesting, and little flocks of sixes and sevens; now they nest wherever they can find a suitable place, and to-day (Jan. 3rd) I have seen in a field here a flock of between two and three hundred—I should be inclined to say nearer three than two. I have never seen such a flock before. The Grey Crow is decreasing in this part of the county; I have not seen more than twenty this winter, and I have seen one hundred in a day years back.—J. WHITAKER (Rainworth Lodge, Notts).

Waterhens nesting late in the Season.—On the ornamental waters of Weston Park, Sheffield, a brood of Waterhens (*Gallinula chloropus*) were hatched out during the last week of August, 1904. The nest was built on a clump of holly-branches, secured in the middle of a pond. It was most interesting to watch how, in the absence of the parents, one of the fully-fledged immature birds of an earlier brood would enter the nest and view, with tender curiosity, its baby brothers and sisters. Sometimes this bird would quit the nest before the return of one or both parents, but even when it remained on, its presence was never objected to. In fact, at one time I noted quite a large united family gathering, consisting of both parents, a fully-grown immature plumed bird, and a brood of nestlings, in the nest, with two other immature birds swimming round it. The nestlings were fed assiduously for some weeks by several members of the former brood, as well as by their parents.—C. J. PATTEN (University College, Sheffield).

Oystercatcher (*Hæmatopus ostralegus*) inland in Cheshire.—On a spit of sand at Budworth Mere, near Northwich, I saw an Oystercatcher, consorting with a flock of Black-headed Gulls, on Dec. 4th,

1904. This bird abounds on the sand-banks in the Dee and Mersey estuaries, but, so far as I know, it has not hitherto been noticed inland in Cheshire.—CHAS. OLDHAM (Knutsford).

Black-headed Gull (*Larus ridibundus*) assuming the Hood in Winter.—On Dec. 31st last I saw, on the Dee below this city, a Black-headed Gull with the brown hood almost entire. In the north this is, in my experience, an exceptionally early date for the assumption of the dark mask of the breeding plumage. The earliest date I have previously noted was Jan. 17th, 1903, and occasionally in February in former years. Instances in the south are apparently of more frequent occurrence; Messrs. D'Urban and Mathew, in their excellent work, the 'Birds of Devon,' quote several early dates for that county. Throughout the autumn and winter months this species is very abundant in this neighbourhood, but I consider the Common Gull (*Larus canus*) to be even more numerous. These last, with few exceptions, are always in adult plumage.—S. G. CUMMINGS (Chester).

Buffon's Skua (*Stercorarius parasiticus*) in Somerset.—The specimen of Buffon's Skua shot at Axbridge in October, 1903, to which Mr. Stanley Lewis refers in 'The Zoologist' (1904, p. 461), makes, as far as I know, the fourth example recorded as taken in Somerset. The first, an adult specimen, was shot at Nynhead, near Wellington, at the end of October, 1862 (*cf.* Zool. 1863, p. 8448). The second, in immature plumage, was shot near Stolford, Sept. 18th, 1873 (*cf.* Zool. 1874, p. 3869). Both these examples were examined by the late Cecil Smith. In October, 1891, numbers of these birds were driven by severe gales into the English and Bristol Channels, and one was shot at Clevedon (*cf.* D'Urban and Mathew, 'The Birds of Devon,' ed. ii. p. 397). I have also received other confirmation of the capture of this specimen.—F. L. BLATHWAYT (Lincoln).

Red-throated Diver (*Colymbus septentrionalis*) in Cheshire.—On Nov. 12th, 1904, I watched a Diver for some time on Tatton Mere, near Knutsford. It looked but little larger than the Great Crested Grebes, of which there were a number on the water, but even at a distance it might be readily recognized by the shorter and thicker neck and stouter, slightly recurved bill; its long, cigar-shaped body, too, lacked the curve above the water-line which a Grebe's has. In the dim afternoon light it was impossible with the binoculars to make out the white spots on the back which distinguish the Red-throated from the Black-throated Diver in winter plumage, but when I went again to the mere with Messrs. Coward and Cummings on the 19th, we could,

with a telescope, see the white edgings of the feathers quite plainly. This Diver has not been noticed previously on any of the Cheshire meres.—CHAS. OLDHAM (Knutsford).

Late Nesting of the Great Crested Grebe (*Podiceps cristatus*).—By the end of August most of the young Great Crested Grebes are independent of their parents, and it is unusual, on the Cheshire meres, to see the old birds feeding young ones in September. In 1904, however, two pairs of Grebes on Tatton Mere, near Knutsford, had unusually late broods—possibly their young had been destroyed, and they had laid again in late summer. Be that as it may, on Sept. 18th I saw a pair of Grebes in attendance on two downy young ones, and a third adult was feeding a single young one rather larger than the other two. I saw these three young ones being fed at intervals up to Oct. 15th, and on Nov. 6th the two smaller birds were still following their parents with querulous hunger cries. On the afternoon of Nov. 12th one of these young ones was still calling incessantly, and I saw it fed several times by one of the old birds.—CHAS. OLDHAM (Knutsford).

Some Old Welsh Bird Notes.—I have often wished that some of the writers who in the earlier part of the nineteenth century published tours in Wales had mentioned the birds they saw. But hardly any of them have done so. And when the other day I picked up a copy of the 'Journal of a Tour in North Wales,' by Arthur Aikin, published in 1797, which, according to the title-page, included observations in mineralogy and other branches of natural history, my hopes revived. But on turning over the pages I found that, although there was a good deal about geology, and something about plants, birds were only mentioned some half-dozen times. As, however, the tour was made as long ago as 1796, and the author had evidently had some training as a naturalist, these few bird-notes may be trusted, and will perhaps be interesting to the readers of 'The Zoologist.'

Speaking of the Berwyns, which he crossed from Llangynnog to Bala, the author writes:—"Kites, moor-buzzards, and other birds of prey here make their nests in security; and the long heath shelters the grouse, a race that would have been extinct here but for the wide range of these wild mountains, and which, notwithstanding their protection, is rapidly on the decline, owing principally to the improved state of the roads, which admit the carriage of game to greater distances than formerly." The range of high slate-rocks, worn into caverns and recesses by the dashing of the waves, to the north of Aberystwyth Castle, afforded at that time a secure abode for Hawks, Ravens, and various species of Gulls, and other sea-birds. On July

31st the author and his companions went from Aberystwyth to the Devil's Bridge. On the way they saw "a moor-buzzard [Marsh-Harrier] perched on a bush in the middle of a boggy field; it is a very voracious and destructive bird, and distinguished from the rest of the genus by its long slender legs." Midway down the glen of the Rhydiol "we saw several

'Kites that swim sublime,
In still repeated circles screaming loud,'

skirting, with an easy flight, the sides of the thickets in search of prey, or floating with almost motionless wings along the windings of the vale." Later, on a crag immediately above the union of the torrents of the Rhydiol and Funach [Mynach], they saw several Kites perched. The Kite was such a well-known bird in those days that there is no reason to suppose that the author, to some extent a trained naturalist, mistook Buzzards for Kites, although he never mentions the former. Indeed, the Kite was probably the commoner bird in this locality. On Snowdon Aikin saw three Ring-Ouzels amid the clouds on the summit, and the fact that he knew and recognized this bird makes one regret the more the paucity of his bird-notes. He writes that the Eagle was an occasional visitant to the loftiest crags, speaking apparently from hearsay, although he seems to have been there in the previous year also. On the Orme's Head multitudes of Gulls, Corvorants (*sic*), Ravens, and Rock-Pigeons are said to have taken up their abode, as well as the Peregrine Falcon. The abundance of the Kite and the mention of the Marsh-Harrier are the only points of especial interest in these few notes.—O. V. APLIN (Bloxham).

THE ZOOLOGICAL SOCIETY'S GARDENS.

DURING the winter months the additions to the Zoological Society's Menagerie usually fall below the average of those of the summer, both in number and importance. In December of last year they were not very numerous, but one or two are worthy of a passing notice. First and foremost may be placed a young male of the Greater Kudu, from Somaliland, presented by Major Irvine. There are now in the Gardens three examples of this species, which has many claims to rank as the most beautiful and graceful of all Mammalia.

The unrivalled collection of Bears, containing two or more examples of the Sloth, Polar, Malayan, Himalayan, Japanese, American Black, Grizzly, Brown, and Syrian, has been enriched by the presentation of a very fine three-year-old specimen of the Manchurian or Kamschatkan Bear, described from its alleged propensity for Salmon poaching as *Ursus piscator*. Judging from its form and general appearance, however, this specimen appears to represent merely a local race or subspecies of the Brown Bear (*U. arctos*), though distinguishable from examples of the European form of that animal by the profuseness of the hair-growth on the ears.

Examples of Insectivora, if we except the Common Hedgehog, are always rare in menageries. The Society may therefore be congratulated upon having received upon deposit three specimens of the Tenrec (*Centetes caudatus*), the giant of the order, and an inhabitant of Madagascar. Unfortunately the exclusively nocturnal habits of this animal render it an unsatisfactory object for exhibition from the visitors' point of view.

In the Monkey House may be seen two recently received examples of the West African Baboons, *Papio sphinx* and *P. anubis*; also a young specimen, from Northern Nigeria, of Pousargue's Guenon (*Cercopithecus pousargueti*), a species not previously exhibited in the Gardens, and two fine deposited representatives of the Lion Marmoset (*Midas rosalia*). Marmosets do not, as a rule, thrive in captivity, and have seldom lived long in the Gardens. The attempt, however, is now being made to keep them under glass as a protection against draught and a prevention against indiscriminate feeding by visitors. What measure of success, if any, will attend this experiment remains yet to be seen.

So far as Birds are concerned, the following call for special comment:— Two specimens of the Victoria Crowned Pigeon (*Goura victoria*), a handsomer bird than the commoner species, *G. coronata*, of which there was a pair in the Gardens last year; a Blue-necked Cassowary (*C. intensus*), from New Guinea, which adds one more to the exceptionally fine series of Cassowaries now on exhibit; and a Dabchick, or Little Grebe. The accession of the latter will give visitors to the Diving Birds' House at feeding-time an opportunity for comparing the different methods of subaquatic progression independently acquired by the Cormorants, the Grebes, and the Penguins. Some Divers, Guillemots, Razorbills, or Puffins would make a most welcome and interesting addition to the series, should a chance of procuring specimens of these species for the Society be afforded to any readers of 'The Zoologist.'

R. I. P.

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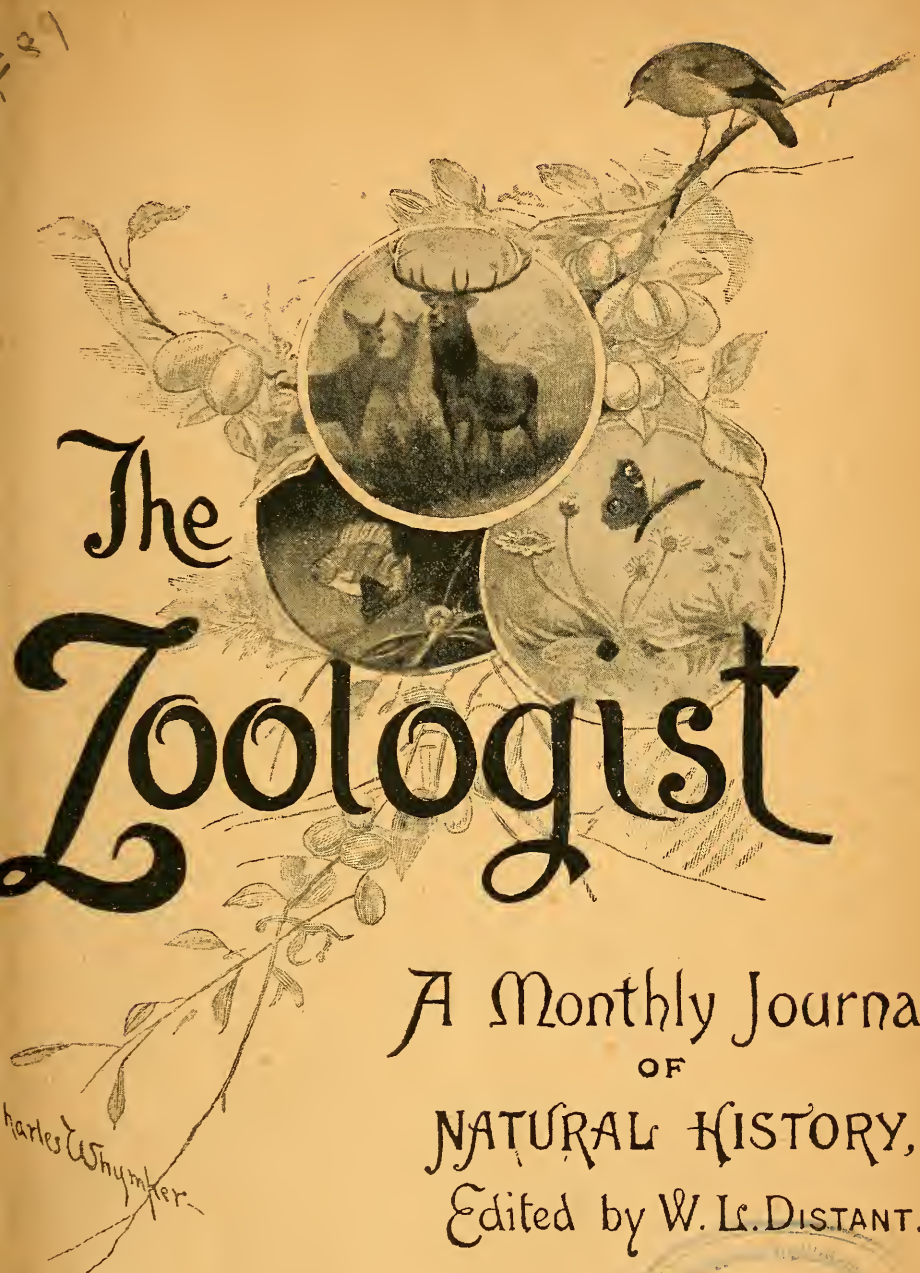
THE FLORA OF THE ISLAND OF JERSEY.

WITH

A LIST OF THE PLANTS OF THE CHANNEL ISLANDS
IN GENERAL, AND REMARKS UPON THEIR DISTRIBUTION AND
GEOGRAPHICAL AFFINITIES.

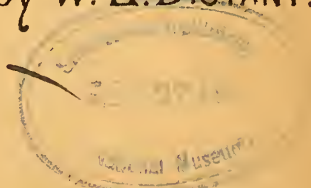
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THE ZOOLOGIST

No. 764.—February, 1905.

WINTER NOTES FROM LLEYN.

BY O. V. APLIN, F.L.S.

I SPENT a fortnight at the end of January and in the early part of February, 1903, at Pwllheli, devoting my whole time to walking and driving about the country looking for birds. With the exception of a few days, the weather was dull, heavy, and cloudy, with a leaden sky, and it was often very dark. This cloudy weather is, I am told, usual in winter. The day after I arrived was stormy from the S.W., with sunny intervals. It blew a gale at night, and at midnight the wind flew into the N.W., and the next morning all the distant Carnarvon mountains were white with snow low down their sides. There was even some snow on the Rivals, but it soon wasted. We had a clear cold day, sunny, with showers of hard snow. At night violent hail, which I thought would have smashed my windows, and heavy thunder and lightning. But this seemed to be the last effort of winter. The next day was delightfully sunny, and it was pleasant to lunch out of doors. As we got into February everyone seemed to anticipate nice weather, and to consider that mild spring days might be expected. Spells of hard weather do come to Llyn, but they are rare and exceptional, and it seemed evident that the degree of severity was never very great, nor the frosts of long duration. A fortnight's frost had been experienced about the New Year. More often than not during my stay it

blew hard from the sea at night, and it was from the S.W., when it was thick and misty at sea, that the heavy dull clouds came drifting in. But little rain fell—on the south coast, at all events—there being no high ground for the clouds to catch on; about Nevin and the Rivals, on the north coast, I believe much more rain falls.

On some days the grey sky was broken and dappled and streaked with blue for part of the day, and gleams of pale sunshine lighted up bits of the country for a few moments; but even then dark mists were brooding over the land, and clouds shrouded the hills. From Feb. 2nd to 12th the hills and carns were never clear, and I did not get a glimpse of the more distant mountains. A dark, misty, cloudy land in winter, this seems to be; the sea disposed to be grey and angry, and to roar at night without much provocation. Llanbedrog Head and St. Tudwal's islands, conspicuous objects in the summer view from Pwllheli, were often lost in thick sea-fog. I missed those brilliantly clear February evenings we know so well in Oxon, when the air seems absolutely transparent, and the paired Partridges are calling about the fallows. But on Feb. 12th the wind shifted to the N.W. in the forenoon, and we had a bright day, with the hills and carns all clear.

As I drove back from Nevin in the early dusk, the after-glow of a calm evening lighted up the gorse and the firs, reddened the bare woods, and touched the tawny bracken on the banks into the bit of necessary colour that the gorse, already putting forth blossoms, was not yet strong enough in bloom to supply. Even the whitewashed cottages had a rosy flush on their walls, similar to that which would soon be coming on the breasts of the Black-headed Gulls which followed up the spring ploughing so assiduously. Carn Madryn was finely cut against the glowing sky. I had been to see how the grand old Bird Rock looked in its winter aspect. It is a beautiful coast about Nevin, summer or winter; this afternoon the edges of the barren rocky hills were cut clear and hard, and the sea was bluish and bright-looking.

The Bird Rock looked very fine, and had a hardness of outline in this cold translucent atmosphere which one does not notice in the soft air of May. The greys and pinks of the rock,

the green of the herbage patches, and the yellow lichen-covered surfaces were all lighted up in the afternoon sunlight. But its windy ledges were deserted by their teeming summer population. A male Peregrine Falcon seemed like a caretaker left in possession, and remained flying about in front of the rock, crying "quayk, quayk, quayk," as if it were spring, and occasionally settling on a point of rock. Two or three Cormorants and Shags were flying over the sea down below, and these and a few Kittiwakes, one or two Herring-Gulls, and one adult Lesser Black-backed Gull were the only representatives of the swarming numbers of sea-birds which throng the rock in summer. A pair of Crows and some Rock-Pipits (a bird which is far less common in Lleyn in winter than in summer) were the only other birds I saw there. Cliffe, in 1851, mentions the Bird Rock as "tenanted in summer by countless sea-birds." It would be interesting to trace the published history of some of our great breeding stations of sea-fowl.

But notwithstanding the prevalence of mist and cloud there were one or two days when it was a delight to be alive, and in the open air—days of grey sky with dapples of blue, and a soft sweet air; when one breakfasted with the windows facing the sea wide open in an early morning temperature of 56°, mists and clouds wreathing round the carns and hills, but the sun overhead coming out warm. The soft air fragrant inland with starting grass, fir-woods, and dead bracken, or with heather and ferns. On Feb. 3rd, in the sheltered and beautifully planted grounds at Llanbedrog, a bush of tree-heath (*Erica lusitanica*), seven feet high, in full bloom, filled the air with a delicate woodruffy scent, not strong, but far-reaching; and there was a rhododendron-bush, a foot or more higher, with big white blossom-trusses fully out, as big as two fists. In this garden there are camellia-trees of ten and twelve to fifteen feet high, and some most perfect Irish junipers of great size, now all silvery with young shoots.

The aspect of the country denoted an extremely mild winter climate. At the end of January the grass-marshes near the sea were quite a fresh green, and, though the inland pastures were tinged with yellow, the gorse was already golden in sheltered spots, and generally showed some bloom even when growing on exposed banks. The bracken still kept the bright unsodden

brown of autumn, and the grass on the cliff-tops was almost as green as in May. On Feb. 10th *Potentilla Fragariastrum* was making a show on the banks with its white starry flowers, and the lambs were getting quite strong and big, having apparently been in the open all their lives.

Every day spring seemed to advance; yet it was not until the 13th (a most delicious morning) that, strolling over the morfa towards the Gimblet Rock for a few minutes before leaving for Anglesey, I heard Sky-Larks singing, and a Chaffinch, which succeeded in ringing out his song properly.

Spring comes early to those parts of far-western Lleyn which lie close to the sea, and sheltered under Mynydd Mawr and Mynydd Anellog. At Aberdaron (where they had had no snow, and only a few days' frost all the winter) it was as warm on Feb. 9th as it is on an average summer day. The lambs, born at Christmas, were big and strong; I gathered "palm" (*Salix*) with the golden anthers fully out, and the lesser celandine in flower; and, as I drove back through the Nant of the Horan, the alder-twigs shone with a ruddy hue. Now that the trees are bare, one notices the long grey lichen on them; this often covers old thorn-bushes, especially about the far end of Lleyn. One appreciates, too, the ivy which drapes the thin oaks in the woods there, and the seedling hollies, which spring up thickly in some plantations. The Rooks at Sarn were very busy and noisy about their nests.

So much for the winter climate and conditions of Lleyn. I feel I have taken up too much space with it, but I had a purpose in view. How strange it is that birds which we know often suffer from severe weather do not seem to care for—or, at least, to be attracted by—a soft winter climate, which, so far as we can tell, would ensure them all they want. I expected to find all the resident and winter-resident *Passeres* common to Wales congregating in this mild western land, where there is ample arable land for the hard-billed small birds to feed over; but I was quite disappointed. The ordinary small birds one sees about the fields in Oxon were conspicuous by their scarcity, almost by their absence. I have seen, I should think, ten times as many in one flock at home as I saw in Lleyn during the fortnight I spent walking about the country. Purely woodland birds were as

plentiful as usual, and the Crow family also; but the Larks, Finches, and Buntings had almost all gone. The fact is, that a great many small birds leave Lleyln in winter, instead of coming to it, as I expected they would.

I remembered one October day in 1884, which I spent on the Merionethshire coast across the bay, noticing some flocks of Larks flying out from that shore, and heading for the Carnarvon coast, and I thought at the time that they were migrating thither for the winter; but it seems it was not so. Mr. Caton Haigh kindly writes to me on this subject:—"I quite agree with you about the scarcity of small birds in N.W. Wales, except the resident woodland species, as Tits, &c. I think the Corn-Bunting is entirely a summer visitor, while the Linnet, Yellowhammer, and Reed-Bunting receive large accessions in numbers in spring." A few Chaffinches, Robins, a Wren or two, Hedge-Sparrows, and House-Sparrows are, with Tits, about all the small birds one generally sees in going about. I used to think I should have seen some hundreds of hard-billed small birds about home for every one I saw in a day's walk in Lleyln. Of course, Sparrows do not swarm there as they do with us, but this I have allowed for. At Nevin—frost-free Nevin—one afternoon, though the little fields were green and the gorse was gay, birds were very scarce. I saw a few Yellow Buntings, an immature Pied Wag-tail, a Mistle-Thrush, two Magpies, and Blackbirds in plenty, and a few Chaffinches, but heard no song from either; there was a pair of Stonechats, but no Corn-Buntings. Not much, all told, to see in a sunny February stroll. The woods at Bodfean, where the storm-broken and moss-clothed trees reared their heads on high from the damp Nant, and the tall luxuriant laurels, were silent and almost birdless each time I passed through them, save for a few Wood-Pigeons, a single Green Woodpecker, a female Sparrow-Hawk, Swans on the sombre pool (darker and more gloomy than ever), and an old Heron, which sailed in on his grey ghostly pinions, and settled half-way up a larch.

But although ordinary small birds did not abound in Lleyln, there were many most interesting species to watch; in all I saw eighty-one species—a very good and rich winter list.

It seems strange that a larger proportion of the great hosts

of the autumn immigrants do not push on into this mild soft western land, which does very well for such birds as Blackbirds and Chaffinches. But they seem rather to prefer the hardships of the winter in the eastern counties and the midlands; and, instead of Lleyn filling up with migrants, it was, as far as I could see, almost depleted of some of the so-called resident species which are common enough there in summer.

The knowledge of the winter avifauna of a district that one gets in a fortnight is, of course, not of any very great value; but at the same time it is certainly quite possible to gain a generally correct impression of it by devoting the whole of the time to the pursuit, and covering as much ground as possible (chiefly on foot, of course); for birds in winter are given to favouring certain limited areas, and deserting others.

PEREGRINE FALCON.—A male at the Bird Rock on Feb. 12th, flying about in front of the rock, and occasionally settling. As he flew he cried “quayk quayk quayk quayk,” as in spring. Mr. Caton Haigh saw Peregrines at Llanbedrog Head in March.

MERLIN.—When I was on Llanbedrog Head on the 11th a rather dark male Meriin sailed out from below, and went over the sands, the tide being low, twisting about low down. Perhaps he was trying to rouse a Dunlin, but he did not frighten the Wigeon, Gulls, and Curlews which were scattered about. He must have come back, for later on, when I was half-way down the sheltered side, he came over the top close to me with a shrill cry or two. He darted along the side of the headland, and perched on a dead ivy-branch, where he looked very pretty, backed by some green on the cliff-side.

KESTREL.—Must winter in Lleyn in some numbers, as I saw it on five occasions, and it seems a little early for migrants to have returned, though this is of course possible. On Feb. 1st, about 5 p.m. of a cold and rather stormy day, with storms of hard snow in the afternoon, I was standing at my window facing the sea, when I noticed a big bird fly to and apparently settle (out of sight) on a house to the right. I thought it was a belated Jackdaw, but in a minute it wheeled down, and settled on my window-sill, and I saw it was an old male Kestrel in perfect plumage. Thinking it might be a tame bird, I opened the

window gently, but it was off at once. Perhaps it was a storm-driven wanderer, and mistook this block of houses on the shore for a range of cliffs !

SPARROW-HAWK.—A female flew over me at Bodfean. Mr. Caton Haigh saw several coming in to roost at Nanhoran Park in March.

BUZZARD.—I take this opportunity of recording that in 1904 a Merioneth keeper, who knows the Buzzard very well, told me that about a dozen years ago he had often seen Buzzards about the eastern side of the Rivals, and had also seen it at Carn Bodfean. My wife saw what she believed were two Buzzards in the air over Bodfean on May 24th, 1902. A survey of Bardsey was made a few years ago, and a map prepared on a scale of an inch to the acre. On this are marked many ogofs round the coast (*i. e.* caves, or perhaps only chasms, for quite shallow hollows are called "ogof"). On the east side of the map I saw marked "Ogof Barcut," and also "Trwyn Ogof Barcut." Barcut is undoubtedly the Celtic name for the Buzzard.

OSPREY.—A friend told me (Sept. 25th, 1903) that in the late spring of that year he saw an Osprey on a rock on the west side of Pen-y-chain. I know that once when with another friend of mine, who knows the bird well, he watched an Osprey on the Thames, so I feel sure he was not mistaken.

DIPPER.—Seen at Afon Wen, and at Rhyd Hir Mill.

MISTLE-THRUSH.—A common bird, and then in grand song. I saw five close together in a grass field near Bodfean. A hedge-row ash was a favourite perch to sing from.

SONG-THRUSH.—More common than in summer, for, in addition to a fair number of birds in song in the usual places, I saw many feeding near the edge of the grass-marshes, or about the gorse, and at the foot of the sand-hills along the coast; on one occasion there were six or seven close together. These birds were all silent and quiet in their ways, and I thought they looked rather dark and richly coloured, but I did not shoot one. Altogether they gave me the idea that they were foreigners wintering in Lleyn.

REDWING.—I only saw one, on Feb. 3rd, between Abersoch and Llanbedrog, close to some fine thorn-bushes red with untouched berries. Mr. Caton Haigh, however, saw hundreds in

the park at Nanhoran in the middle of March; probably on migration.

FIELDFARE.—Two or three together, which I saw when driving down to Aberdaron on the 9th, were the only ones I met with.

BLACKBIRD.—Very numerous, but did not open song generally much, if any, earlier than they do in Oxon. I heard one on Feb. 3rd, and another on the 8th, but only two or three altogether by the time I left on the 13th.

HEDGE-SPARROW.—Common, but not generally in song. I have a note that one broke into song on the 6th.

ROBIN.—Abundant.

STONECHAT.—Seen on ten different days, usually about gorse or sand-hills, at Pwllheli, Llanbedrog, Nevin, and Aberdaron. On the 13th, a delicious spring-like morning, one was hawking flies from the stone wall of the esplanade at Pwllheli.

GOLDEN-CRESTED WREN.—Seen on three occasions.

WREN.—Common.

TREE-CREEPER.—Seen at Bodygroes, with Long-tailed Tits, at Pont Rhyd Hir, and at Llanbedrog.

GREAT TIT.—Common.

BLUE TIT.—Common. On the 11th a party of seven or eight in Llanbedrog village, five of them feeding in the road close together.

COAL-TIT.—Several at Llanbedrog on two occasions.

LONG-TAILED TIT.—A flock of over twenty in hedgerow-trees near Bodygroes on the 8th, and on the same day another flock of eight or ten in a spinney by the mill at Pont Rhyd Hir.

PIED WAGTAIL.—Seen twice near Pwllheli Harbour, probably the same bird, on the 1st and 2nd, and at Nevin on the 12th.

GREY WAGTAIL.—One at the mill near Pont Rhyd Hir, and another at a spring near a cottage high up at the landward end of Llanbedrog Head.

MEADOW-PIPIT.—A very few only about the shore and marshes. Seen on six days, but sometimes only an odd bird.

ROCK-PIPIT.—One or two on the shore near Pwllheli, one near the cliffs at Aberdaron, and two or three about Nevin Bird Rock; but far less common than in summer.

SKY-LARK.—Quite scarce. I saw it on eight days, but not more than a few birds altogether. There were a few birds about

Pwllheli morfa, and there on the 13th—a spring-like morning—I heard them singing for the first time.

REED-BUNTING.—Some (three or four together once) about the little farmsteads on Cilan headland; and on the 10th others about inland farms. Seen on four or five days in such places, or in the marshes.

CORN-BUNTING.—One heard, not seen, in song near Pwllheli on the 2nd was the only evidence of the presence of this bird, so common in summer.

YELLOW BUNTING.—Only noted on four days; a few only to be seen inland, but not nearly so many as in summer.

CHAFFINCH.—Quite common. A flock of about thirty feeding on the ground between Bodfean and Nevin on Jan. 31st were *nearly* all old males. Two tried to sing on the 10th, and on the 13th one was singing at Pwllheli. I expected to hear it earlier.

HOUSE-SPARROW.—One misses the familiar flocks about the fields.

GREENFINCH.—Only one seen.

GOLDFINCH.—A party of half a dozen in a tree near Broom Hall on the 4th; one sang, but poorly.

LINNET.—Strangely scarce. One or two about gorse at Aberdaron on the 9th, one near Pwllheli on the 10th, and one on Llanbedrog Head on the 11th.

BULLFINCH.—One seen at Pont Rhyd Hir Mill.

STARLING.—Seen daily, often in flocks. Those that I heard in the early mornings managed the sweet tremulous trill—the “kly-yike” and the “coor-lee” of the Curlews—all fairly well.

CHOUGH.—Met with in two of their old haunts. They have a habit of flirting up their tails and tips of their wings as they call “k'chare” or “kare” (very harsh and far sounding); the wings are slightly opened, and flipped up at the tips. This was done by a bird as it sat on a rock preening its feathers and wiping its bill after feeding; and possibly a little suspicious of me in the distance.

RAVEN.—I spent a pleasant hour with a pair on Feb. 9th, by which date they were evidently thinking about nesting, if they had not already begun. Soon after we got to the place we saw one sailing about, and directly after both birds were in sight.

One went down into the chasm, where the old breeding-place is situated, but soon came out again. This bird was very quiet, and flew up and down at a rather low elevation; probably it was the female. The other, all the time we were on the ground, sailed about well up in the air, occasionally closing his wings to shoot down a bit with queer twists and turns, and uttering from time to time his grand resonant spring cry, a deep "corp" (with almost the twang of a brass trumpet about it), once, twice, or thrice repeated. This was varied sometimes with the short hard "croc." Ravens are truly grand birds at the breeding-places in early spring.

CARRION-CROW.—Seen on seven days, and fairly common, though less so than in some parts of Wales; seen about the harbour, and pairs at Bodygroes and the Bird Rock.

ROOK.—A huge flock (and another), with Jackdaws and Starlings. One party in a field where roots had been thrown down for the stock were eating the roots, and I saw big pieces in their bills. At the Sarn rookery, on the 9th, the birds were busy and noisy, and the substantial nests looked as if they had been repaired.

JACKDAW.—Abundant; may often be seen in the streets of Pwllheli, where it seeks its meat in a very familiar way. This is perhaps the characteristic bird of North Wales, and in some parts I consider it a terrible pest. What it will be in a few years is difficult to imagine.

MAGPIE.—Quite common enough. I noted the "Pioden" on eight days.

JAY.—Fairly common. I saw one about the trees at a little farm under Mynydd Anelog, where it seemed unknown to a resident who knew most of the birds, and was greatly excited at the sight of this one at close quarters.

GREEN WOODPECKER.—Noticed on at least half a score occasions.

RING-DOVE.—Abundant in the more wooded parts; I counted seventy-one (very tame) feeding in a small field. I could not identify the Stock-Dove, which is not uncommon in summer.

PARTRIDGE.—I saw some, but I should not think Lleyn was a great Partridge country. On the other hand, parts of it seem very suitable for Pheasants, of which I saw some of the unringed race.

(To be continued.)

ON SOME HABITS OF NATTERER'S BAT.

BY T. A. COWARD.

ON Sept. 12th I received a living male Natterer's Bat (*Myotis nattereri*, Kuhl), from Mr. A. Whitaker, of Barnsley. I was able to observe a few of its habits in captivity, for it lived until Oct. 13th.

It arrived by post in the morning and, though it was rather sleepy, took food at once. It required but little teaching; only two mealworms had to be put into its mouth, the third it took from my fingers and devoured at once. After that I never had any trouble with it; its appetite was good, and no sooner had one mealworm disappeared than it was moving its head about looking for another. Like most Bats it was a thirsty animal, and was generally ready to suck the end of a camel's-hair brush dipped in water; but however thirsty it was it never cared for milk. When it had licked or sucked—for it drank in both ways—sufficient water from the brush, it would splutter and spit if more were offered to it.

In the evening of the day it arrived I was not able to visit it until 10.30 p.m., when I found it asleep. I cannot say if it had been awake and had relapsed again into lethargy, but on subsequent evenings it generally roused itself about eight o'clock. When sleeping, if taken in the hand, it became thoroughly awake in about ten minutes; the process of awakening was similar to that in other Bats—the animal panted and throbbed until it had “pumped” itself warm and lively; the rise in temperature was very noticeable. As a rule, however, I allowed it to rouse itself; it generally squeaked once or twice before it began to scramble about in its cage; when fully awake its actions were spasmodic, it moved its head constantly with that peculiar nervous action which is common to most Bats.

When released in my room it flew without hesitation either by lamplight or in the daytime. Sometimes it would keep near

the ceiling of the room and sometimes skim just above the carpet, or backwards and forwards along a sofa; it dodged in and out amongst the chair legs and beneath the table without touching anything with the tips of its wings. In this it did not differ from other captive Bats, but its appearance in flight was distinctive. Its wings were long and somewhat narrow, but the most noticeable thing was that the tail was extended when the Bat was on the wing, and was not carried half-bent beneath the body as it certainly appears to be in many species, even in the closely-allied Whiskered Bat (*cf.* Oldham, Zool. 1899, p. 52). The tail being thus extended, no pouch or bag was formed by the interfemoral membrane into which, we conclude from observations made on Bats in captivity, an insect seized is thrust until a firm grip is secured (Zool. 1899, pp. 471-474). The angle formed by the edge of the interfemoral membrane, with the tip of the tail as the apex, is remarkably obtuse in this species, and there is a distinct notch at the distal end of the calcaneum. When the Bat was on a flat surface the tail was carried in the usual curve, the tip touching the ground, and although the interfemoral pouch was not held in readiness when in flight, insects which were troublesome when captured were thrust into the pouch in the usual manner if the animal was fed when hanging or on a flat surface.

Flies, bluebottles, crane-flies, spiders, woodlice, and small mealworms were snatched from my fingers and devoured without further trouble, but when a large and powerful mealworm, a beetle, or a strong moth was given to the Bat it was immediately thrust into the pouch. The Bat withdrew its head and crunched up its prey openly directly it had secured a firm grip, but with a moth like *Plusia gamma* this was not at once accomplished; when a moth of this species or one of about the same strength was given to it, the Bat often rolled over in its struggles to overcome its victim. When once the insect was firmly held it was crunched up rapidly, the wings, and sometimes the head, being dropped.

It was by no means necessary to feed this Bat by hand; winged insects left in its cage overnight were generally missing in the morning. When it was fully awake it would endeavour to capture any buzzing insect which was put

into the cage, but its sight did not appear to be very good, and it made many wild snatches at nothing when an insect was moving in the cage. If a moth was introduced it became more excited than usual, climbed round the cage until it touched the insect, and then hurled itself upon it with great ferocity. It would, too, do what few other Bats would do, pick up an insect from the ground if one was dropped in front of it, or if it allowed one to drop from its mouth.

It would usually attempt to eat anything that was offered to it, but it was more particular about its food than some other species; it invariably dropped cooked or uncooked meat or shreds of fish, though I tried it with this food many times. Most spiders were eaten rapidly, but one or two with conspicuous markings were snatched and then rejected; a carnivorous beetle (*Carabus*) was not only treated in the same way, but the Bat, by spitting and shaking its head, showed evident signs of disgust.

About Sept. 20th I found that the Bat was often as lively in the morning as it had been at night. It is, of course, possible that this species is more or less nocturnal, as we believe the Long-eared Bat to be, and not simply crepuscular like the Noctule and Pipistrelle; or it may be that the species flies for a short time in the evening and again in the early hours of the day. It is however unwise to attempt to prove this because a Bat in captivity waked at an unusual time. Certainly my Natterer's Bat settled down to sleep immediately after it had been fed and had taken exercise in the evening, but then I cannot be sure that I gave it either as much food or exercise as it would have taken in a free state. Then, again, the period of hibernation was approaching, and the animal may have required food in greater quantity and more frequently than is usually the case, for it seems reasonable to suppose that a considerable quantity of nourishment is necessary before a prolonged sleep.

This habit of awakening in the morning, or perhaps remaining awake most of the night, gave me additional opportunities for watching the Bat on the wing. I found it did not fly for very long without resting; it would remain on the wing from ten to twenty minutes at a time, and then

would pitch on the edge of the bookcases, or on the books themselves.

When sleeping the Bat did not always hang by its feet, but often rested in a horizontal position on the floor of its cage; two sides of the cage were provided with perforated zinc, and it is possible that the animal may have felt the draught when hanging; generally, however, it suspended itself by its feet to the upper part of one of the zinc sides. When it alighted after a flight, it frequently seized hold first with its thumbs, and then did not shuffle round so rapidly as those Bats do which invariably settle in this manner; a Noctule, Long-eared, or Whiskered Bat clutches the object to which it intends to hang with its thumbs, and with great rapidity twists itself round so as to gain the usual reversed position. The Lesser Horseshoe performs a more remarkable feat: it flies to within an inch or so of the object, and then reverses itself in the air, catching first with its feet; in this way it is ready at once to drop from its hold and fly. When my Natterer's Bat wished to settle on certain objects—especially on the tip of one of a pair of Fallow-deer antlers over the door—it sometimes turned in the air after the manner of a Horseshoe. This action was not so clean or certain as in the case of a Horseshoe, and occasionally the Bat missed its hold and fell, generally recovering itself before it had fallen many inches. It was somewhat remarkable that it shared the habits of both the *Vespertilionidæ* and the *Rhinolophidæ* (for the Greater Horseshoe reverses in the air) in this respect, but did not perform either action with the same celerity or ease.

At times it would settle on the edge of a long bookcase, climb to the top, run to the far end, and from there launch forth again into the room. This exercise would be repeated several times. The Bat either remembered or smelt the spot where it had settled before, and for some days would always alight at exactly the same place. Then it would choose some other spot, and that would be favoured for two or three days, until some fresh cornice or book would be chosen. It would at times alight on the floor with its wings extended, and found no difficulty in springing from a perfectly smooth or flat surface. I never succeeded in getting it to take food from my fingers

when it was on the wing, although it would pass repeatedly over my hand, hovering for an instant close to a struggling mealworm in my fingers. It was never difficult to catch it when it had once settled, for it did not seem to fear my hand, though it objected to being held. When in the hand it continually uttered a sharp cry; it had two different notes, one—pitched much lower than the other—was a low chatter rather than the usual high-pitched cry of a Bat.

At times it used the carpus to hold a struggling mealworm, and would stand, when engaged in eating, with one wing slightly raised, as if ready to hold its prey if it proved too powerful; it never used the thumb in any way to tear its prey. In its normal position when feeding, its head was held rather low and its shoulders were somewhat hunched up. When searching for food or flying round, it either held its mouth open or chattered, opening and shutting its mouth with great rapidity.

The following are its measurements, taken immediately after death:—

Head and Body, 50 mm.	Calcaneum, 17 mm.
Expanse (stretched), 242 mm.	Thumb, 6 mm.
Forearm, 36 mm.	2nd finger, 33 mm.
Ear, 15 mm.	3rd finger, 62 mm.
Tragus, 10 mm.	4th finger, 51 mm.
Hind foot and claw, 10 mm.	5th finger, 50 mm.

The lash of hair, so characteristic of the species, extends from the termination of the calcaneum to the tip of the tail along the edge of the interfemoral membrane. There are fine hairs on the foot. The edge of the interfemoral membrane, as well as the edge of the wing membrane, is puckered or crenate: when the animal is at rest, the edge of the interfemoral membrane is slightly curved over, so that the lash of hair is not conspicuous. The hairs of the back are dark brown at the base, and reddish towards the tip; on the belly they are almost black at the base, and light grey or silvery-white at the tip. The general colour of the upper surface is reddish-grey, greyer on the nape and towards the tail. In life the under surface of the body is very white. The sebaceous glands are not prominent; the snout is short, but well-defined; the forehead rises somewhat abruptly. The ears are long in comparison with other species of *Myotis*.

If some of the habits of this example were typical of the species, we may see in Natterer's Bat the first traces of habits which have become constant in the specialised *Rhinolophidæ*. In the Horseshoes the short tail is carried recurved over the back; in *Pterygistes*, *Pipistrellus*, *Plecotus*, and some species of *Myotis*, it is usually carried curved beneath the body; in *M. nattereri* we find the tail, although used as a pouch, is carried extended behind the body. Again, the habit of turning in the air before alighting appears to be constant in the *Rhinolophidæ*, and seldom noticeable in the *Vespertilionidæ*, except in this species, where we find the Bat sometimes alights in one way and sometimes in the other. Thus in habits, though not in affinities, Natterer's Bat is intermediate between the two families, or, rather, shares some of the characteristics of each family. In its form, structure, and most of its habits it is a typical *Myotis*. Especially is this noticeable in its position when sleeping; the wings are folded as in the *Vespertilionidæ*, and not as in the *Rhinolophidæ*; indeed it is only in these partially developed habits which I have mentioned that it differs at all from its near relations.

ROUGH NOTES ON DERBYSHIRE ORNITHOLOGY,
1903-1904.

BY THE REV. FRANCIS C. R. JOURDAIN, M.A., M.B.O.U.

(Continued from 'The Zoologist,' 1904, p. 107.)

1903.—*Addenda*.—A Spotted Crake was sent to A. S. Hutchinson, which had been killed near Derby, on Oct. 27th. A Hare with a white stripe across the loins was killed near Mansfield on Dec. 7th, and three white Stoats were also sent in about the same time. During the mild but exceedingly wet winter of 1903-4, white Stoats were decidedly more common than usual. The Meadow-Pipits and Pied Wagtails, which generally migrate to the Trent Valley in the cold weather, remained in the Dove Valley throughout the winter. On Dec. 31st, during a frost, I noticed a family party of Goldcrests busily engaged in seeking for food on the ground, where, owing to the presence of springs, it was not frozen hard,—just the place where one might expect to find a Snipe. During the quarter of an hour which I spent in watching them, they showed no signs of leaving; now and then one would get up twittering and alight again a yard or two away, but that was all. As a general rule, it is rare to see this delicate little bird alight on the ground for more than a second.

A Virginian Colin sent in to A. F. Adsetts for preservation from Matlock during the autumn.

1904.

During the frosty weather of early January, we saw on three occasions Moles trotting about on the surface of the ground, apparently unable to burrow. I caught two of them, but found it difficult to hold them without injuring them. The sensitive nose was constantly twitching, and has a curious flattened, chisel-shaped appearance in life. G. Pullen reports having picked up a Jack Snipe at Egginton which had been killed by

flying against the telegraph wires; also that a Pochard had been shot, out of a small flock, on Monk's Pool, Breadsall. A hen Pheasant, assuming male plumage, with what appeared to be rudimentary spurs, was sent, on Jan. 19th, to A. S. Hutchinson, from Longstone, near Bakewell. At the end of January a couple of Scaup (*Fuligula marila*, L.) were noticed on the Trent, near Donington, and on the 31st the drake was shot on the Derbyshire side by A. S. Hutchinson, while the duck managed to escape. About the same time a female Wood or Summer Duck (*Aix sponsa*) was shot by Mr. Young on the Derwent, near Duffield.

The only cold weather of the whole winter was experienced between Feb. 17th and March 2nd, when there was some snow. On Feb. 24th two wild Swans were seen by a labourer flying down the Dove Valley towards Hanging Bridge. His attention was attracted by their notes. On Feb. 27th, about 4.15 p.m., while in the garden, I heard in the distance sounds something like the 'honks' of the Canada Geese which flight up and down the Dove Valley. As they came nearer, the difference in the notes became apparent, and when at last the birds came in sight I noticed that the formation of the herd in flight was in an extended line, almost abreast of one another. When first sighted they were coming up the valley of the Dove, but leaving Mayfield on the left, they swerved to the right, and passed right overhead across Clifton. At close quarters it was obvious that they were wild Swans—the long necks, white plumage and black feet directed backwards were all plainly visible as the long line of forty great birds passed over, keeping up a continual succession of calls as long as they remained in sight. After many enquiries I ascertained that the herd had been observed at Calwich, Mayfield, Clifton, Edlaston, near Longford, and at Calke Abbey. Finally they appear to have reached Swithland Reservoir, Leicestershire, on the same day, where they were satisfactorily identified by Mr. O. Murray Dixon as *Cygnus bewicki*. From information kindly furnished to me by Mr. Dixon, I am enabled to state that twenty-five birds left Swithland on Sunday night (Feb. 28th), but the remaining fifteen stayed on undisturbed till Monday, March 7th, when the Rev. J. Murray Dixon, hearing their calls, was in time to see them rise from the

water in a string and take a north-easterly direction about 9 a.m.

Mr. O. Murray Dixon had many opportunities of watching them through strong glasses, as they sat on a marshy strip of land which juts out into the reservoir. He noticed that, when disturbed, they had a peculiar habit of erecting the neck to its full extent, and then nodding with a curious jerky motion. When bathing, they did not flounder about like *C. olor*, but dipped their necks into the water, allowing it to flow over their backs in a most graceful manner.

On the return journey they appear to have again passed over Calke, as a herd (estimated at eighteen in number) was seen flying eastward about this time, and perhaps the two separated portions of the herd were finally reunited, as Mr. G. Pullen reports that thirty-five Swans were seen passing over the sewage farm at Egginton about March 29th, while twenty-two Grey Geese were seen flying low at the same place on the following day.

I have only notes of three previous occurrences of Bewick's Swan in Derbyshire, and the only Staffordshire record, quoted by McAldowie ('Birds of Staffordshire,' p. 106), is included in error, as the bird in question was really killed in Derbyshire. Mr. Montagu Brown, in the 'Birds of Leicestershire' (Addenda, p. 172), gives a single instance of the occurrence of this species.

The Lapwings began to lay exceptionally early this year, and on March 18th two nests were found near Repton with four and one egg respectively. The three eggs in a Brown Owl's nest examined on March 31st had obviously been incubated for some time.

On April 7th Swallows were hawking up and down the Dove Valley, a day or two before the Sand Martins arrived. The latter birds are, as a rule, the first of the *Hirundinidæ* to appear. Curiously enough, not a single Chiffchaff visited the Upper Dove Valley till quite late in the summer, although usually fairly common there. The only locality in the district where they appear to have bred was Shirley Park, where several birds were heard early in June. At West Hallam the Rev. C. Birley found a Thrush's nest on April 7th in the middle of a bare meadow—not even sheltered by a grass tuft, but

standing up above the level of the ground. A prematurely laid Lapwing's egg, picked up near Alsop-en-le-Dale on April 12th, was abnormally long (60 mm.), pale bluish-white in colour, with a few small black spots at the large end. Two or three nests of the Mistle-Thrush were built at heights varying from four to six feet; one of them was placed in a thick bit of hedge at Clifton—exactly the site for a Song-Thrush's nest. Hereabouts many eggs of *T. viscivorus* are devoured by Magpies, and, apparently, these low sites near buildings are chosen in order to avoid them.

A hollow in a rough stone wall by the River Dove, which has been occupied by Grey Wagtails several times, contained a nest with five eggs, much incubated, on May 2nd. The sitting bird was obviously the cock, conspicuous by his black throat.

May 13th.—Watched a Dabchick sitting on eggs in a nest not many yards from a main road. Finding herself observed, she raised herself half up, and with great energy dragged weeds over the nest, finishing up with a header over the side!

Several Nightingales were reported from the south of the county. The Rev. F. F. Key heard one in full song in mid May, close to the River Dove, near Claymills. Another was recorded from Stramshall, near Uttoxeter (Staffordshire), and there is some reason to believe that a pair bred near Calwich, besides a pair which nested in the Hopwell district (W. H. Walton).

A Quail, injured by flying against the telegraph wires on the night of May 15th, was picked up in the streets of Derby. (G. Pullen.)

A pair of Willow-Wrens built their nest this year in some trellis-work, close to my dining-room, almost exactly 5 feet from the ground; while a common Sandpiper successfully hatched off her young from a nest in a strawberry bed in a garden close to the River Dove. At least two nests of the Dipper (*Cinclus aquaticus*) are annually built on the girders or in the stonework of bridges on the North Staffordshire Railway not more than a couple of feet from the metals, so that the noise and concussion caused by passing trains must be very considerable.

Great Crested Grebes are now decidedly on the increase in the county. A pair bred at Osmaston this year, and there

were at least four on the pond at Sudbury Hall later in the season.

June 19th.—Watched a Spotted Flycatcher feeding young in a nest behind a bend in a rainwater pipe, quite twenty-one feet from the ground. Nearly all the nests I have seen have been about half this height.

21st.—Explored several osier-beds near Egginton, and found seven nests of Reed Warblers, with eggs or young. All but one were in forks of osiers from three to six feet from the ground; the seventh was slung between two stems of the common dock, and was about two feet three inches high. None of the nests contained Cuckoos' eggs, although no fewer than six were found in one osier-bed in 1902. Cuckoos were, however, scarcer than usual in South Derbyshire; the only eggs I heard of were both laid in Hedge Sparrows' nests.

22nd.—Professor Barker reports having seen three Fieldfares to-day in Monk's Dale and heard their peculiar "chacking" note. While botanizing in August, he, on two occasions, saw these birds again, and once heard one.

On June 23rd a splendid Honey Buzzard was shot by a keeper at Allestree, near Derby. I saw this bird for a few minutes while in Mr. Adsetts' hands. The colouring of the upper parts was uniformly ashy brown, while the breast, tibial tufts, and underwings were beautifully barred. Unfortunately the sex was not ascertained, but I believe it to have been a hen—possibly the mate of the male which had been killed in Nottinghamshire not long previously. The feet were covered with earth, as is often the case with this species.

28th.—The Rev. F. F. Key reports a white Blackbird and a dove-coloured Thrush from Egginton. A nest of the Lesser Redpoll, found on the 27th, contained six eggs, rather an unusual number. While looking over the collection of a friend I was surprised to notice a beautiful set of five eggs of the Grey Wagtail, taken on June 8th in Staffordshire, which were of a distinctly reddish type, about the colour of normal Robins' eggs, but with a reddish hair line at the big end. As far as I am aware this variety has not been previously met with in England, although known on the continent, since Dr. E. Rey refers to it in his work on the Oology of Central Europe (p. 279).

Aug. 25th.—Last Swift seen. A hollow oak tree, which was occupied by White Owls in 1900 and 1901, but annexed by a pair of Brown Owls in 1902 and unoccupied in the following year, showed traces of down near the entrance on Aug. 30th. Looking in, a row of five or six young White Owls, nearly fledged, could be dimly seen, all with their backs to the wall, and hissing vigorously.

Tufted Duck were more plentiful than ever on the ponds at Osmaston, and the head-keeper estimated the number of breeding birds at thirteen couple.

Mr. H. G. Tomlinson, while fishing on the Dove at Sudbury, flushed an Oystercatcher from a shingle bank in the river on Oct. 28th.

On Nov. 4th an adult male Scoter (*Edemia nigra*) was shot on the Dove, at Hanging Bridge, by Mr. R. H. Bond. It had been noticed on the previous day, and when approached attempted to escape by diving and was very loth to take wing.

Large numbers of Snipe are now killed on the Sewage Farm by a system of driving, the guns being posted in butts. Sixty are said to have been shot in one day by this means at Egginton. Among them was a single Dunlin. Mr. G. H. Storer informs me that Ruffs were again seen here this year, but fortunately none were shot. A Grey Phalarope was brought to him from Anslow (Staffordshire) towards the end of November, in the very severe weather which lasted from Nov. 21st to 29th.

A remarkable feature of the autumn and winter of 1904-5 was the large number of Water-Rails (*Rallus aquaticus*) which were met with in different parts of South Derbyshire by shooting parties. As a breeding species, this bird is remarkably scarce in this district, and it would be interesting to learn whence these immigrants come.

ADDITIONS AND CORRECTIONS TO THE 'INDEX
ZOOLOGICUS' OF C. O. WATERHOUSE.

By E. BERGROTH, C.M.Z.S.

MR. C. O. WATERHOUSE has recently published* a supplement to the 'Index Zoologicus,' compiled by him and edited by Dr. D. Sharp in 1902. In this supplement about two hundred and fifty omitted names are recorded, and in the supplement given below about three hundred names are added. Unfortunately I have in many cases been unable to give the date of the publication, but only names published before 1901 are included. Doubtless many hundred names are still unrecorded—particularly in the Crustacea, Vermes, Cœlenterata, Spongiæ, and Protozoa—and I am convinced that students of these classes would easily be able to fill the gaps. Among the fossil genera there are also certainly very numerous omissions.

ADDITIONS.

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|---|---|
| Abila, <i>Stal</i> , Orth., 1878. | Apoblema, <i>Dujardin</i> , Verm. |
| Abisares, <i>Stal</i> , Orth., 1878. | Apotomopterus, <i>Kraatz</i> , Col., 1894. |
| Abothrium, <i>Beneden</i> , Verm. | Aptychopsis, <i>Barrande</i> , Crust. |
| Acanthocaris, <i>Peack</i> , Crust., 1884. | Arctonotus, <i>Boisduval</i> , Lep., 1852. |
| Acanthodictya, <i>Hinde</i> , Spong. | Arete, <i>Stimpson</i> , Crust. |
| Acmæopleura, <i>Stimpson</i> , Crust. | Argiope, <i>Audouin</i> , Arachn., 1827. |
| Actæcia, <i>Dana</i> , Crust., 1852. | Armadilloniscus, <i>Budde-Lund</i> ,
Crust., 1885. |
| Ægiochus, <i>Bovallius</i> , Crust., 1885. | Asteractinella, <i>Hinde</i> , Spong. |
| Agama, <i>Blake</i> , Hym., 1871. | Athelges, <i>Hesse</i> , Crust. |
| Aleinous, <i>Costa</i> , Crust. | Atyephyra, <i>Brito Capello</i> , Crust. |
| Alpheoides, <i>Paulson</i> , Crust., 1880. | Atyoida, <i>Randall</i> , Crust. |
| Amphischizops, <i>Montandon</i> , Hem.,
1898. | Bactronella, <i>Hinde</i> , Spong. |
| Ancistrocephalus, <i>Monticelli</i> , Verm. | Bathytropa, <i>Budde-Lund</i> , Crust.,
1885. |
| Angasia, <i>White</i> , Crust. | Becksia, <i>Schlüter</i> , Spong. |
| Aniphiaulax, <i>Kokujev</i> , Hym., 1899. | Bernius, <i>Stal</i> , Orth. |
| Anomophænus, <i>Fauvel</i> , Col., 1882. | Binkhorstia, <i>Noetling</i> , Crust., 1882. |
| Anoplocephala, <i>Blanchard</i> , Verm.,
1868. | Bircenna, <i>Chilton</i> , Crust., 1883. |
| Ansa, <i>Walker</i> , Hem., 1868. | Blepharipoda, <i>Randall</i> , Crust., 1839. |
| Antiphon, <i>Stal</i> , Orth., 1878. | Bœckia, <i>Brögger</i> , Crust., 1882. |

* 'Supplementary List of Generic Names.' London: O. E. Janson & Son. 1904.

- Brachyiulus, *Berlese*, Myr., 1884.
 Calacanthia, *Reuter*, Hem., 1891.
 Calliopius, *Chilton*, Crust., 1884.
 Callobdella, *Beneden*, Verm.
 Camerospongia, *Orbigny*, Spong.
 Campodes, *Koch*, Myr.
 Campocoris, *Puton*, Hem., 1886.
 Caradina, *Milne-Edwards*, Crust.
 Carinina, *Hubrecht*, Verm.
 Caryocaris, *Salter*, Crust.
 Casearia, *Quenstedt*, Spong.
 Catantops, *Schaum*, Orth., 1853.
 Celyphia, *Pomel*, Spong.
 Centromachus, *Thorell*, Arachn., 1885.
 Centroscelicoris, *Puton*, Hem., 1886.
 Cercocytonus, *Budde-Lund*, Crust., 1885.
 Chalia, *Walker*, Hem., 1858.
 Chapuisia, *Duvivier*, Col., 1885.
 Chartoscirta, *Stal*, Hem., 1868.
 Chilostetha, *Jakovlev*, Col., 1889.
 Chiloxanthus, *Reuter*, Hem., 1891.
 Chlænidius, *Chaudoir*, Col.
 Chlorida, *Eydoux & Souleyet*, Crust.
 Chortippus, *Fieber*, Orth., 1853.
 Chrysoblemma, *Jakovlev*, Col., 1889.
 Clathrospongia, *Hall*, Spong.
 Cleodictya, *Hall*, Spong.
 Climacospongia, *Hinde*, Spong.
 Corixidea, *Reuter*, Hem., 1891.
 Coryphælus, *Puton*, Hem., 1886.
 Coryphænoides, *Gunnerus*, Pisc., 1765.
 Costiella, *Reuter*, Hem., 1890.
 Creobius, *Semenov*, Col., 1900.
 Crossodera, *Dujardin*, Verm.
 Cryptommatus, *Matthews*, Col.
 Cryptoniscus, *Müller*, Crust., 1870.
 Cryptothir, *Dana*, Crust., 1852.
 Ctenocnemis, *Fieber*, Hem., 1861.
 Cyathocephalus, *Kessler*, Verm.
 Cyathophycus, *Walcott*, Spong.
 Cyclorrhynchus, *De Haan*, Crust.
 Cylisticus, *Schnitzler*, Crust., 1853.
 Cylloma, *Budde-Lund*, Crust., 1885.
 Cypellia, *Zittel*, Spong.
 Cyrianassa, *Spence Bate*, Crust.
 Cyrtacanthacris, *Walker*, Orth.
 Cystispongia, *Roemer*, Spong.
 Darma, *Walker*, Hem., 1858.
 Deidamia, *Clemens*, Lep., 1859.
 Demodocus, *Stal*, Orth., 1878.
 Dexiocerella, *Haswell*, Crust., 1885.
 Diacira, *Walker*, Hem., 1858.
 Diaphanometopus, *Schmidt*, Crust., 1881.
 Dictyophyton, *Hall*, Spong., 1863.
 Didymosphæra, *Link*, Spong.
 Diops, *Paulson*, Crust.
 Dipharagus, *Dujardin*, Verm.
 Diploiulus, *Berlese*, Myr., 1883.
 Dipterocaris, *Clarke*, Crust., 1883.
 Discosphæra, *Haeckel*, Prot.
 Dorylæmus, *Dujardin*, Verm.
 Drepanosorus, *Simon*, Crust., 1886.
 Ectenodictya, *Hall*, Spong.
 Elania, *Mulsant & Rey*, Col., 1867.
 Elasmotoma, *Fromental*, Spong.
 Elina, *Ferrari*, Hem., 1878.
 Eluma, *Budde-Lund*, Crust., 1885.
 Elymocariss, *Beecher*, Crust., 1884.
 Enoplus, *Dujardin*, Verm.
 Eoiulus, *Kusta*, Myr., 1885.
 Eolycosa, *Kusta*, Arachn., 1885.
 Episcopus, *Saussure*, Orth., 1875.
 Epora, *Stal*, Hem., 1866.
 Ercycon, *Rey*, Col., 1886.
 Errhomenellus, *Puton*, Hem., 1886.
 Ethelum, *Budde-Lund*, Crust., 1899.
 Eudorella, *Norman*, Crust.
 Eunapius, *Stal*, Orth., 1876.
 Eupreocnemis, *Fieber*, Orth., 1853.
 Eurycyde, *Schiödte*, Arachn.
 Eutaphrimorphus, *Pic*, Col., 1899.
 Euthrips, *Targioni-Tozzetti*, Thysanopt., 1886.
 Florilinus, *Mulsant & Rey*, Col., 1867.
 Geralinura, *Scudder*, Arachn., 1884.
 Geraphrynus, *Scudder*, Arachn., 1884.
 Gerardia, *Lacaze-Duthier*, Cœl.
 Glenocorixa, *Thomson*, Hem., 1869.
 Glyphiulus, *Gervais*, Myr.
 Glyptoscorpis, *Peach*, Crust., 1884.
 Gongylonema, *Molin*, Verm.
 Graphoceræus, *Thomson*, Hem., 1870.
 Haimea, *Milne-Edwards*, Cœl.
 Halla, *Costa*, Verm., 1844.
 Harpina, *Novák*, Crust., 1884.
 Harporrhynchus, *Sars*, Crust.
 Helocerus, *Mulsant & Rey*, Col., 1867.
 Hemiclepsis, *Vejdovsky*, Verm.
 Hemilamprops, *Sars*, Crust., 1882.
 Heterochara, *Rey*, Col., 1875.
 Heterogramma, *Guenée*, Lep., 1854.
 Hiallum, *Budde-Lund*, Crust., 1899.
 Hippota, *Walker*, Hym.
 Hircella, *Haswell*, Crust., 1885.
 Homolichas, *Schmidt*, Crust., 1885.
 Hoplistura, *Jakovlev*, Col., 1889.
 Hoplitocranum, *Jakovlev*, Col., 1896.
 Hyalostelia, *Zittel*, Spong.
 Hydrolimax, *Haldeman*, Verm.
 Hymenocaris, *Salter*, Crust.

- Hymenocephalus, *Giglioli*, Pisc., 1884.
 Hypocrita, *Herrich-Schüffer*, Lep.
 Hypogium, *Tschitscherin*, Col., 1900.
 Idiomelas, *Tschitscherin*, Col., 1900.
 Iglesias, *Costa*, Crust., 1883.
 Ino, *Schranck*, Crust., 1803.
 Ino, *Koch*, Arachn., 1850.
 Iphinoë, *Spence Bate*, Crust.
 Læviulus, *Berlese*, Myr., 1884.
 Lasiothrix, *Hinde*, Spong.
 Lathridulus, *Wollaston*, Col., 1877.
 Lathrinus, *Waltl*, Col.
 Leptorrhynchus, *Herrick*, Crust., 1885.
 Lernæenicus, *Lesuer*, Crust.
 Leuconea, *Duponchel*, Lep., 1844.
 Leusaba, *Walker*, Hem., 1857.
 Lingulocaris, *Salter*, Crust.
 Liospongia, *Orbigny*, Spong.
 Liriopsis, *Schultze*, Crust., 1859.
 Lisgocaris, *Clarke*, Crust., 1882.
 Logesius, *Gozis*, Col., 1875.
 Lophactæa, *Milne-Edwards*, Crust., 1862.
 Lophura, *Kolliker*, Crust.
 Loriculina, *Dames*, Crust., 1885.
 Lubomirskia, *Dybowski*, Spong.
 Lucifer, *Thompson*, Crust.
 Lyprobius, *Budde-Lund*, Crust., 1885.
 Lyrodictya, *Hall*, Spong.
 Macrocorixa, *Thomson*, Hem., 1869.
 Macropes, *Motschulsky*, Hem., 1859.
 Malacopsylla, *Weyenbergh*, Aphanipt., 1881.
 Marmara, *Clemens*, Lep., 1863.
 Medusichnites, *Matthew*, Cœl.
 Meganebrius, *Kraatz*, Col., 1895.
 Melanopsis, *Gozis*, Col.
 Mesocerus, *Reuter*, Hem., 1888.
 Metopias, *Eichwald*, Crust.
 Metschnikovia, *Grimm*, Spong.
 Micilus, *Mulsant & Rey*, Col., 1872.
 Micromithrax, *Noetling*, Crust., 1882.
 Microphrys, *Milne-Edwards*, Crust., 1851.
 Miogypsina, *Sacco*, Prot.
 Mioplax, *Bittner*, Crust., 1884.
 Mirulus, *Mulsant & Rey*, Col., 1872.
 Moncheca, *Walker*, Orth., 1860.
 Mononeus, *Bastian*, Verm.
 Monorchis, *Monticelli*, Verm.
 Muggiæa, *Bausch*, Cœl.
 Myicola, *Wright*, Crust., 1885.
 Mystrophora, *Klapálek*, Neur., 1892.
 Myzomimus, *Stiles*, Verm.
 Nannocoris, *Reuter*, Hem., 1891.
 Neoatherina, *Castelnau*, Pisc.
 Neottiglossa, *Kirby*, Hem., 1837.
 Nieszkovskia, *Schmidt*, Crust., 1881.
 Niobe, *Brögger*, Crust.
 Nithecus, *Horváth*, Hem., 1890.
 Nordenskiöldiella, *Haglund*, Hem., 1899.
 Norosus, *Mulsant & Rey*, Col., 1869.
 Nyctodaetylus, *Marsh*, Rept., 1881.
 Olbia, *Marcusen*, Crust.
 Ommatiulus, *Latzel*, Myr., 1884.
 Oncolichas, *Schmidt*, Crust., 1885.
 Ononia, *Fischer*, Crust., 1885.
 Ophirhaphidites, *Carter*, Spong.
 Ophthalmolampis, *Saussure*, Orth.
 Ophiulus, *Berlese*, Myr., 1884.
 Orchamus, *Stal*, Orth.
 Ornithostoma, *Seeley*, Rept., 1871.
 Oropsime, *Gozis*, Col.
 Orthopodes, *Tullberg*, Cœl.
 Pachygrapsus, *Randall*, Crust.
 Pachyulus, *Berlese*, Myr., 1883.
 Palæmonella, *Dana*, Crust., 1852.
 Palæopalæmon, *Whitfield*, Crust., 1880.
 Parabolinella, *Brögger*, Crust., 1882.
 Paradosis, *Zeller*, Lep., 1854.
 Paralomis, *White*, Crust., 1856.
 Paranaenia, *Chilton*, Crust., 1883.
 Paraphronima, *Claus*, Crust.
 Paribæus, *Dana*, Crust., 1852.
 Periscyphis, *Gersticker*, Crust., 1873.
 Petalomera, *Sars*, Crust., 1882.
 Petrosia, *Vosmaer*, Spong.
 Phanodemus, *Costa*, Crust.
 Phlæoba, *Stal*, Orth., 1862.
 Phœbe, *Koch*, Arachn., 1850.
 Phragmodictya, *Hall*, Spong.
 Phryssonotus, *Scudder*, Myr., 1885.
 Physocaris, *Salter*, Crust.
 Physospongia, *Hall*, Spong.
 Pitedia, *Reuter*, Hem., 1888.
 Planes, *Bell*, Crust.
 Platistus, *Herrich-Schüffer*, Hem., 1853.
 Platychelus, *Costa*, Crust.
 Platygrapsus, *Stimpson*, Crust.
 Platyleurus, *Mulsant & Rey*, Hem., 1865.
 Platypterna, *Fieber*, Orth., 1853.
 Plectroplites, *Gill*, Pisc., 1863.
 Plinthisomus, *Fieber*, Hem., 1864.
 Plæariola, *Reuter*, Hem., 1888.
 Poliochera, *Scudder*, Arachn., 1884.
 Polycelis, *Thomson*, Hym., 1878.

- Polycelia, *Fromentel*, Spong.
 Porospongia, *Orbigny*, Spong.
 Prionosoma, *Uhler*, Hem., 1863.
 Prionoxys, *Semenov*, Col., 1898.
 Proctolabus, *Saussure*, Orth.
 Prolobodes, *Amyot & Serville*, Hem., 1843.
 Promecocoris, *Puton*, Hem., 1886.
 Prosthetes, *Hesse*, Crust.
 Protopeltura, *Brögger*, Crust., 1882.
 Pseudanarta, *Edwards*, Lep., 1875.
 Pseudochrysis, *Semenov*, Hym., 1891.
 Pseudogalatea, *Peach*, Crust., 1884.
 Pseudoniscus, *Costa*, Crust., 1883.
 Pseudonotoxus, *Pic*, Col., 1899.
 Pseudosiriella, *Claus*, Crust., 1884.
 Pseudosphærexochus, *Schmidt*, Crust., 1881.
 Pseudovermis, *Perejaslvtseva*, Moll., 1891.
 Pterygometopus, *Schmidt*, Crust., 1881.
 Ptychochilus, *Novák*, Crust.
 Ptychodera, *Eschscholtz*, Verm.
 Rhabdosphæra, *Haeckel*, Prot.
 Rhachicentron, *Kaup*, Pisc., 1826.
 Rhapidonema, *Hinde*, Spong.
 Rhombodictyon, *Whitfield*, Spong.
 Rhynchocyclus, *Stimpson*, Crust.
 Rhysida, *Wood*, Myr., 1863.
 Scelopendrides, *Saussure*, Myr., 1858.
 Siphonocelia, *Fromentel*, Spong.
 Siphonophanes, *Simon*, Crust., 1886.
 Solenomormyrus, *Bleeker*, Pisc., 1874.
 Spathiocaris, *Clarke*, Crust., 1882.
 Sphæriifer, *Richiardi*, Crust., 1876.
 Sphecodina, *Blanchard*, Lep., 1841.
 Spinosella, *Vosmaer*, Spong.
 Stegoplax, *Sars*, Crust., 1882.
 Steinmannia, *Waagen & Wentzel*, Spong.
 Stellispongia, *Orbigny*, Spong.
 Stenomalus, *Thomson*, Hym., 1878.
 Sycocarpus, *Haeckel*, Spong.
 Syocubus, *Haeckel*, Spong.
 Syngastron, *Costa*, Crust., 1883.
 Syntomogaster, *Costa*, Crust., 1882.
 Tanymastix, *Simon*, Crust., 1886.
 Tegania, *Rauff*, Spong.
 Tenaga, *Clemens*, Lep., 1862.
 Teraicum, *Chilton*, Crust., 1883.
 Teraturus, *Kokujev*, Hym., 1899.
 Thalassiocaris, *Stimpson*, Crust.
 Thalenessa, *Baird*, Verm.
 Thamnodictya, *Hall*, Spong.
 Tholiasterella, *Hinde*, Spong.
 Thoosa, *Hancock*, Spong.
 Thoracostoma, *Marion*, Verm.
 Thrinacophora, *Roemer*, Spong.
 Tomyrium, *Reitter*, Col., 1880.
 Triopes, *Schranck*, Crust., 1803.
 Trochospongilla, *Vejdovsky*, Spong.
 Tropidocaris, *Beecher*, Crust., 1884.
 Tropidopola, *Stal*, Orth., 1873.
 Turcmenigena, *Melgunov*, Col., 1893.
 Typhliulus, *Latzel*, Myr., 1884.
 Vaunthompsonia, *Spence Bate*, Crust.
 Wankowiczium, *Flach*, Col., 1889.
 Westwoodilla, *Spence Bate*, Crust.
 Xyliulus, *Lacoe*, Myr., 1883.
 Xylodes, *Guenée*, Lep.
 Zeppelinia, *Vaillant*, Verm.

CORRECTIONS.

- Page 1, for *Abrieta read* *Abrieta*.
 " 2, for *Acalanthus read* *Acalathus*.
 " 56, for *Calacorisca read* *Calocorisca*.
 " for *Calistella read* *Callistella*.
 " 58, for *Caloptenodia read* *Caloptenobia*.
 " 65, for *Centrogenous read* *Centrogenus*.
 " 66, for *Cerandryus read* (p. 147) *Gerandryus*.
 " 73, for *Chloroneura, Walker, 1864, read* *Chloroneura, Walsh, 1862*.
 " 79, for *Clibanirius read* *Clibanarius*.
 " 108, for *Dinothenarus, Des Gozis, 1886, read* *Dinothenarus, Thomson, 1859*.
 " 115, for *Drymocoria read* *Drymocoris*.
 " 121, omit *Elephotherium*; it is recorded, p. 120, correctly as *Elaphotherium*.
 " 122, omit *Empoasca, Goding (1890) and Walker (1864)*; it is recorded correctly with *Walsh (1862)* as author.
 " 125 or *Epactius, 1891, read* *Epactius, 1791*.

- Page 134, for *Euloba*, *Uhler*, 1884, read *Euloba*, *Westwood*, 1874.
 „ 141, for *Fahrea* read *Fahraea*.
 „ 183, for *Ischnocelicoris* read *Ischnoscelicoris*.
 „ 192, for *Lanuovia* read *Lanuvia*.
 „ 205, for *Luceronia* read *Leuceronia*.
 „ 208, for *Machlopis* read *Machlopsis*.
 „ 216, for *Melampsalla* read *Melampsalta*.
 „ 224, for *Micromichilus* read *Micromicilus*.
 „ 247, omit *Ochthera* and *Ochtherus*, *Bergroth*; these are old genera of
 Latreille.
 „ 262, for *Palachus* read *Palacus*.
 „ 277, for *Pericyphops* read *Periscyphops*.
 „ 286, for *Phradonoma*, *Mulsant*, 1867 read *Phradonoma*, *Duval*, 1859.
 „ 293, for *Platysomus* read *Platystomus*.
 „ 341, for *Semiotoscles* read *Semiotosceles*.
 „ 362, for *Synerotus* read *Syncerotus*.
 „ 386, for *Tropistostrochrus* read *Tropistotrochus*.
 „ 403, omit *Ahanga*; it is recorded correctly, p. 22, as *Anhanga*.
 „ 499, omit *Cocoteris*; it is recorded correctly in *Scudder's* 'Nomen-
 clator' as *Coctoteris*.

Tammerfors, Finland.

NOTES AND QUERIES.

MAMMALIA.

Leisler's Bat in Yorkshire.—Mr. Arthur Whitaker, of Worsborough, near Barnsley, recently sent for my inspection a stuffed specimen of a Leisler's Bat (*Pterygistes leisleri*, Kuhl), which had been taken, together with two other examples, from a hollow beech at Stainborough, near Barnsley, on May 18th, 1904. The other two Bats were unfortunately destroyed, but Mr. Whitaker is sure that they were similar to the specimen sent to me. All three of them were males. The specimen, and another which was taken in the same locality—also from a beech—on March 23rd, 1903, were subsequently sent to Mr. Oldfield Thomas, who confirmed our identification. So little is known about the distribution of Leisler's Bat—at any rate, in England—that every record is of value. In a paper on the species in the 'Irish Naturalist' (1899, pp. 169–174), Dr. N. H. Alcock described the distribution so far as it was known. In Ireland, where it takes the place of the Noctule, it occurs in most counties in the east and north-east, but in England its known distribution is discontinuous. Mr. R. F. Tomes (Bell's 'British Quadrupeds,' 2nd edit. p. 27) speaks of "its not unfrequent appearance at various localities in the course of the River Avon, in the counties of Warwick, Worcester, and Gloucester," and mentions "a British-killed specimen in the collection of Mr. F. Bond." Fourteen examples were said to have been obtained in Norfolk (Paine, 'Ann. Nat. Hist.' ii. 1839, p. 181), but the identification of these was questioned, and no proof has been forthcoming. In May, 1899, I shot one in Cheshire, and saw another Bat at the same time which resembled in its flight the one I secured ('Zoologist,' 1899, p. 266). In Yorkshire the species has been recorded from three different localities, all within a somewhat limited area in the south of the county. Messrs. Clarke and Roebuck ('Vert. Fauna of Yorks.' 1881, p. 4) mentions three which were taken "about forty years ago" from an old factory chimney-shaft at Hunslet, near Leeds, and that one of these was preserved in the collection of the late Mr. F. Bond. No doubt this is the example mentioned by Mr. Tomes. In 'The Zoologist' (1892, p. 329), Mr. H. Charbonnier states that in May and June, 1890, he received several examples which

had been shot on the wing at Mexborough, about eight miles from Barnsley. In this case again the identification was questioned, but, beside the fact that one specimen is now in the Natural History Museum, South Kensington, Dr. Alcock has examined two of the examples, and declares that "they are undoubtedly" of this species. The known range of Leisler's Bat in England is thus confined to three—or, if the Norfolk record was correct, four—distinct areas. Certainly, South Yorkshire and Cheshire are not far apart, but we must remember that they are separated by the high ground of the Pennines and Peak, and these northern localities are far removed from the valley of the Avon. Surely the species must, as Mr. Tomes suggested, be commoner than is generally supposed, and might be found to occur in many counties between these extreme limits. Probably it has been repeatedly confused with the larger Noctule; if any observers secure what appear to them to be small dark-coloured Noctules, it will be worth while to examine the teeth, or, better still, to submit the specimens to the authorities at the British Museum.—T. A. COWARD (Bowdon, Cheshire).

De Winton's Mouse in Surrey.—It may be of interest to record the occurrence of *Mus sylvaticus wintoni* at Churt, in Surrey, where last winter I trapped one in an ordinary Mouse-trap baited with cheese, in a hedge-bank at the edge of a garden. The specimen was examined by Mr. W. Cole, Curator of the Epping Forest Museum, who advised me to send a note to 'The Zoologist' on its occurrence in Surrey. My specimen is a large one, and differs slightly from one in the possession of Mr. Cole, which difference he ascribes to age. The specimen is now being mounted.—G. DENT (Hatfields, Loughton, Essex).

A V E S.

Late Breeding of Swallow, and Birds building in other Birds' Nests.—On Sept. 11th, 1903, my attention was called to a Barn-Swallow's nest under the eaves of a house. The owner and I watched for some time, and counted seven adult birds, all engaged in feeding the nestlings. This is very late for this district, where I have never seen any *Hirundo rustica* after Sept. 20th. Supplementing the notes on "Birds building in other Birds' Nests" (*ante*, p. 33), I found last year a Robin's nest built upon a Barn-Swallow's nest of the previous year. I also found and photographed a Coot's nest with seven eggs and one Moorhen's egg; also a Song-Thrush's nest with five eggs and one Blackbird's egg.—T. THORNTON MACKEITH (Hall of Caldwell, Uplawmoor, Renfrewshire).

Cirl-Bunting (*Emberiza cirlus*) in Somerset.—While reading an article, by Mr. O. V. Aplin, on the distribution of the Cirl-Bunting in Great Britain, in 'The Zoologist' for 1892, I was interested in a note on that bird from one of his correspondents, the Rev. Murray A. Mathew. On p. 176 these words are quoted from one of the latter gentleman's letters:—"I never once met with it during the seven years I resided at Weston-super-Mare." On referring to a Clerical Directory it seems that those years were 1863-1869, and it may be interesting to note that since that time this species has become well established in the district. My own notes on this species in the Weston-super-Mare district extend over the years 1898-1904, and during that time I have noticed that the species is by no means uncommon, and in certain parts almost abundant. Early in the year I have seen them in small parties foraging for seeds with Yellow Buntings, Larks, and other small birds. The earliest date on which I have a note of having heard the song is March 19th, and the latest August 7th. The species may be met with sparingly all round Weston in the breeding season, but their numbers seem to increase as one travels south of that town towards Bridgwater, and I have found the species more numerous in the neighbourhoods of Bleadon, Brent Knoll, and on the western slopes of the Polden Hills. On July 6th last year, while riding from Weston to Highbridge, I heard numbers of these birds singing by the roadside, and in one locality near East Brent four or five might be heard singing at the same time. The song is very characteristic, and when once learnt need never be confused with that of the Yellow Bunting. The singer is usually concealed amongst the higher branches of a hedgerow-elm. Colonel Montagu received specimens of this bird from Bridgwater a hundred years ago, and its extension of range must have been very slow if it is true that some seventy years later it had not reached as far as Weston-super-Mare.—F. L. BLATHWAYT (Lincoln).

Black-tailed Godwit in Norfolk.—On Jan. 11th I obtained, at a game-dealer's shop in Bury, in almost complete winter plumage, a female *Limosa belgica*, which was hanging up with two or three Red-shanks, and had been consigned from Lynn. Though once a regular breeder in East Anglia, it is now a rather rare visitor, especially in winter, and I was glad to get this specimen, much as I could have wished it had come into my hands before being gibbeted on a substantial hook, thrust in at the chin and out at the base of the upper mandible. However, it was very clean and fairly fresh, so it has turned out into quite a presentable specimen. The only occasion on which I ever saw this

species alive in Norfolk or Suffolk was in the late summer of 1877, when several visited the Aldeburgh meres, and at least four were shot, two of which we still have here. On Oct. 8th, 1902, Mr. Hudson, the Ipswich birdstuffer, shot an adult male on the Orwell, near Ipswich, which I saw in his shop soon after he had set it up.—JULIAN G. TUCK (Tostock Rectory, Bury St. Edmunds).

Birds Nesting within other Birds' Nests.—Instances such as are given in 'The Zoologist' (*ante*, p. 33) would no doubt prove almost inexhaustible. From my notes, taken within the county of Bedfordshire, the following additional instances might be added:—Hobby in Crow; Tawny Owl in Magpie; Barn-Owl in Jackdaw; Long-eared Owl in Crow and in Squirrel's drey; Spotted Flycatcher in Pied Wagtail, the nest built in the side of straw-rick, and again in Thrush's nest built at the side of a tree; Redstart in Green Woodpecker's hole; Great Tit in excavation by Kingfisher; Common Sparrow and Tree-Sparrow in Magpie; Starling in Magpie; Cuckoo and Wagtail in Thrush; Wren in Swallow and Common Sparrow; Stock-Dove frequently in Magpie; Wryneck in Sand-Martin; Turtle-Dove on Thrush's nest in elderberry-bush; Moorhen on Ring-Dove; Coot within Coot on Moorhen; Red-legged Partridge in Pheasant. In Warwickshire, Sparrow-Hawk in Crow; Long-eared Owl in Magpie; Stock-Dove on Thrush's nest in a spruce-fir tree; Turtle-Dove on Squirrel's drey.—J. STEELE-ELLIOTT (Dowles Manor, Bewdley).

"The Singing Haunts and Habits of some British Birds" (Zool. 1904, p. 445).—The above notes remind me of a very pretty and interesting circumstance that occurred and was witnessed by a few members of the Bradford Naturalists' Society whilst on a ramble in Upper Wharfedale in July, 1903. A Sky-Lark had young ones just out of nest; on the old bird returning and feeding them, it remained on the ground close to the fledglings, and broke out into full song, which it continued for about a minute. At the time it was noted there was a query passed round as to whether the young birds thus early acquired the true wild song of the parent bird.—W. H. PARKIN (Studholme, Shipley, Yorks).

Autumn Song of Birds.—In 'The Zoologist' (*ante*, p. 32), Mr. Gyngell states that, in his opinion, the only birds which renew their full song in autumn after being silent in summer are the Robin and the Starling. In this district the Dipper is quite as much an autumn songster as either of the above mentioned birds. Its singing season is very similar to that of the Robin. After being songless for about

seven weeks it resumes its full song about the middle of August, and continues singing through the autumn.—E. A. SWAINSON (Woodside, Brecon).

Notes from Suffolk.—On Dec. 29th, 1904, a Stone-Curlew, in very good plumage and condition, was brought into Bury from Walsham-le-Willows, an unusually late occurrence for this bird, which is generally only a summer migrant. I should have liked to secure it for a correspondent who lives many miles away from the haunts of the Stone-Curlew, but the owner had decided to “have it stuffed.” On Jan. 3rd a neighbour sent me an unlucky Tawny Owl, with the following account of its misadventure:—“At one o’clock to-day, when the drawing-room fire was being made up, an Owl fell down the chimney on to the fire. Some soot came down with it; the Owl had evidently been suffocated by the smoke. I send the Owl to you; do you think it is worth mounting? Why it should have got into a perfectly new chimney and small chimney-pot, I can’t think.” Though rather soot-begrimed, it was not injured by the fire; but as no one here kills Owls, and we like to hear their wild hooting at night, its death was much regretted. The man by whom it was sent, who has worked on the property for years, told me that it was not the first time such an occurrence had happened, and that one morning, when a wing of the house was opened, an Owl, which had evidently come down the chimney, flew straight through the glass of one of the windows.—JULIAN G. TUCK (Tostock Rectory, Bury St. Edmunds).

Zoological Notes from Scarborough during 1904.—

MAMMALIA.

PIGMY SHREW (*Sorex minutus*).—A dead specimen was brought to me on April 30th, having been picked up on the Whitby moors. This is the only example of this species I have seen taken in the Scarborough district.

RAT-TAILED OPOSSUM (*Didelphys murina*).—One of these charming little animals was brought to me alive on May 11th by a railway rullyman, who had caught it while unloading a truck of cases of bananas, in one of which it had doubtless travelled. It speedily became very tame, and lived for six months, feeding chiefly upon bananas, small fish, and insects. Upon its death, which occurred quite suddenly, I sent the body to the Zoological Gardens, where it was identified by Mr. Pocock as above. It is a native of Brazil, Guiana, and neighbouring South American countries, and is recorded from Central Mexico.

HEDGEHOG (*Erinaceus europæus*).—A handsome adult albino, with pink eyes and milk-white spines and hair, was taken alive near Scarborough last September. It is now being kept alive by its owner.

BELUGA (*Delphinapterus leucas*).—A "White Whale," which was seen by a large number of persons from the Marine Drive, now in course of construction round the Castle Hill, on Nov. 5th, was almost certainly of this species. It was within sixty yards of the wall—so close that its respiration could be plainly heard. In length it was variously described as from 20 ft. to 30 ft., and about 6 ft. in breadth across the back. It had no dorsal fin, had a blunt nose, and was



RAT-TAILED OPOSSUM (*Didelphys murina*).

milk-white in colour all over. It was proceeding leisurely northwards, and was last seen about one mile out to sea, off Scalby Ness, later in the same day.

AVES.

WHITE-FRONTED GOOSE (*Anser albifrons*).—A flock of eleven, mostly immature birds, seen near Malton the first week in January, 1904.

GREAT GREY SHRIKE (*Lanius excubitor*).—One perched upon the telegraph-wires by railway side between Levisham and Goathland, April 4th.

SHOVELER (*Spatula clypeata*).—Six adult males and two females were seen near Malton on April 13th.

CANADA GOOSE (*Bernicla canadensis*).—One at Scalby Ness on May 22nd.

BRENT GOOSE (*B. brenta*).—One shot in North Bay on May 24th, and brought to me in the flesh.

MERLIN (*Falco aesalon*).—An adult female with the hatching-spot well developed was post-trapped on May 23rd, on the moors near Scarborough.

GREAT SKUA (*Stercorarius catarrhactes*).—A specimen was shot near Robin Hood's Bay on June 29th, and brought to a Scarborough dealer.

LEVANTINE SHEARWATER (*Puffinus yelkouanus*).—An adult female was shot at Scarborough on Sept. 17th. Another, an immature bird, was killed on the 27th of the same month. Both examples were shot from boats a little distance out at sea, and were brought to me in the flesh.

SOOTY SHEARWATER (*P. griseus*).—A specimen, of which the sex was indistinguishable, was shot from a boat on Oct. 1st. Another, a female, was obtained on Oct. 4th. I had both birds in the flesh.

EGYPTIAN GOOSE (*Chenalopex aegyptiaca*).—An immature bird was shot at Hunmanby on Oct. 3rd, and sent to me in the flesh.

GOLDEN EAGLE (*Aquila chrysaëtus*).—A friend rescued a fine specimen from the museum of a Sutherlandshire gamekeeper, and sent it to me in the flesh on Nov. 16th. It is now in the Carlisle Museum.

HOUSE-SPARROW (*Passer domesticus*).—A dull white variety was seen to fall dead on Nov. 16th, and was brought to me in the flesh. Dissection showed that it had burst a blood-vessel in the brain. The eyes were black.

ICELAND GULL (*Larus leucopterus*).—An immature bird in the cream-coloured plumage, seen by myself at Cloughton Wyke on Nov. 27th.

PACIFIC EIDER (*Somateria v-nigrum*).—A fine adult male specimen in full plumage was shot in the Orkneys on Dec. 14th, and was sent to me in the flesh. This is, I believe, the first British record for this species. The specimen is now in the Oldham Museum.

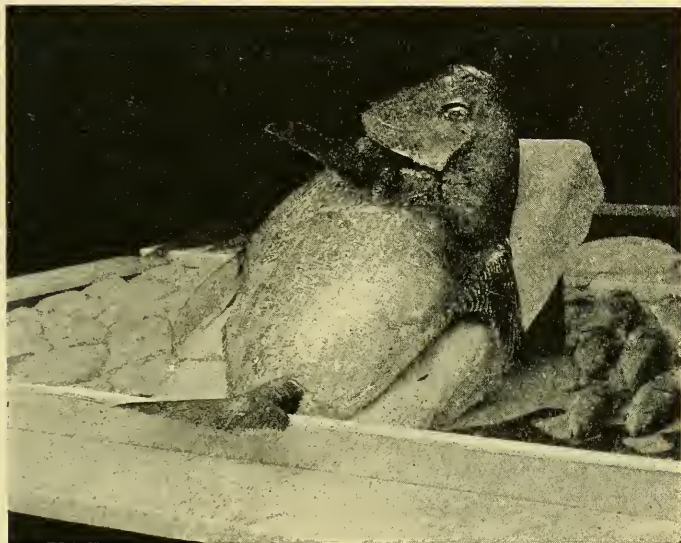
PISCES.

MONTAGU'S SUCKER (*Liparis montagu*).—I found two specimens adhering to the under surface of stones near low-water mark in the South Bay on Feb. 24th. On March 6th I found two others in similar situations in the North Bay.

HAGFISH (*Myxine glutinosa*).—A specimen 17½ in. in length, taken in the trawl in thirty fathoms of water off Scarborough, on April 19th.

ОРАН (*Lampris luna*).—A specimen, weighing 7 stones, 3 ft. 9 in. long, and 4 ft. 2 in. in girth, was exhibited in a local fishmonger's shop on July 6th. It had been taken in the trawl, about twenty miles out from Hartlepool, and was eventually cut up and eaten.

POBBEAGLE (*Lamna cornubica*).—On July 23rd an example of this handsome Shark, measuring about 8 ft. in length, was exhibited upon



ОРАН (*Lampris luna*).

the South Sands. It had become entangled in the Herring-nets about ten miles out from Scarborough the same morning.

БАСЕ (*Labrax lupus*).—One, about 18 in. in length, was taken upon a line on Dec. 29th, and brought alive to me. This species is rare here, this being the third specimen I have seen taken locally.—W. J. CLARKE (44, Huntriss Row, Scarborough).

THE ZOOLOGICAL SOCIETY'S GARDENS.

MONKEYS and Lemurs of various kinds constitute a large percentage of the mammals received at the Zoological Gardens during January. The most interesting amongst the former are two members of the South American Platyrrhine group, a Coppery Teetee (new to the collection), and a white-throated Capuchin. On account of the notorious unwillingness of sportsmen to shoot Monkeys, living specimens of these animals have a special value. Several new species, indeed, in the past have been based upon examples exhibited in our own and other menageries. There is also a very great deal to be learnt about the Lemurs. Some of the species vary to such an extent in colour, both individually and sexually, that the number of existing forms is at present quite unknown; and it is becoming a common occurrence for us to receive specimens which cannot be named with certainty. This is the case with two of the recent acquisitions, which up to the present have baffled identification. Like Monkeys, when young, Lemurs make most attractive pets. Hence far more specimens find their way to the Zoological Gardens than to our National Museum; and, since the skins and skulls of specimens that die are now being preserved, it is to be hoped that ere long some of the difficulties that beset the determination of the species of this group may be cleared up.

More interesting to the general public will be:—(1) a young male Ethiopian Wart Hog, which will take the place of the old Boar that died in January, 1904, leaving the Society with a single sow as the representative of this remarkable African Pig, a genus to which additional importance has lately been added by the discovery of the recently described type *Hylocharus*, connecting the Wart Hogs (*Phacocharus*) with the rest of the *Suidæ*; (2) a Prongbuck, which, although with abnormal horns, is in fine condition, and displays to perfection the coloration characteristic of this species, which amongst hollow-horned ruminants is unique with respect to the shedding of the horn-sheath; and (3) a pair of black-and-tan Corsican Mouflon, which may be advantageously compared with the Society's Sardinian specimens of that animal.

The most important birds are a series of Pheasants, including Japanese, Amherst, Siamese, and Swinhoe's; Horned and Temminck's

Tragopans, Manchurian Crassoptilons, and Peacock Pheasants ; also a pair of Vulturine Guinea Fowls. These, with a cock and two hens of the Jungle Fowl (*Gallus bankiva*), the wild species whence our domestic varieties of poultry have been derived by selective breeding, bring the stock of gallinaceous birds up to the standard, and give promise, granted favourable weather, of better results in the way of breeding than have been achieved for many years in the Gardens.

R. I. P.

O B I T U A R Y.

WE regret to record the death of CHARLES GOLDING BARRETT, who was born at Colyton, Devon, on May 5th, 1836, and passed away on the 11th of last December. Mr. Barrett was a well-known British lepidopterist, and contributed a number of notes on his favourite study to 'The Zoologist' in the late fifties and early sixties of the last century. His principal publication is a series of volumes—alas ! unfinished—on 'The Lepidoptera of the British Islands,' a work remarkable by the wealth of recorded observations on the life-histories of these insects. He was a most amiable and unobtrusive man, sincerely attached to his study, which he loved for its own sake, and consequently derived a real pleasure from it.

NOTICES OF NEW BOOKS.

Wanderings in the Great Forests of Borneo; Travels and Researches of a Naturalist in Sarawak. By ODOARDO BECCARI. Translated by Dr. ENRICO H. GIGLIOLI. Revised and edited by F. H. H. GUILLEMARD. A. Constable & Co.

ITALY has divided with England the roll-call of naturalists who have visited the glorious islands of the Malayan Archipelago; in addition to the name of Dr. Beccari, those of D'Albertis, Doria, Fea, and Modigliani are household words to those who have studied Malayan zoology. Dr. Beccari is a little late with his narrative, for his travels in Borneo were undertaken in the years 1865-68, but the vivid impressions then derived are not easily effaced, as the writer of this notice, who spent almost the identical years in the Malayan Peninsula, can readily testify. There is room for many more books by naturalist observers on these tropical islands—their story is still far from being told; but the large zoological collections already received from them has somewhat discounted the financial support which the ordinary traveller requires; while many explorers have neither published their notes nor impressions, and in this respect we feel how much was buried with the late accomplished William Doherty.

Of the Orang-utan, *Simia satyrus*, as we still venture to call the species, Dr. Beccari has much to tell. "There are big Orangs with a wide face and lateral cheek-expansions, and smaller Orangs without such expansions; some have short, others have long hair, and thus at least two or three kinds may be distinguished." But our author takes the conservative view, and has come to the conclusion that it is rare to meet with two specimens of this animal perfectly alike, even when of the same age and sex, and belonging to the same race, and holds that only one species of Orang-utan exists—the *Simia satyrus*, of which he distinguishes two main varieties, retaining for them the native names of "Tjaping" and "Kassa." Reference is also made to the frequently repeated story of shore-birds entering

the widely opened mouths of sleeping Crocodiles to search for any small fry that may be concealed therein. Dr. Beccari writes:—"Indeed, if I remember right, I have witnessed the thing myself; but now as I write I cannot feel quite sure that it was not one of the many stories told by my men." In a footnote, Dr. Guillemard says he has heard the same report in Celebes, and the writer of this notice was told the same thing by Malays in Province Wellesley.*

Dr. Beccari formulates his own views on the evolution of species; these when coming from an experienced naturalist always demand consideration, if not acceptance, and in days when theories are frequently advanced as dogmas a variant view is a healthy sign. The main conception of evolution does not rest on current opinion as to some of its manifestations. The book is well and amply illustrated, and is a valuable addition to Malayan literature.

A Synonymic Catalogue of Orthoptera. By W. F. KIRBY. Vol. I. (*Forficulidæ, Hemimeridæ, Blattidæ, Mantidæ, Phasmidæ*). Printed by order of the Trustees of the British Museum.

BOTH the authorities of the British Museum and Mr. Kirby are to be congratulated on the production of this volume. It supplies a very distinct want, and the author is *facile princeps* in the construction of entomological catalogues. The help afforded to students of the Orthoptera by such a list is very great, and we trust that Mr. Kirby will soon provide another volume on the subject.

* F. Vaughan Kirby, in his 'Sport in East Central Africa,' states that he has personally observed the Spur-winged Plovers acting as "tooth-picks" to sleeping Crocodiles near Chinde (*cf. Zool.* 1899, p. 331).

EDITORIAL GLEANINGS.

Heavy Fresh-water Fish taken in 1904.—A 16 lb. Trout was captured in the Test at Romsey, Hampshire, one of 16 lb. was landed on Lough Mask, the Itchen yielded a Trout of 11 lb. 6 oz., the Colne (Rickmansworth) one of 8 lb. 1 oz., a big Rainbow of 9 lb. 1 oz. was taken on a fly in a private lake near Bath, and an 8 lb. 5 oz. Trout was secured in the Thames at Shepperton. A magnificent specimen of the Great Lake Trout (12 lb.) was also caught in Loch Rannoch, Scotland, in July. An English river—the Hampshire Avon—has furnished one of the heaviest Salmon—a 45-pounder. A 33 lb. Pike has been recorded from Lough Conn, and one of 26 lb. from the Sussex Arun. A 17½ lb. Carp has been captured in the Home Park, Hampton Court, a 13¼ lb. Carp in the Brue (Somersetshire), Chub of 7 lb. 5 oz. and 7 lb. 14 oz. (killed by an Otter) in the Avon at Christchurch, two Perch of 4¼ lb. and 4 lb. (entrusted to Messrs. Eaton and Deller for preservation), and a Dace of 1 lb. 2 oz. in the Herts Beane. A Roach of 3 lb. was reported taken in the Medway (Kent); one of 3 lb. 4 oz. was found in a dying condition in the Marlow district of the Thames; and while a reservoir near Bristol was being cleaned out what is known as the “Record Roach” was met with. It scaled 3 lb. 10½ oz.—*Angler's News, Jan. 7th.*

Marine Zoology in the East Riding, 1904.—The following have been taken on the Holderness coast during 1904. In the fishing-cobles at Hornsea, May 28th—Crustacea: *Hoplonyx cicada* (Fabr.); *Callisoma hopei*, A. Costa; *Idotea marina* (Linn.); *I. linearis* (Penn.); *Jæva albifrons*, Leach; *Hippolyte varians* (Leach). In Crab-pots, Hornsea, Aug. 8th: *Polynoë imbricata*, Linn.; *Pedicellina cernua* (Pall.), on Whelk-shells, and *Phoxichilus spinosus* (Mont.); with the Mollusca, *Lacuna crassior* (Mont.), common; *L. pallidula* (da Costa); *Cingula semistriata* (Mont.), abundant. *Modiolaria discors* (Linn.) was washed up alive at Kilnsea (seaside) on Aug. 6th; several specimens of *Syndosmya alba* (Wood) were found alive on the tide-mark at Aldborough during the same month, and dead specimens of *S. tenuis* (Mont.) were taken on the river-side at Kilnsea. *Eurydice pulchra*, Leach, from Well Creek, is an addition to the Humber Crustacea; and *Haustorius arenarius* (Slabber), the sand-furrow maker, from Aldborough, adds another species to the East Riding list. The common estuarine Schizopod, *Neomysis vulgaris* (Thompson), was abundant during August in the ditch which forms the western boundary of Westlands, Hedon. T. PETCH (Trans. Hull Scient. and Field Nat. Club, 1904).

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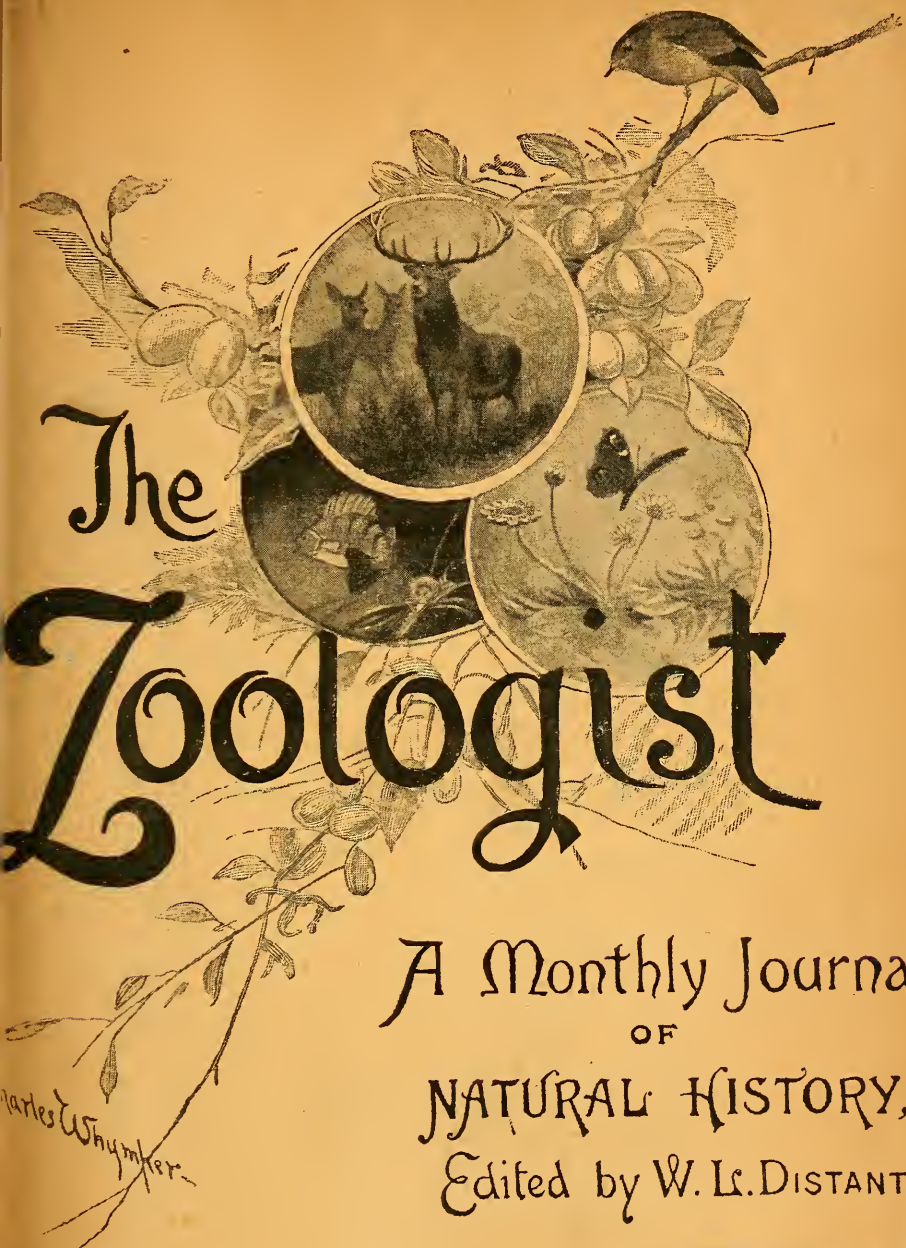
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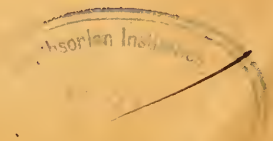
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A GREY HIMALAYAN GORAL (*Urotragus bedfordi*), formerly living in Woburn Park. Photographed by the Duchess of Bedford.

THE ZOOLOGIST

No. 765.—March, 1905.

THE GORALS OF INDIA AND BURMA.

BY R. LYDEKKER, F.R.S., F.Z.S.

(PLATE I.)

A WELL-KNOWN big-game sportsman, Major G. H. Evans, of the Indian Veterinary Department at Rangoon, has recently forwarded to me a couple of skins of Gorals shot by himself some distance to the westward of Mount Victoria, in the Pakokku district of Upper Burma. In sending these specimens by a friend, he expressed his belief that they indicated an undescribed species, or race. This opinion I am able to endorse, as these skins are certainly very different from those of the typical Himalayan Goral (*Urotragus*, or *Cemas*, goral).

In this, of course, there is nothing surprising, as it is only what we should expect to be the case; but an examination of the skins in the British Museum has also led to the conclusion that there are two perfectly distinct forms of Himalayan Goral, which is certainly an unexpected development.

What I take to be the typical Himalayan Goral, as represented by skins in the British Museum collected by Brian Hodgson during his official residence at Khatmandu, is a rufous brown animal, only slightly paler below than on the back, with the face somewhat lighter and more rufous, but darkening towards the horns; and a white or whitish area on the throat and chin. Along the back, from nape to tail, runs a very conspicuous black

dorsal streak; the tail is wholly black above; and there is a blackish stripe down the front of the legs, which are elsewhere brown.

In the 'Fauna of British India' Mr. Blanford makes no mention of any colour-variation according to season, age, or sex; but Mr. Sterndale, in his work on the Mammals of India, states that the does and young are lighter-coloured than old bucks. On the other hand, General MacIntyre, in his 'Hindu-Koh,' states that the doe is like the buck in appearance, except for her thinner horns. He describes the colour as uniform greyish brown, with a white throat-patch.

At least three skins in the Hodgson collection conform to the above-mentioned brown type; but a fourth skin, with part of the skull, in the same collection, which appears to represent a fully adult animal, differs by its decidedly greyish fawn colour, the absence of a distinct dark dorsal stripe, and in certain other details. On the evidence of this one specimen I should have had considerable hesitation in admitting the existence of two forms of Himalayan Goral. The British Museum possesses, however, a mounted Goral skin, presented in 1897 by the Duke of Bedford, which belonged to an animal formerly living in His Grace's park at Woburn, and believed to be of Himalayan origin. This specimen agrees precisely with the one last mentioned. Its general colour is light yellowish grey-fawn, suffused with blackish; the white throat-patch extends largely on to the cheeks; there is no dorsal stripe; the muzzle has a dark median streak extending to the level of the eyes; the tail is blackish only at the base; and the fore legs have only a blackish "knee-cap," and the hind pair are wholly rufous fawn. In addition to these striking differences of colour, the ears of this Goral are larger than in the typical Brown Goral, and the horns are more curved and rougher. Like the grey skin in the Hodgson collection, the Duke of Bedford's specimen seems certainly to be adult, and is apparently a male. I cannot think the differences between this form and the typical Goral can be explained by season, sex, or age.

If this be so, we must assume either that the Himalayan Goral exhibits dimorphism, or that there are two local races or species, which must be presumed to inhabit separate areas or

different zones of altitude. I prefer to adopt the latter view; and I accordingly propose to name the Grey Himalayan Goral *Urotragus bedfordi*, taking the mounted specimen in the British Museum as the type. I may add that in regarding the Brown and the Grey Himalayan Gorals as distinct forms, I have the support of the eminent American naturalist, Mr. G. S. Miller, who is at present in this country. Mr. Miller, who agrees with me in regarding the two forms as species instead of races, remarked that the onus of proving them identical rests on those who refuse to admit their distinctness.

Turning now to Major Evans's Burmese specimens, it may be noted in the first place that these resemble the Grey Himalayan Goral in the absence of a black dorsal stripe, but differ by the general colour being a more brownish grey, heavily suffused with chocolate-brown; while there is no white on the cheeks, no dark mark on the upper surface of the muzzle, and the throat-patch is yellowish. The tail is blackish brown throughout; and the legs are coloured exactly the reverse of those of the typical Goral, being dark brown behind and rufous fawn in front. The horns are very small, nearly straight, and almost smooth.

This Goral I propose to name, after its discoverer, *Urotragus evansi*; and I hope that Major Evans may be induced to present the two type skins to the British Museum.

The three forms of Goral discussed above may be briefly diagnosed as follows:—

1. *Urotragus goral*.—Colour rufous brown, with a white patch on the throat and chin, a black dorsal stripe and tail, and a black stripe down the front of each leg. Horns comparatively straight, and not heavily ringed. Eastern Himalaya.

2. *Urotragus bedfordi* (Plate I).—Colour yellowish grey-fawn suffused with blackish, the light throat-patch pure white and extending on to the cheeks, no distinct dorsal stripe, a dark streak on muzzle; base of tail and knees blackish, the rest of the legs being fawn. Horns more curved and more heavily ringed than in the last. Western (and in part? Eastern) Himalaya.

3. *Urotragus evansi*.—Colour brownish grey-fawn suffused with brown; throat-patch small and yellow; no stripe on muzzle or back; tail and back of legs dark brown, rest of legs rufous fawn. Horns very small. Upper Burma.

It may be added that the Goral figured in my 'Great and Small Game of India,' &c. (Rowland Ward), is *U. bedfordi*. In colour this animal accords in some respects with the description of *U. griseus* of Eastern Tibet; but the wide separation of the two forms may be regarded as sufficient evidence of their distinctness.

To determine the respective habitats of the two Himalayan Gorals must in part be left to others. Judging from its dark colour, I should be inclined to regard the brown species (*U. goral*) as a native of the damp forests of the Terai, and the grey *U. bedfordi* as an inhabitant of drier and colder forests. So far as my recollection carries, the Kashmir Goral is the grey type; and the description given by General MacIntyre would seem to indicate that he had to do with the same type of animal in Kumaon. This is confirmed by the fact that there is living at the present time in the London Zoological Gardens a specimen of *Urotragus bedfordi* from Chamba, presented in the summer of last year by Major Rodon. It therefore seems clear that the Grey Goral is the Eastern type; but it is possible that it may also range into part of the Nepal area.

ORNITHOLOGICAL NOTES FROM NORFOLK, 1904.

BY J. H. GURNEY, F.Z.S.

(Assisted by several local Naturalists.)

A PROBLEM in East Anglian ornithology—one may say, in British ornithology—which must impress itself upon naturalists, and which is very difficult of solution, is the not infrequent presence in mid-winter (*i. e.* the months of December and January) of quite southern species; species, that is to say, like the Little Bustard and Serin Finch, whose breeding area lies a long way to the south of England, and whose proper winter quarters are the shores of the Mediterranean or Africa. Why such birds should be on our coast at such a time is a point for consideration, and one not easy of solution.

I am led to these remarks because, during January, 1904, no fewer than three such occurrences took place, *viz.* the Red-crested Ducks, the Citril Finch, and the Avocet. A short list may here be given—merely taking Norfolk and Suffolk—of former mid-winter visitations, which, if the last fortnight in November and the first fortnight in February were included, would be considerably extended. These waifs and strays are in all likelihood derived from the east of Russia, if not from Asia, and their presence in the British Isles can be ascribed to gales in Russia.

Red-breasted Flycatcher	...	December 12th, 1896.
Serin Finch	.....	January 31st, 1887.
Citril Finch	.....	January 29th, 1904.
Cirl-Bunting	.....	Four examples in Dec. or Jan.
Great Bustard	.....	Two or three " "
Little Bustard	.....	Six or seven " "
Avocet	.....	January 1st, 1904.
Allen's Gallinule	.....	January 1st, 1902.
Red-crested Duck	.....	Four or five examples.
Nyroca Duck	.....	Several examples.
Mediterranean Black-headed Gull	.....	December 26th, 1886.

These are ten rare species, and the Cirl-Bunting, which, when they do come, are to be expected in the spring or autumn; certainly not in the depth of winter.

The migrations of all birds, or rather, one should say, their intended migrations, if not carried elsewhere by wind, are to a colder land—*i. e.* to the north—in spring, and to a warmer land—*i. e.* to the south—in autumn. Surely birds can scarcely be led by instinct, of their own accord, to migrate from the east of Europe to the west at any period of the year. Such a flight, though it may often take place, can hardly be a voluntary one on their part, or undertaken by them in order to escape the rigours of a coming winter. Still less is it probable, long after winter has set in, as in the cases which have been mentioned (Red-breasted Flycatcher, Serin Finch, Red-crested Duck, &c.). It is true that England is somewhat more temperate than is the same latitude in Eastern Russia, but the difference is not very great. We may assume that certain birds—*e. g.* the Red-crested Pochard and Nyroca Duck—come to us from the Volga provinces, more especially Orenberg, Ufa, and Samara, or near there, between lat. 50° and 55° ; but, according to different authorities, the winters are not colder there than in England.

The twelve months which have just elapsed have perhaps not been, ornithologically, very eventful ones for Norfolk, yet there is always something to remark. In January there was the winter flight of Woodcocks, which often comes at or before Christmas, but the great month is November, when more come than in October. There was no weather hard enough to bring Wildfowl, and spring soon began to assert itself. Thrushes were singing on Feb. 7th at Brunstead, but it was some time before Wood-Pigeons began to coo and Snipe to drum (Rev. M. C. Bird): On April 2nd, Mr. W. G. Clarke found the well-known “Ringmere”—a large pond near Thetford—full of water, with three Ducks, believed to be Garganey Teal, on it; while on the small lake between “Ringmere” and “Langmere” he saw two Gadwall and four Garganeys (?). On “Langmere” itself there were seven Garganeys or Teal, and on “Foulmere” a number of Ducks which could not be identified.

The frequent presence of Spoonbills on Breydon (tidal) Broad during the spring, from April 18th to July, is due entirely to the protection afforded them by the "Breydon Wild Birds Protection Society"; and it is to be hoped the subscriptions to this useful institution will not fall off. It has been carrying on its work since 1887, but for most of that time with very meagre support.

Looking through the back volumes of 'The Zoologist,' it appears that in registering the visits of Spoonbills to Breydon Broad the wind has been noted in sixty-seven cases, and this seems almost enough to generalize upon. Forty Spoonbills, including two flocks, are considered to have arrived with a north-east wind, nineteen with a west wind, two with an east wind, two with a north wind, two with a south wind, and two with a south-west wind. It is natural to infer that the wind which brings the Spoonbill will be the wind for many other birds on their spring migration; yet north-east winds certainly do not, as a rule, bring birds from the south, though it is likely enough that they cause them to halt a while. Probably Breydon Spoonbills come from the east rather than from the south, *viz.* from a settlement in Holland, where, in 1898, Dr. P. L. Selater found, in a strictly protected place, about three hundred pairs ('Ibis,' 1899, p. 124).

During July we had two or three of the hottest days I ever remember. The 15th and 16th were extremely hot. Barley looked bad, but hay on my side of Norwich averaged nearly $1\frac{1}{4}$ ton an acre. This was a period of drought, and the atmosphere became charged with electricity, which culminated in a downpour on the 27th such as I never remember. I registered 2.95 in. of rain at Keswick, the greater part of which fell in two hours.

Short-eared Owls bred near Hickling (M. Bird), Greater Spotted Woodpeckers at Felbrigge (Davey), Goldfinches at Northrepps, Redpolls at Southacre (Daubeny), Woodcocks at Ranworth and Quidenham (Lord Albemarle), Sheld-Ducks at Blakeney, and for the tenth time, if not longer, Kingfishers occupied the same hole, and that beside a frequented path, on a stream near Aylsham (Buxton). An extraordinarily elongated Hedge-Accentor's egg, † 1.05 in. in length, was found at Catton, with others

of the normal shape, and some blue Partridge's eggs,† at Swardeston, of quite a bright tint.

On May 23rd a Cuckoo's egg was detected in a Hedge-Accentor's nest at Keswick, which will form the subject of another communication; and the following month a young Cuckoo was met with by Major Dods on Salthouse Heath in a Stonechat's nest, the first instance of that species being the Cuckoo's host in this county. Four of the Stonechat's eggs were resting on the rim of the nest when found on June 8th by Mr. Dods.

On June 22nd my daughter and I were shown a Nightjar covering two young ones at Hevingham, and so oblivious to danger that five of us stood round the nest without her moving. Indeed, she did not so much as open an eye, and this is a habit which greatly helps in rendering this grey bird inconspicuous. The keeper said the young had been hatched on the 20th (two days previously), and moved since about three feet. Although I have never known young Nightjars to be found which were not moved subsequently—once, at least—I never met a gamekeeper who knew how it was done. It is certain that these youngsters very early acquire the power of walking, or rather crawling, unaided, but when only two days old it must surely be in the parent's mouth that they are carried. Mr. F. Norgate, a most observant naturalist, told me he believed he had seen it done, but the bird was past him so quick that it was difficult to be certain, but it undoubtedly had something in its mouth.

Returning now to the subject of migration, an arrival of the migratory *Passeres* was noted on the coast of Norfolk by Mr. E. C. Arnold and his brother on Sept. 13th (S. to S.W., fine), but, save for that, there was little migration observed during 1904. Nor am I informed of any marked arrivals or departures of *Corvidæ*; indeed, my correspondent, Mr. B. Dye, remarks of the Yarmouth district that Rooks were less numerous than for many seasons, and that is a district where a good many are nearly always observed.

Each year practically the same number of birds of passage come and go, but it depends on the wind whether they are noticed or not. If no adverse winds delay them they pass on rapidly, for the most part at night, and no one is any the wiser.

In 1904 we had a great wave ; in 1905 little or nothing was seen. I often think if the rarities which are identified on the projecting coast of Norfolk by day could be exchanged for those which pass unidentified by night, what a far greater number of them there would be.

October was a very fine month, and therefore blank. November was principally noticeable for the presence of a Flamingo, which may have escaped, but it neither belonged to the Duke of Bedford nor to Mr. W. H. St. Quintin, who keep these birds in their parks. Lapland Buntings were also more in evidence than they have been since 1892, though, indeed, they are annual visitors.

December set in rainy and unsettled. On the night of the 16th we had 16° of frost, followed by a thick fog which lasted for several days. Early one morning an incident happened which is not unusual on misty nights. A great flock of Starlings which had lost their way settled on the roof and lantern-gallery of Happsburgh lighthouse, where, bewildered by its light shining through the mist, they stayed from one a.m. until daybreak (J. Gentry). It was the largest number of Starlings the principal had ever seen during an experience of over thirty years. On another night he secured a few Wigeon and Plover.

Mr. A. Patterson sends another anecdote of the same nature, which can be related here. One drizzly night in October (D. U.) four Woodcocks struck the lantern of the 'Leman and Ower' light-vessel, and, falling on deck, were all secured. On four other occasions single Woodcocks had struck, always making for the white and not the red light. Mr. Patterson also writes of a Dabchick which came on board a fishing-boat some forty miles from land on Oct. 12th, and, striking against the cook's "galley," was forthwith taken ; and of a Buzzard which visited one of the light-vessels.

The birds deserving to be called rarities during 1904 have been:—January : Sea-Eagle, two Red-crested Ducks (Suffolk), Citril Finch. February : Black Redstart. April : Serin Finch. May : Two Avocets, seven Spoonbills. September : Pectoral Sandpiper (Suffolk), Aquatic Warbler, Ortolan, Red-breasted Flycatcher. October : Four Lapland Buntings. November : Five Lapland Buntings, Flamingo (?).

A good many occurrences of birds are often notified to the

recorder of these annual Notes by friends without exact dates; the month if not the week of capture is always remembered by the observer, but not the day. It is proposed to enter such occurrences as nearly as they can be allocated with the letters D. U. (=date uncertain) after them, to show that the exact date is not known. As before, a dagger (†) signifies that the bird has been seen by the recorder, and that he is responsible for its identification.

The direction and force of the wind have been generally taken from the Daily Weather Report for Yarmouth, issued at the Meteorological Office.

JANUARY.

1st.—A flock of about twenty-five Golden Plover† at Swains-thorpe, a favourite resort of this species.

2nd.—Sharp frost. A young Sea-Eagle seen at Hoveton by Mr. F. H. Barclay, as usual, mobbed by Rooks when it rose from the field in which it was at first seen standing.

13th.—A Merlin, caught at Keswick by a birdcatcher, having, I suppose, swooped at the "call-bird."

14th.—Some Pochards and Tufted Ducks at Hempstead ponds (Barclay).

15th.—W., 5. Seven Goosanders at Hickling (M. C. Bird), and shortly afterwards a female shot on Breydon (B. Dye).

16th.—W.N.W., 5, at Yarmouth. Male and female Red-crested Pochards,† in perfect plumage, and perhaps already paired, as there were no others, shot at Thorpe Mere by the sea, in Suffolk, by Mr. F. G. Garrett, and sent to Mr. Gunn, of Norwich, for preservation (recorded, Bulletin B.O.C. xiv. p. 62). As already remarked, this southern Duck has generally chosen the winter in which to visit the east of England, contrary to what one might expect. A few are stated to breed in Central Germany, from whence perhaps these birds come, or from further east; they seem to have made the shores of England with a high wind from the west.

20th.—A Sea-Eagle seen at Ipswich, mobbed by a Rook ('Field'), probably the same seen in Norfolk on the 2nd.

21st.—W., 4. A cock Black Redstart, taken on Yarmouth denes by a birdcatcher, and brought to Mr. W. Lowne, who successfully caged and moulted the bird, and with it subsequently

won first prize at the Crystal Palace, first at Norwich, and first at Yarmouth Bird Shows.

27th.—S. S. W., 6.

28th.—S. S. W., 5, at Yarmouth.

29th.—S. W., 3. A Citril Finch,† *Chrysomitris citrinella* (L.)—an adult female in good feather—taken with an ordinary call-bird by J. Quinton, one of our Yarmouth birdcatchers, who generally plies his trade on the denes. I am indebted to Mr. E. C. Saunders for a knowledge of this rarity, which is now in his possession. It is just possible it may be an escaped one, but it must be remembered how many rare migrants follow the eastern coast-line. The Citril Finch is stated to be fairly common in Baden, which is only three hundred miles away, a distance a bird may easily cover in a strong gale of wind such as blew on the 27th from S. S. W.: Gätke quotes two occurrences for Heligoland. An Eagle seen at Hickling (Bird), perhaps the same one seen on Jan. 2nd and 20th.

FEBRUARY.

21st.—Mr. W. G. Clarke saw a Black Redstart on the Dereham Road near Norwich.

23rd.—Some Wild Swans, Wild Geese, and Little Auks announced on the coast (H. Pashley).

26th.—Bittern on the Broads (Bird).

MARCH.

10th.—Wheatear near Thetford (W. G. Clarke).

12th.—Wryneck near Thetford (Clarke).

14th.—Norfolk Plover near Thetford (Clarke).

24th.—Hoopoe seen at North Walsham (Bird).

31st.—Three Yellow Wagtails at Horsey (Bird). Sixteen Dotterel seen at Feltwell by Mr. Newcome (D. U.).

APRIL.

2nd.—Chiffchaff near Thetford.

18th.—E. S. E., 3. The first Spoonbill appeared on Breydon (tidal) Broad a week later than the first one in 1903, and was bullied by Gulls as if it had been their worst enemy (Patterson). It was seen off and on by Mr. Jary, the Society's watcher, until April 28th, when it was joined by another. Subsequent notes

on Breydon Spoonbills are all supplied by Jary, who has used the utmost vigilance in keeping off the fraternity of gunners.

23rd.—Dunlins assuming black breasts (Patterson).

25th.—Grasshopper-Warbler heard (E. C. Saunders).

27th.—S., 3, at Yarmouth.

28th.—W.N.W., 4. The Spoonbill on Breydon joined by another. A cock Serin Finch netted at or near Yarmouth, and subsequently kept alive by Mr. Lowne for some weeks. This is the fourth, if not the sixth, Serin which has been taken there by birdcatchers, and it seems as if a few annually followed our coast-line; yet none have been identified at Blakeney, a place which seems equally suitable with Yarmouth denes. Another migrant on this day, of a kindred sort, was a hen Black Redstart, which attracted attention by perching on Cley coast-guard-house (Pashley), where I remember a pair on a previous occasion.

MAY.

1st.—W., veering to S.E. Two Spoonbills again on Breydon. Several Grasshopper-Warblers "trilling" round Calthorpe Broad (D. U.) (R. Gurney), and a Ring-Ouzel seen at Twyford (Hamond).

4th.—Shown a Woodcock's nest with two eggs,† taken by Ranworth Broad on marshy ground (D. U.). As usual, the bird sat close, so that the gamekeeper almost put his foot upon her, and in rising either she or he broke one of the eggs.

5th.—Cormorant at Hoveton (Davies).

8th.—S.E., 3. The two Spoonbills on Breydon are evidently the same which have been there off and on since April 28th.

9th.—W., 4, fine. An Avocet and three Spoonbills seen by George Jary, the watcher, on Breydon muds. Only one of these Spoonbills is a fresh comer.

10th.—N.W., 1, fine. Lots of birds on Breydon muds.

11th.—N.E., 2, at Yarmouth in the afternoon; N.N.W., 3, in the morning; N.W., 3, the evening before. In response to a telegram from the watcher on Breydon Broad, my daughter and I went over, and had the good fortune to see two Avocets and seven Spoonbills, which, though not very near together, were all in view at the same time, forming, with a few Whimbrel and Herons, a picture worthy the brush of Mr. Southgate, who has done some excellent pictures of Norfolk bird-life. The Avocets

allowed us to approach within about fifty yards, and we watched them preening themselves and afterwards feeding—lovely birds—standing while they did their toilet in some three inches of water. One of them, Mr. Jary said, had only arrived a few hours, which accounted for such elaborate ablutions; the other he had known to be on the Broad two days, having seen it at different times since the afternoon of the 9th. Now and then the new arrival stretched a wing high in air, or turned his head in very graceful way, while the dorsal portion of the plumage was being dressed.



After a while they left the water in which they had been standing, and began to feed on a sand-bank, and once or twice I could catch the sweeping action of the beak from side to side, which has been compared to a man mowing. Jary said he had seen the first Avocet take worms to the water's edge and apparently wash them, but this they did not do while we were there. The Spoonbills we did not get very near to, for when the punt was still four hundred yards away a train put them up. Jary said that one bird had a very fine crest, and was larger than the rest. He was sure that four of them had only arrived that morning

on the muds, and one the day before—of course immediately joining the two already there ; these latter were believed to have been on Breydon Broad since April 28th. The whole party, when on the wing together, produced a very striking effect, their conspicuous whiteness visible at least a mile away, reminding one of Swans or Gannets against a leaden sky.

11th.—Mr. H. Bunn received a male Hobby, which had been caught on a fishing-smack in the North Sea (D. U.), and brought into Lowestoft Harbour.

12th.—Two Spoonbills and two Garganey Teal at Hickling Broad (Nudd). The Spoonbills probably belonged to the flock on Breydon, which is only nine miles away from Hickling, but evidently less suited to its habits.

13th.—The two Avocets and the seven Spoonbills again upon Breydon mud-flats (Jary), but they do not seem to have been there on the 12th ; possibly they were at Blakeney, where, I am assured by a well-known gunner, five were seen one day (D. U.) during this month.

14th.—The two Avocets and seven Spoonbills still on Breydon muds.

15th.—E, fine. The two Avocets and two of the Spoonbills remain on Breydon, but the other five are announced to have left.

16th.—No wind at all. The Avocets are believed by the watcher to have left also.

17th.—W., 4, fine. The pair of Spoonbills on Breydon joined by two more.

23rd.—W., 1. Another Spoonbill has come to Breydon ; stated to be a fine old bird with a good crest.

27th.—The old Spoonbill with the crest, after two or three days' absence, is on Breydon again.

JUNE.

6th.—N.E., 4. There are now four Spoonbills on Breydon Broad, three of them, it is thought, fresh ones. These were the only Spoonbills seen by Jary during June, nor was another detected until July 8th.

17th.—A Spoonbill visited Hickling Broad yesterday and to-day (Bird).

JULY.

4th.—Two Hawfinches at Cromer (Barclay).

6th.—Spoonbill seen at Hickling Broad (Bird).

8th.—E. After an interval of thirty-two days the watcher was able to announce another Spoonbill, apparently a fresh one, on Breydon muds, where it was generally to be seen at low tide until the 10th, when the wind was S.E., and after that it was seen no more, nor were any others seen. Making a fair allowance for the same birds being observed several times over, it is probable that only thirteen individual Spoonbills visited Norfolk during 1904—a nice quantity, but still less than were seen on a single day in 1894.

15th.—A pair of Green Sandpipers at Southacre decoy (E. T. Daubeny). Others are reported to have summered at Kimberley (Bird).

AUGUST.

1st.—Mr. Bird was able to notify a Jack-Snipe, on the authority of Nudd, who is too experienced a keeper to have made a mistake—an uncommonly early arrival. On the same authority, a few days earlier, he notes some Ruffs and Garganey Teal, and a Grasshopper-Warbler's nest with eggs in the Broad district.

9th.—W.N.W., 3. A compact flock of about sixty Whimbrel came in from the sea at Yarmouth; on reaching Breydon Broad they were seen by Mr. Patterson to open out like a fan, but presently recovered their formation and passed on.

10th.—Mr. E. C. Saunders saw a Wood-Sandpiper near Yarmouth.

24th.—Two Ruffs offered in Yarmouth market (B. Dye).

SEPTEMBER.

1st.—N.W. Dunlin, as usual, abundant on the north coast of the county, but Knots later in arriving than last year. The following shore birds were identified to-day by self and friends: Dunlin, two hundred to three hundred; Knot, one; Little Stint, two; Sandpiper, one; Pigmy Curlew, four; Greenshank, two; Redshank, eight; Turnstone, three; Ringed Plover, several; Curlew, one; Oystercatcher, one; Sheld-Duck, two; besides a nice show of Common and Lesser Terns, thanks to protection.

Mr. E. C. Arnold followed a strange Lark with much white in the tail, and a white streak in each wing, suggestive of *Alauda sibirica*. He also saw twelve Pied Flycatchers and one Wryneck, and a Richardson's Skua and some Razorbills.

2nd.—W.N.W., 3. A Pectoral Sandpiper shot at Southwold ('Field'). By this time some very young Razorbills and half-grown Guillemots had, as usual, found their way from Flamborough Head to Norfolk shores, where their tameness is often a source of danger to them. Also some very young Little Gulls perhaps come from some Danish breeding-place—and Richardson's Skuas, another regular visitant, and a few Gannets and Sandwich Terns showed themselves.

5th.—S.E. A further influx of Pied Flycatchers (Arnold).

6th.—Woodcock at Lowestoft (H. Bunn); the earliest. Wind yesterday evening S.E., 6.

11th.—A Land-Rail,† picked up at Northrepps by a little girl; when found, a Rat was biting its neck, from which much blood flowed; there was also a slight abrasion on its head, as if from collision with some tree or wall. The little girl took off the Land-Rail to bury it, but, discovering that it was only shamming death, brought it to me instead. The next morning it did not seem much the worse, and was soon running about the lawn as brisk as ever, but concealed itself when watched. The following day it was half a mile away, and was caught trying to force its way through a wire-gate, which by using its wings it might easily have got over.

13th.—S. to S.W., fine, 4. The beach reported by Mr. E. C. Arnold to be alive in certain places with numbers of small birds of passage, which had come in the night, including many Common Linnets. Also many Redstarts, Sky-Larks, Pipits (one of them thought by Mr. Arnold to be a Richard's Pipit), &c., one Snow-Bunting, one Reed-Bunting, one Ortolan Bunting, but only a single Pied Flycatcher. The Arctic Tern and Scaup-Duck were also identified, and about one hundred Golden Plover.

15th.—N.E., 3. Mr. Lowne took a Pied Flycatcher in a net-trap on the "denes," and, lending it to a birdcatcher, the latter took another with it; others were also seen. On the same day the 'Field' reported an Aquatic Warbler† in Norfolk, and Mr. Pashley had information of a few Bluethroats.

18th.—Lapland Bunting, already recorded by Mr. Aplin (*Zool.* 1904, p. 428).

21st.—E.N.E., 6. Several Wheatears and Mistle-Thrushes on Cromer hills, where few but migrants halt; wind high.

22nd.—E.N.E., 5. Swifts still on the coast (T. E. Gunn), and one Red-breasted Flycatcher (Richards), as well as some more Bluethroats and a Grasshopper-Warbler (Gunn).

24th.—Lapland Bunting, already recorded, as have been other notes from Hunstanton by Mr. Tuck.

OCTOBER.

4th.—A Norfolk Plover,† shot at Blakeney (C. Gurney), an unusual bird there, though I have seen plenty of them at Kelling Heath, whence it had probably come.

10th.—Two Velvet Scoters sent to Mr. Gunn from Wells.

12th.—Smew at Catfield (Bird).

21st.—Black Redstart (female) caught or netted on Yarmouth denes (Lowne).

NOVEMBER.

4th.—A Pomatorhine Skua,† well advanced in plumage, the only one reported this year, was caught off the shore, or from a boat, at Hunstanton, on a hook baited with a piece of candle, which the bird must have been hungry to swallow (Roberts).

5th.—Nine Wild Swans on Foulmere (Clarke), and shortly afterwards (D. U.) three seen at Stratton Strawless. About this time, or later, a Flamingo was seen at Riddlesworth by Prince Duleep Singh and other gentlemen, probably the same which was shot on Nov. 24th at the mouth of the Medway. It may have been a liberated one, but I learn from the Duke of Bedford that it is more than a year since one escaped from Woburn.

21st.—A falling glass. A large flock of Wild Geese—fore-runners of snow—passed over Norwich city very early in the morning—about 1 a.m. (W. G. Clarke).

22nd.—Snow in all parts of the county, in consequence of which a flock of Corn-Buntings sought the softer ground in the vicinity of the sea (Patterson), Wild Swans, including a Bewick's Swan, were heard of near Salthouse (C. Gurney), and a few Little Auks and Wild Geese on the coast (Pashley and Saunders) (D. U.). Inland, Greater Spotted Woodpeckers were seen at

Caister and Whitlingham about this time, a Bittern at Hickling, and a Black-throated Diver at Rollesby (Cole).

26th.—I learn from Mr. B. Dye that quantities of small birds have been brought into Yarmouth market, mostly Sky-Larks, Starlings, and Thrushes. Nine Lapland Buntings also were taken during November by one birdcatcher, but Siskins have been scarce (Dye).

28th.—A Little Auk, captured at Cantley, had inside it fourteen little fish resembling the fry of Roach (Roberts), which it may have caught in one of the dykes leading to the River Yare. These little fish were from one to three inches in length, and one or two of them, judging from their perfect condition, had been only just swallowed. About the same time (D. U.) a Little Auk was caught on some ice at Acle.

DECEMBER.

6th.—A Black Redstart (female) caught in a Yarmouth fish-house, where it must have found something edible to attract it, which Mr. Lowne has, or had until recently, alive, making the fifth of this species during the year.

14th.—A fine cock Bearded Titmouse, killed by a boy on the river at Norwich, near the Dolphin baths (Gunn), where there are some reeds, which I never heard of as attracting one of this species before. About the same time (D. U.) some were seen at Horning, and three or four on the coast (Gunn), but there is no reason for thinking that these latter had crossed the sea.

17th.—Two Lapland Buntings seen by Mr. C. Gurney at Cley, where others had been seen a short time previously, and one shot (D. U.).

29th.—Stone-Curlew near Bury (Tuck).

VARIETIES OF PLUMAGE.

January.—A cock Redstart† with some white on its wings brought to Mr. Lowne, who kept it alive.

February.—On the 1st Mr. Patterson forwarded a pale variety of the Mallard,† which he had detected with a Duck in Yarmouth market. During the month (D. U.) a cream-coloured Stock-Dove was obtained at Hockham by Mr. Partridge.

March.—A white Rook at Horning (Bird).

April.—On the 28th a singular Redstart,† with a pale back and sandy-coloured wings, appeared near my house, and within a mile of where I met a similar variety—possibly the same bird—in 1902.

June.—A white Starling at Bacton (Bird).

July.—A cream-coloured Starling at Kilverstone (W. G. Clarke); chestnut Blackbird at Thetford (Clarke).

August.—During this month (D. U.) an isabelline or cream-coloured Cormorant was seen by Mr. Cresswell perched on a beacon at the mouth of the Wash, with three or four others of the ordinary type. A white Redpoll with a yellowish cap in a cage at Yarmouth (Patterson), but when or where captured is not known; possibly the same bird that was exhibited at Norwich Bird Show in 1893.

September.—A beautifully pied Chaffinch, taken alive at Horstead (Sir E. Birkbeck), and a white Swallow seen at Burgh. On the 21st a variety of the Partridge† was sent to the Museum from Cantley, remarkable for the mealy tint of its back and chest, and its almost black lores and very dark ear-coverts. It was only a young female; if it had been adult these colours would have been more pronounced, but it would not have become as melanic as the variety shot in November, 1893. On the 2nd, I am informed by Mr. Arnold, a very dark Stonechat, amounting to partial melanism, but showing white on the wing and neck, was shot, and it was subsequently submitted to Mr. Howard Saunders.

October.—A fawn Linnet at Cley (C. Gurney); a slate-coloured Robin near Bury; a spotted Starling exhibited in Norwich.

November.—On the 5th a very good *Perdix montana*,† the Spangled Partridge, was shot near Dereham (Gunn). This variety must not be confused with the French *Perdrix roquette*. A Woodcock with four white primaries in one wing,† and one and some coverts in the other, shot at Foulsham (Southwell).

December.—About the 24th a Woodcock with the anterior half of one wing† white was shot at Horsford, perhaps from the same nest as the other. Mr. Cole had a cream-coloured Redwing from Forncett on the 31st, and Mr. Lowne a pied Sky-Lark about the

same date; also a white-tailed Starling was seen several times on Cromer hills (Birch).

POCHARD DUCK.

A drake Pochard, which had lived with other pinioned water-fowl for six or seven years, died on May 23rd. It had become so tame that it would readily take bread—which it seemed to prefer to barley—from the hand, literally fighting for it when it was hungry, if withheld. Its power of sight was extraordinarily quick at long distance, but much less so in the case of near objects. On the ice it was the most helpless of birds, owing to the backward position of its legs, sprawling about at every step it took; while Mallard, Teal, Wigeon, Pintail, and Shoveler could walk with ease. Every summer it underwent a considerable change of plumage; the black breast became a rusty colour, the head grew browner, and the grey vermiculations on the back duller. But it cannot be said that this species ever assumes the plumage of the female, or goes into an eclipse as the Teal and Mallard and many others do.

The "Pagets' Pochard," a hybrid between the Nyroca Duck and Common Pochard, taken in 1898, and occasionally mentioned in these pages, is still alive. It is rather shy, and seldom dives. The plumage is at its brightest at the end of January, when the bay colour of the breast is very rich in tone; in the more dingy plumage of summer its hybrid origin might be easily overlooked.

WINTER NOTES FROM LLEYN.

BY O. V. APLIN, F.L.S.

(Concluded from p. 50.)

GOLDEN PLOVER.—Numerous in the fields near the coast about Afon Wen; one flock of a hundred or more on the wing. It is said to be abundant at Aberdaron in severe winters, and at such times hundreds visit Bardsey. None had been seen this mild season.

PEEWIT.—Fairly numerous I saw several good flocks. None seemed paired by the time I left.

RINGED PLOVER.—Some in the harbour, and a good many along the shore in flocks with Dunlins.

TURNSTONE.—Met with once in the harbour, and on several occasions along the shore, singly or several together, flying with Dunlins and Ringed Plover. The note is a loud shrill “ticket ticket ticket,” or “ticky ticky tickey.” Some seemed to be adult.

OYSTERCATCHER.—Seen about the harbour, and in little flocks along the shore. About Abersoch I saw some about the cliffs, where they looked very pretty on the dark rocks.

REDSHANK.—Always to be seen in the harbour at Pwllheli; common, noisy, and rather tame.

KNOT.—Two, with some Oystercatchers, on the sands on Feb. 1st.

PURPLE SANDPIPER.—The keeper of the lighthouse on St. Tudwal's Island said there were a great many on the larger island this winter, so tame that they could almost be caught in one's hand.

DUNLIN.—Some about the harbour, and on the 5th and 6th some good flocks on the shore a few miles north of Pwllheli, where good feeding-ground is exposed at low tide. I think that at high water they go over the sand-hills to sit in the fresh marshes.

SANDERLING.—I saw three or four about the stones and sands east of Afon Wen.

BAR-TAILED GODWIT.—The great terraced shingle-bank which begins a little to the east of Pwllheli is stopped abruptly by the low rocky headland of Pen-y-chain. East of this again the coast-line is formed of green-topped low earthy cliffs, full of stones and some bands of rock, all wasting. Near the Afon Dwyfawr this merges into sand with marram-grass, and a point of this runs out between the river-mouth and the sea ; the river itself runs out rapidly through firm banks. The sea along this stretch of coast goes out rather a long way, and exposes a pebble strand, strewn in places with big boulders, and interspersed with bands of sands ; the stones are often thickly covered with bladder-wrack well below high tide, and there is a suspicion of *Zostera marina* in places. West of the mouth of the Afon Wen, and again about the mouth of the Afon Dwyfawr, there is an extensive waste of pebbles and boulders. All this makes a very favourable haunt for certain kinds of waders and some other birds. Here, on Feb. 2nd (a bright sunny day), as I crept up to the edge of the low cliff and looked over, I saw a very pretty sight. Among the boulders a lot of birds were sitting about. A dozen or so of Wigeon, some Curlews, and Oystercatchers I made out before they took the alarm, but my attention was riveted on quite a score of Godwits ; some were quite grey-looking on the back, others browner.

CURLEW.—Numerous ; good big herds, up to fifty or sixty birds, seen on grass and ploughed fields, and grassy headlands ; and a still bigger one once on the sands, and some about the pebble shore, &c. By the 11th they were getting the sweet tremulous trill of whistles to some extent ; other cries were “ kly-yike ” and “ coor-lee.”

WOODCOCK.—None seen this month about the mountains at Aberdaron, where in frosty weather at this time of the year one gun has killed five in a day.

SNIPE.—I had no opportunity of beating marshes, where I am told the Snipe-shooting is good sometimes. But I flushed a Snipe on the 11th from dwarf gorse and stunted heather on the top of Llanbedrog headland, the landward end ; a very dry spot.

HERON.—Occasionally seen.

MOORHEN.—Very common. I saw perhaps a dozen in a day.

COOT.—Numerous on the Afon Wen meres, where I counted forty-one; twenty or thirty on Llyn Glâs fryn, and some seen on the Afon Rhyd Hir, and the lower reaches of the Afon Erch.

WILD DUCK.—Seen in some numbers on various waters. One on a little open pond near Mynydd Annelog, said to be a great place for them in frosty weather. Wild Ducks, with Wigeon and Teal, are fond of passing the day on the larger St. Tudwal's Island, where they are seldom disturbed.

WIGEON.—On Feb. 11th a lot of Ducks—from one hundred to one hundred and fifty—were scattered over the shallows in Llanbedrog Bay, under the headland. It was dead low water, and the sea had gone a long way out, exposing pebbles and sandbanks and low rocks. A great number of birds were collected here, including Gulls and various Waders. All the Ducks that I could make sure of with the glass were Wigeon, and the well-known "whew-oo" often came up to me quite loud on the still air. Some were evidently paired. I have already mentioned some near Afon Wen, which I put up again from among boulders further along the coast. I could make out some of these pretty Ducks, so active on their feet, on the lower part of the Afon Erch.

TEAL.—Seen on the Erch—a good bunch on one occasion. Known as a winter visitor to Aberdaron.

POCHARD.—One good drake and one duck on Afon Wen mere.

TUFTED DUCK.—One adult drake and a duck there; also two or three dull-coloured birds, probably of this species, but I could not get near enough to be sure of them.

GOLDEN-EYE.—One, a female from its size, there; and one in immature dress, diving with great energy on Llyn Glâs fryn.

SCOTER.—A Scoter of some kind off Pwllheli on the 3rd, and eight under Llanbedrog headland on the 11th. Described to me as a winter visitor to the coast at Aberdaron.

GREAT NORTHERN DIVER.—Mr. Caton Haigh writes word that he saw one well up in Pwllheli Harbour about the middle of March, 1903, and another under Llanbedrog Head.

RED-THROATED DIVER.—I saw an adult in winter dress feeding

at the mouth of the harbour on several days; the dives lasted about thirty seconds, but more if the bird was alarmed and moving off.

LITTLE GREBE.—Seen on the Afon Erch, and two on Afon Wen mere.

RAZORBILL.—On the morning of the 5th, after a heavy raking sea all night, the shore was strewn with seaweed, a vast lot being thrown up, including a lot of thin grassy stuff. The people were out getting driftwood, and I found a two-year-old Razorbill, quite fresh, but little more than skin and bones; the inside of the mouth was buff or yellow-buff. The dried remains of another were flung on to the road by the gale.

GUILLEMOT.—Four in winter dress off the harbour mouth on the 1st; cold N.N.W. wind, some snow, and stormy. I have never in this district heard the Guillemot called “Eligoog” (Heligôg), a name possibly confined to South Wales. “Salt-water Cuckoo” seems a most appropriate name; descriptive of the habits of a bird which, by the regularity of its appearance in vast numbers at sea-washed rocks in the spring, so forces itself upon the notice of those who dwell in the neighbourhood of great breeding-haunts of sea-fowl. These Auks appeal to the eye as harbingers of spring, just as the Cuckoo appeals to the ear in the same manner. For the name has probably never been the exclusive property of the Guillemot, but was shared by the Puffin and the Razorbill. Ray, treating of the birds of Caldey Island in 1662, says, in one of his Itineraries, that Razorbills are called “Elegugs,” and writes:—“This name Elegug some attribute to the Puffin, and some to the Guillem; indeed, they know not themselves what they mean by this name.” They doubtless meant all three species, all being eminently migratory, although we know so little about the extent of their migration, whether it extends far or not. Perhaps they are so spread and scattered over the seas in winter that there are never many together. On the other hand, numbers together are sometimes thrown on the shores dead after stormy weather. Yet the fact remains that those who go down to the sea in ships do not seem to meet with Auks in the vast numbers we should expect them to be after a successful breeding season. By the end of winter their ranks are evidently thinned; otherwise the breeding stations would become hopelessly congested.

CORMORANT.—Much less commonly seen than in summer. One on Afon Wen mere; a few seen along the coast (five flying together once), and two or three flying over the sea below the Bird Rock.

SHAG.—Seldom seen; only on three occasions. Two or three flying over the sea below the Bird Rock. One in the harbour threw a flat fish, nearly as big as an afternoon tea-plate, into the air; too big, indeed, for this voracious bird, which rose and flew away, in disgust, I suppose.

BLACK-HEADED GULL.—Very numerous in the harbour, some of the grass-marshes, and the arable land where ploughing was going on; indeed, they were seen commonly on most of the low ground except the seashore proper, where they were met with much less frequently. The “pwl,” or harbour, was generally full of them, their harsh Crow-like “kare,” “kah” or “kahr” being constantly heard, and contrasting with the squeaky “skeeee” of the Common Gull. There was usually a flock about the grass-fields, and the edges of the fresh-water pools inside the dam at Pwllheli, and I could generally see from my bedroom window a little flock about the cabbage-gardens. Gulls fly all over the far end of Lleyn—and, indeed, most other parts of it—quite freely. The Herring-Gull and this species are the commonest inland. By far the larger number of the birds in the “pwl” were adult, but there were a few quite young birds about. Some had perceptibly dark hoods by Jan. 31st, and I saw one with it nearly complete on that date, and others a few days later.

COMMON GULL.—Fairly common about the harbour, and a few offshore and inland; and most of the birds in a great gathering of Gulls on the sands east of Abersoch on the 3rd appeared to be of this species.

HERRING-GULL.—The adults of this species appear to frequent their summer quarters at this season more than other Gulls. On the 3rd I noticed them sitting about the cliffs, but of course in smaller numbers than in summer, and there were none actually on the Bird Rock. They feed inland a great deal. The young birds were seen at Pwllheli and along the flat shore much more commonly than the adults. But I was surprised at the small proportion of immature Gulls of any species which I saw, and it was evident that the bulk of the young birds had gone else-

where. This is very probable, as nothing is more common in summer than to see large numbers of immature Herring-Gulls frequenting localities where this species does not breed. The dark rocks of the Lleyn coast set off the peculiarly delicate colours of this bird to perfection.

LESSER BLACK-BACKED GULL.—I saw one at the Bird Rock, and I believe one other (but too far off to be sure of, though it looked too small for its relative) near Abersoch. When we consider that this bird breeds not far away, it is surprising how rare it is in Lleyn. Ray and Willughby, however, saw it at Pwllheli on May 30th, 1662. The former writes:—"We saw another *Larus*, more black on the back, and that had yellow legs" ('Itineraries'). An early mention of this bird as British.

GREAT BLACK-BACKED GULL.—There were adult birds (two on one occasion) in the harbour on three days, and I saw another at Llanbedrog.

KITTIWAKE.—Not at all numerous, but a few to be seen off the shore, and there were a few flying over the sea about the Bird Rock. This is a true marine Gull—a bird of the sea and the rocks—and not seen in the muddy harbour or on the fields. Almost every one I saw closely was adult. One morning when it was blowing very hard, and there was a fine sea on, two Kittiwakes (young and old) were flying up and down off and outside the great rock called Careg yr Imbril (probably once an island), which stands at the mouth of and shelters the harbour. They were fully exposed to the strong wind which flung the spray on high, while just inside, had they chosen, they could have found shelter.

NOTES AND QUERIES.

AVES.

Nesting Habits of the Wren.—It is a well-known fact that the Common Wren (*Troglodytes parvulus*) builds one or more unlined nests near the one intended for breeding purposes. On June 19th, 1904, I found a nest containing five nearly fledged young birds, near which was one of these unlined or "cock" nests, as they are often called. On the afternoon of June 19th the young had left the nest in which they had been hatched, and on the evening of June 20th I was surprised to find that they had taken up their quarters inside the "cock" nest. They remained in their new abode, where they were fed by their parents, until June 23rd, but after that date only returned to it at night, and forsook it altogether after July 6th. I have never before known a "cock" nest to be used for such a purpose, though the male birds are supposed to use them as roosting-places.—CHAS. H. BENTHAM (Keymer, East Hill Road, Oxted, Surrey).

Hairy Variety of the Moorhen.—About the middle of January a specimen of this curious variety was caught by a Dog quite near Bury St. Edmunds, and taken to Mr. Travis, the birdstuffer, in that town. It is evidently a young bird of last year, warm sandy brown above, greyish white below, with the head and throat almost of the normal colour. The texture of the breast-feathers rather reminded me of the coat of a wire-haired terrier, but Mr. Travis remarked that to him it was suggestive of the plumage of an Emu. The only record of this variety in the current series of this Journal seems to be that by Mr. Forrest (Zool. 1901, p. 108), who has had the unusual opportunity of examining five specimens, and also mentions the Emu by way of comparison.—JULIAN G. TUCK (Tostock Rectory, Bury St. Edmunds).

Ruddy Sheld-drake (*Tadorna casarca*) in Lancashire.—On October 9th, 1892, after a westerly gale and an abnormally high tide which flooded the marshes of the Mersey Estuary, and drowned many cattle and Sheep, a Ruddy Sheld-drake was shot by Mr. James Mercer on some flooded meadows at Ditton, near Widnes. Mr. Mercer, who has

kindly allowed me to examine the bird, says that it was very wild, and that he had some trouble to get within shot of it. As the Ruddy Sheldrake is frequently kept on ornamental waters, suspicion not unnaturally attaches to most of the birds shot in this country. In view, however, of the wariness of the Ditton example, and the fact that it was obtained in 1892—a year memorable for the incursion of this species into Britain and Western Europe—there can be little doubt that it was really a wild bird; and the occurrence is perhaps of sufficient interest to warrant this belated notice.—CHARLES OLDHAM (Knutsford).

Peculiar Nests and Nesting-Sites of the Lapwing (*Vanellus vulgaris*).—*Nest 1.*—One day, when photographing Redshanks' eggs, I came across a very unusual Lapwing's nest, containing three eggs, placed on a slight eminence two or three inches high, situated in very marshy ground, the water reaching up to our ankles for several yards around. The nest was well built of dry grass, with quite a high foundation on the little mound; from its sides extended at intervals several stalks of grass, plaited together, reaching to the ground, and evidently acting as supports to the edge, so as to keep the eggs dry. My friend Mr. John Stares (who was with me) remarked that when in Spain he was struck by the fact that in dry places the Black-winged Stilt made a rude apology for a nest, but in damp situations built a much more solid and elaborate structure. The dried grass composing the Lapwing's nest contrasted strongly in colour with the bright green grass growing around. Some years ago I read that, in the 'Transactions of the North Staffordshire Field Club,' two somewhat similar nests were reported, ten inches high, composed of dry stems of water-plants, none thicker than a goose-quill; but it was not mentioned if they were placed on wet ground.

Nest 2.—A Lapwing's nest in a field of peas, completely concealed by the crop. The eggs (four in number) had been laid, not when the field was bare, but after the peas had grown some height, and formed quite an arch over the nest; this I have never seen before. The hen began to sit, and on the first and subsequent occasions, when I approached, flew direct from the eggs, without any preliminary running, the thick growth around evidently preventing her seeing me till quite close.

Nest 3.—On a few occasions I have found a Lapwing's nest which contained a stone in the centre, the eggs lying around it, not in their normal position, *viz.* pointed ends turned downwards and inwards, but sideways, the pointed end of one to the broad end of the next. Of

course, a stone is sometimes seen occupying a place among the eggs—in the sand-scooped nest of the Ringed Plover—but I have never read of this in reference to the Lapwings, although it is well known to some farmers. On these occasions the nest is always placed on a stony field. Tricks by mischievous boys placing stones among the eggs cannot be urged when nests are on well-protected lands and carefully watched. I think nests 1 and 2 may have some interest for those studying development in nest-building.—J. E. H. KELSO (Southsea, Hants).

Great Crested Grebes in Richmond Park.—I reported the arrival of the pair of Great Crested Grebes (*Podiceps cristatus*) on the Penn Ponds last year, and am pleased to state that a pair have arrived again this year; and I thought that the following notes made to-day (Feb. 25th) might prove of interest to readers of 'The Zoologist.' At first, through my field-glasses, I could only see one bird, which was in full breeding plumage. This bird (which is probably the male) was treading water, splashing with his wings, and spinning round on his stern like a teetotum. Presently, with neck stretched to its full extent straight in front of him, he lies flat on the water, flaps his wings, and utters a hoarse croak. I see now the cause of his excitement, for coming towards him is the other Grebe, also stretched along the water in the strange position as the first. The two meet breast to breast, and chatter together, and spar with their bills. The second bird is not in breeding plumage, but retains the winter dress, and is probably an immature female. The two then swim in company, and visit the nesting-place of last year. This is, however, now covered with water, save a few stumps of wood and reeds. The male bird dives, bringing up a bunch of weed, which he gives to the other bird. The two play with the weed for a little while, then leave it. What makes the Grebe bring up this weed, for these birds do not feed on it, and it is the stuff their nests are made of? Can the bird have mistaken the time of year, and thinks the nest ought to be commenced? We feel sure the immature bird is not the female of last year, and, if this be so, can this action on the part of the male bird of lifting the weed be to show this young bird how and where to build the nest? The cries of these birds were very loud and quite audible some distance off. Besides making a croak every now and again, they would utter a curious buzzing sound. These birds have arrived very early this year, for I did not notice them on the ponds last year until April 17th, and I saw them reported in a daily paper shortly after that date.—GORDON DALGLIESH (29, Larkfield Road, Richmond, Surrey).

Notes from Barnstaple.—

AVES.

GREENLAND JYR-FALCON (*Hierofalco candicans*).—On March 13th, 1903, an adult male was shot on Lundy Island by Mr. Penington. He then sold it to Mr. Hoyle, of Instow, who stuffed the bird. Nearly twelve months afterwards it was bought for £10 by the curator of the Exeter Museum, where it is at present.

PEREGRINE FALCON (*Falco peregrinus*).—This bird used to breed on the cliffs with the Guillemots, but of late years it has been ruthlessly shot down at every opportunity; consequently the bird seems to have left us, and moved into Somerset. The last I saw was during April, 1903, at Santon.

DIPPER (*Cinclus aquaticus*).—Quite a common species, especially on the River Yeo, where last year I found several nests. One was placed in a peculiar position. It was inside a hollow tree which was three or four feet away from the river. The birds went in and out by means of a hole on the river-side of the tree. But the nest was not built just within the hole, but a considerable way up the trunk. Thus, when the parent birds wished to leave their offsprings, they had first to quit the nest, then to drop down the trunk, and finally out the hole! I have found nests, however, in most unfavourable places, where they must have been noticed by every rustic that came near.

CHIFFCHAFF (*Phylloscopus rufus*).—One of the commonest of our migrant natives. Last year their numbers seemed to have increased. A habit which the Chiffchaff appears to be rapidly developing is that of catching flies on the wing. I have watched them for hours feeding in this way, but when thus engaged their flight is always short, barely a yard from its perch, then back again, like the Kingfisher when fishing.

GOLDCREST (*Regulus cristatus*).—A common bird, usually to be found in the dense fir-plantations, where, if it were not for its shrill "tsik tsik," it might easily be passed over. On May 13th, 1903, I discovered a nest, with eggs, lodged in the middle of a thick ivy-bush which was clinging to a young oak not ten feet high; but it was safely interwoven among the ivy-stems.

LESSER WHITETHROAT (*Sylvia curruca*).—Not so often met with as is the Common Whitethroat; indeed, I think it is even considered rare in North Devon. Yet last year I frequently met with it, and was fortunate enough to find two nests—one on May 17th, and the other a few days later, both with fresh eggs in them.

STARLING (*Sturnus vulgaris*).—Always plentiful, especially during winter, when large congregations move about. It has been said that

these immense flocks drive away the song-birds, but, as far as I can tell, this is not the case here, for Thrushes and Blackbirds seem to be almost on the increase. On several occasions last year I saw an albino and also a black and white one. With regard to albinos, on Jan. 25th, 1904, I observed a white Pheasant at Tawstock, and this year one was killed at Tapely Park, Instow. During the early part of this January a white Thrush was shot at Chittlehampton, and a black and white Crow seen at Barnstaple. Starlings must have several broods every year; there were still unfledged young in a nest as late as Oct. 22nd last year. They are very fond of a bath, and I once saw seventy-five all bathing together in the Taw.

RAVEN (*Corvus corax*).—This species still breeds with us on the coasts, the most favoured localities being Baggy Point, Ilfracombe, and Combemartin. At Baggy Point the nest has grown to a large size, and will increase in size, I imagine, until the birds are shot or driven away. They breed during the end of February.

KINGFISHER (*Alcedo ispida*).—A very common bird on the Taw during the autumn, but they breed here sparingly. A considerable influx of visitors takes place during October, when they can often be seen darting under the Long Bridge, or sitting on a boat moored up near the South Walk.

WATER-RAIL (*Rallus aquaticus*).—Not an uncommon bird, but leaving us to breed. Notwithstanding their shyness, I know of one pair which regularly return to a reedy ditch by the side of a railway, and I have seen them cross the rails just after a locomotive has whirled past! I notice they prefer feeding among the reeds on the borders of the pond, rather than on the pond itself. Here of an evening they may be seen darting their slender bills into the mud continually, evidently enjoying a good meal.

RINGED PLOVER (*Ægialitis hiaticola*).—The commonest of the shore birds. It breeds near the Braunton Lighthouse, on the beaches cast up against the sand-dunes. Sometimes I have found the nests surrounded by a ring of broken cockle and other shells. These nests are very pretty indeed, although I have not succeeded in discovering the reason why they are so decorated. The fishermen tell me that they sometimes find addled eggs floating on the water.

GREY PHALAROPE (*Phalaropus fulicarius*).—On Jan. 15th and 16th this year, during a strong easterly gale, I saw several of this species on the mud-flats near Barnstaple. The Ringed Plovers were politely showing them round! Thus I found them very difficult to approach, but on one occasion I got within thirty-five feet of them. They kept very close to the water's edge; therefore it was not easy to spot them,

as the colour of their backs harmonised with the colour of the water, which is saying a great deal for the colour of the water.

SANDERLING (*Calidris arenaria*).—A small flock is sometimes seen on the mud-flats during the autumn. A specimen has been reported to have been found dead in October last by a waterman while attending his lines. It had been killed in a curious way. The bird pecked at a Cockle which was sunning itself, whereupon the Cockle shut up its shell on the bird's bill. The Sanderling, unable to rid itself of its captor, died, and the Cockle too! The bird has been sent to a museum.

CURLEW (*Numenius arquata*).—A very common bird, breeding on the moors. During the autumn it is very tame. I suppose these tame birds must be the inexperienced young ones which are on their first migratory journey. They usually feed at the edge of the water, but sometimes they take to wading deep or even swimming. When they do this they procure a large amount of food, thus arousing the jealous nature of the Gull. The Gulls nudge them, as it were, and hover over them until they drop the tempting morsels, which their foes greedily devour. I have often seen Gulls flying after Ringed Plover in a most absurd way, but not for any food that they might drop, only to punish them for some impertinent offence!

HERON (*Ardea cinerea*).—To be seen singly on the river throughout the year, but just about the beginning of January quite a little flock collect and feed on the mud-flats near Fremington. Then during March they breed in a large fir-plantation, not a great distance from the Fremington Railway Station.

SHELD-DUCK (*Tadorna cornuta*).—Common near the estuary of the Taw. It breeds on the Braunton Burrows. The nest is very hard to find, as the bird darts into the hole like an arrow at a terrific speed. Last spring a friend of mine picked up two addled eggs out in the open down on these burrows. They were at about one hundred yards' distance from each other. In the spring the burrows are dotted with small lakes, which as the year advances dry up, leaving damp hollows. It was in one of these hollows that the eggs were found. Possibly they were laid in the water.

SHOVELER (*Spatula clypeata*).—A pair remained to breed last year at Braunton, on one of the Duck-ponds near the lighthouse. By April 26th the eggs were hard-sat, and the chicks came out a few days later, I believe.

PISCES.

TORPEDO ELECTRIC RAY (*Torpedo hebetans*).—An extraordinary catch was made by a Barnstaple fisherman during the early part of May last year. It proved to be a Torpedo Electric Ray, or Numb-fish. It was

fortunate it was dead when found, or the unexpected catch might have had an unpleasant consequence for the finder. It was probably stranded by the morning tide, and died during the day before discovery. It weighed 56 lb., being about 44 in. in length, and 28 in. in width, although measurement was somewhat difficult owing to the shrinkage of the surface of the large round disc, of which the fish principally consists. The fish was paraded round the town.—JOHN CUMMINGS (14, Cross Street, Barnstaple).

The Animal or Animals generally referred to as the "Sea-Serpent."—I forward a cutting from 'The Age' newspaper, relating to the "Sea-Serpent."* As this creature is of world-wide interest, I thought perchance that you would like the subject-matter for 'The Zoologist.' I had intended forwarding you the "note" direct, but, as the captain asked for an early identification, the matter had to be dealt with locally, and necessitated my sitting down and writing the letter offhand; nevertheless it is correct, since I have made this matter a study for some time past.—ARTHUR H. E. MATTINGLEY (Hon. Secretary, Australasian Ornithologists' Union), &c.

"A 'Sea-Serpent' has been reported in 'The Age' of to-day to have been killed, and that enlightenment on the subject was desired. Only quite recently American and French scientists agreed that its existence is no mere myth; therefore it will be interesting to mention what has been recorded about this animal and its existence in Queensland (Australia) waters, since its description to a great extent agrees with the American and French official recognition of the *Megophias megophias*, the classical name bestowed on this presumed species by scientists in the United States Government service. Prof. E. G. Racovitza has collected proofs of the 'Sea-Serpent's' existence, and its abundance in the Bay of Along, Tonkin. The foreign official recognition, however, is somewhat belated, since Saville Kent, who visited Australia some years ago, published a description which was given to him by Miss Lovell, a school-teacher, of Sandy Island, Queensland. He then named the reptile *Chelosauria lovelli*, and to an Australian belongs the credit of discovering the monster. The latest account of the 'Sea-Serpent' was given a few months back by the officers and crew of the French warship 'Décidée,' on the Indo-Chinese station.

* This referred to the creature struck by the 'Armadale Castle' on her voyage to South Africa.

They saw the creature in the Bay of Along, near Haiphong. The commander reported to the admiral 'that as he was standing on the bridge his attention was directed to a round dark mass in the water, about three hundred yards to port. Soon it rose out of the water, and by the undulatory movement he saw an enormous monster, shaped like a flat-bodied serpent, of about 100 ft. in length. It appeared to have a soft black skin, covered with marbled spots, and the head, which rose 16 ft. out of the water, closely resembled that of a Turtle, with huge scales. It blew up two jets of water to a height of about 50 ft. It moved through the water at the speed of eight knots, and when about 150 yards from the gunboat it plunged beneath it, and appeared on the surface about 400 yards away. A broadside of shrapnel was fired at the leviathan, but without apparent effect.'

"Another French naval officer saw a similar animal off the same coast, but it was of a greyish hue. On two occasions Miss Lovell had a lengthy view of this remarkable animal, and was in close proximity to it, enabling her to give an excellent description of its form, colour, and approximate length. Her description states that it had a glossy skin on the head and neck, smooth and shiny as satin. Whilst taking notes of the animal and its appearance, it put its tail out of the water over the beach only five feet away from her, and held it elevated so that Miss Lovell could have walked under it. The only part of the body that had marks like joints (like in shape and size to a common brick) was also on the shore, and resting on the sand; the great dome-shaped carapace or shell, dull slaty grey, was standing five feet high, and so hid its long neck and head from her view, which, before it rose, she could see as a long shadow in the water. The carapace was smooth and without marks of any sort. The fish-like tail was glossy and shiny like the head and neck, but of a beautiful silver-grey shading to white, with either markings or large scales, each bordered with a ridge of white, but, if scales, not like those of a fish in position, as fish-scales lie horizontally, whilst this monster's scales lay perpendicularly. Each scale was the size of a man's thumb-nail. It had a thick fleshy fin near the end of the body, about three feet from the flukes, and, like them, chocolate-brown. The flukes were semi-transparent, and she could see the sun shining through them, showing all the bones to be forked. The fish-like part was about twelve feet long, therefore the total length of the animal was about forty feet. When making out to sea the 'Serpent' threw a quantity of fish into the air by a movement of its tail. It is known by the aboriginals of Sandy Island as the Moha Moha, and, owing to the foregoing description, was placed by Saville Kent amongst the Chelonia, or shield-reptiles, and, owing to

the somewhat Saurian aspect of its mouth-armature and its resemblance to *Chelydra serpentina*, the Terrapin Saurian of North America, which has a rudimentary carapace and horny jaws of a Chelonian, and short clawed limbs and long bulky serrated tail like that of an Alligator, it was named Chelosauria. The only part of the Queensland 'Sea-Serpent' that does not appear to be in order is the fish-like forked tail. Beside Miss Lovell, six other whites attested to the description given, whilst a black observed its legs or paws. It belongs to the Tortoise and Terrapins, and not the Turtle section of the Chelonians, and is not the monster Turtle (*Carettochelys insculpta*) of New Guinea. The description in to-day's issue of 'The Age' is in accord with that given by Miss Lovell, and, as Tortoises sleep upon the water, the steamer must have run one of these creatures down."—Yours, &c., ARTHUR H. E. MATTINGLEY (North Melbourne).—*The Age*, Jan. 27th, 1905.

THE ZOOLOGICAL SOCIETY'S GARDENS.

DURING the month of February some valuable additions were made to the Mammalia in the Zoological Gardens. First and foremost must be placed a female Kiang, brought back by the troops from Tibet, and presented to His Majesty the King, by whom she has been deposited in the Gardens. The Society now has three representatives of the Asiatic Wild Asses—a Persian Onager (*Equus hemionus onager*), an Indian Ghorkhar (*E. hemionus indicus*), and a Tibetan Kiang (*E. hemionus kiang*). The value that should be assigned to the different types of Asiatic Wild Asses is still a disputed point. The characters of the Kiang are fairly well known, but it is safe to state that there is more to be learnt about the races of Asses ranging over Central, Western, and South-western Asia than about any large mammal in existence.

Very few Mammalia either dead or alive come to hand from the area of the Palæarctic Region just mentioned. The Society therefore may be congratulated upon acquiring a specimen of the Persian race of Leopard (*Felis pardus tullianus*), never previously exhibited in the Gardens, and a magnificent male Lynx from the Caucasus. This is a representative of the northern Lynx (*F. lynx*), which ranges all over the north temperate portion of the Europæo-Asiatic continent, and appears as the Canada Lynx in North America.

Albino Foxes are said to be very rare. A specimen, therefore, received by the Society on deposit must be considered a great acquisition.

It is not, however, a full albino, having normally coloured eyes, and tan-tinted ears, feet, and tail. It was one of a litter dug out last spring, the others being normally coloured cubs. The British fauna was also represented by a pair of Badgers from Cornwall.

Pheasants are always a good investment for a menagerie, if proper accommodation can be provided. Their gorgeous coloration and fearlessness make them attractive to ordinary visitors. They are also easy to keep, and hardy, lay freely, and will always fetch their price. It is satisfactory therefore to record that in preparation for the coming breeding season the Society's stock of gallinaceous birds has been reinforced by the acquisition of Manchurian Crossoptilons, Japanese, Siamese, Swinhoe's and Peacock Pheasants, Temminck's and Cabot's Tragopans, and Vulturine Guinea Fowl.

Other birds worthy of mention are a Salvadori's Cassowary (deposited), and a pair of young Common Rheas; also five Cooi Herons and a Roseate Spoonbill from South America; a black Hornbill from the Congo, and two Common Crowned Pigeons. As mentioned in the January issue of 'The Zoologist,' the Society was already in possession of specimens of the Victoria Crowned Pigeons. Hence the two species of these giant Columbæ may now be seen side by side.

R. I. P.

OBITUARY.

PROF. GEORGE BOND HOWES.

PROF. HOWES, whose health had long been precarious, passed away on February 4th, at the somewhat early age of fifty-one. He was of Huguenot extraction, and we read that, while attending a private school, he spent his spare time in making microscopical slides, and a prize of one of J. G. Wood's books incited his interest in natural history. Originally intended for the Church, then for a short time in business, he eventually found his true vocation, and Prof. Huxley, no mean judge of a man, acted as his sponsor. On Huxley's partial retirement in 1885 from his biological professorship at South Kensington, Howes was appointed Assistant Professor, and, in 1895, Professor of Zoology. He was in all respects a follower of his great chief, whose mantle he considered it no indistinction to wear, and was largely interested in the work of our scientific societies—Zoological, Linnean, Malacological, Anatomical, and others. The writer of his obituary notice in 'Nature' states as Howes's belief: "Higher ambition than

that of adding to the sum of knowledge no man can have ; wealth, influence, position, all fade before it ; but we must die for it if our work is to live after us." And thus he clearly recognized the difference between posthumous fame and living notoriety.

FREDERICK OCTAVIUS PICKARD-CAMBRIDGE.

ALL his friends—and he had many—sincerely regret a personal loss in the tragic death of the above naturalist, which occurred last month at Wimbledon, in his forty-fourth year. He belonged to a well-known Dorsetshire family, and was educated at Sherborne, and at Exeter College, Oxford. It was as an arachnologist he was best known to naturalists, a study he had enthusiastically followed under the guidance and inspiration of his uncle, the Rev. Octavius Pickard-Cambridge. But Spiders alone did not restrict the zoological interests of our deceased friend. In these pages (1903, p. 429) he recorded his discovery of the occurrence of the Giant Goby (*Gobius capito*) in the rock-pools of Cornwall ; and he also possessed the soul of the angler. He was enthusiastic in all his pursuits. Some two years ago, when collecting British Dragonflies, we told him of a quiet pond on the Surrey hills where a species could be obtained. On the following day he secured the insect, and his bicycle travelled *viâ* Norwood on his triumphant return to show the spoil. The news of his appointment at the British Museum to succeed Mr. Pocock did not reach him before he died. He was a man of wide social sympathies, and an advanced thinker ; he was also a good naturalist, and a charming companion.

NOTICES OF NEW BOOKS.

The Cambridge Natural History. Vol. VII. Hemichordata, by S. F. HARMER, Sc.D., &c. Ascidians and Amphioxus, by W. A. HERDMAN, D.Sc., &c. Fishes, by T. W. BRIDGE, Sc.D., &c., and G. A. BOULENGER, F.R.S. Macmillan & Co., Limited.

THIS volume is of a more physiological and less descriptive character than some of the preceding publications in this series, and, with the Hemichordata and Ascidians and Amphioxus, this was a necessary expectation that has been well fulfilled. In one hundred and thirty-eight pages Drs. Harmer and Herdman have given a succinct contribution to the knowledge of these more lowly organized creatures, which will be appreciated by any serious student.

With the Fishes, more general interest will be found, or rather a larger number of zoological readers will be reached, though it is possible that the real knowledge of both groups of animal life does not embrace a larger number of authorities in one than the other, though one is of more popular concern. The account of the Fishes has been divided, Dr. Bridge dealing with the subject exclusive of the Systematic Account of Teleostei, which is undertaken by that well-known and competent authority, Mr. Boulenger.

Dr. Bridge has mostly treated his subject in a structural and physiological manner, and his section on "Coloration" is very instructive, particularly when he records the many environmental changes in the hue of fishes. That in some quarters too great a "protective" character has been ascribed to these changes is probable, especially when the change affects both victim and persecutor alike; however, in the last case an aggressive value has been predicated, and to-day biological facts without an illuminating theory seem of nothing worth.

We need scarcely refer to Mr. Boulenger's contribution; he is a well-known master of his subject, and we know when

we read him we can always learn, and from him we may safely quote.

The Sea-Fishing Industry of England and Wales. By F. G. AFLALO, F.R.G.S., &c. Edward Stanford.

THIS is not only a good account of our sea-fishing industries, but it is a volume of more than economic interest, for Mr. Aflalo tells us much about the fishes of the British coasts, and gives that information with no little charm in diction. Compared with our knowledge of the habits of birds, how little we know of the ways of fishes! And yet, as our author tells us, "We have our winter and summer fishes just as we have our winter and summer birds; and the Mackerel and Grey Mullet appear along our south coast with the Swallow and the Martin, just as the Cod and Whiting come later with the Wild Duck and the Woodcock." Then, again, how many unsolved problems appertain to the piscine fauna! "A good year for Pilchards is generally followed by a bad year for Herrings. This alternation of seasons has long been recognized at St. Ives, though no scientific explanation has as yet been given."

We scarcely realize the enormous quantity of fish delivered in London alone. In 1903 the delivery at Billingsgate and Shadwell markets was no less than 216,240 tons, and of this great take 1298 tons were seized and condemned as unfit for food, being at the rate of 1 ton in 166.6, or a little over $\frac{1}{2}$ per cent. The catches of Herrings which have of late years been landed at Yarmouth run into figures that may well "stagger the ordinary imagination." During the season of 1902 between five and six hundred millions of Herrings were brought ashore at that port, while in each of the years 1900 and 1901 the total reached two-thirds of the amount. We could give many more extracts from this book that would be equally astonishing to many naturalists who have confined their studies and observations to the fauna of the land, and sometimes care too little for the creatures of the sea; but we can advise the perusal of Mr. Aflalo's volume by all those who would know some details of a great national industry, and at the same time learn something of the habits of the fishes that make it possible. There are many instructive and interesting illustrations.

Guide to the Gallery of Birds in the Department of Zoology of the British Museum (Natural History). Printed by order of Trustees.

A NATIONAL museum should serve two great objects—the promotion of science in its strictest sense, and the general instruction of the public; by the publications of the last few years the Director and Trustees of the British Museum have shown that they have both these objects very strongly in view. This Guide has been prepared by Mr. W. R. Ogilvie-Grant, contains twenty-four plates, and seven illustrations—some of which have been prepared by Mr. R. B. Lodge—and is issued at the small cost of two shillings and sixpence. We have sometimes wished that visitors, might at intervals, be personally conducted through the galleries by a competent naturalist, so that some lasting information beyond mere interesting recollection would be acquired; if, however, guide-books like this can come into any general use, very much of that object will be attained. There is no doubt that this Guide constitutes a general introduction to a knowledge of birds; Orders and Families are followed in sequence, with reference to the numbered cases in which the illustrating specimens are contained, and a mass of information is scattered throughout its pages relating to food, nesting, habits, distribution, and other matters, which may give a knowledge and love of natural history to those multitudes who can never have the opportunity and seldom the desire to become thorough students of zoology. These publications fulfil a very important function in national education, they become in the very highest degree guides to nature study, they introduce the public to an adequate appreciation of the fauna of this planet, and they likewise—and this is also important—give the British taxpayer an experience that at least some of the national expenditure is devoted to worthy ends, and might on these lines be increased to the advantage of the commonwealth. We believe “Guides” written on the lines of this one are of great public utility, and we trust that means may be found to increase their circulation among the weary sightseers who may be often seen aimlessly perambulating the galleries with a “Tussaud” appreciation of the marvels of animal life. We also hope that other similar guides will soon follow this one. An “Appendix on the Structure of Birds” adds to the value of the publication, and will assist those who are prepared to go farther in the study.

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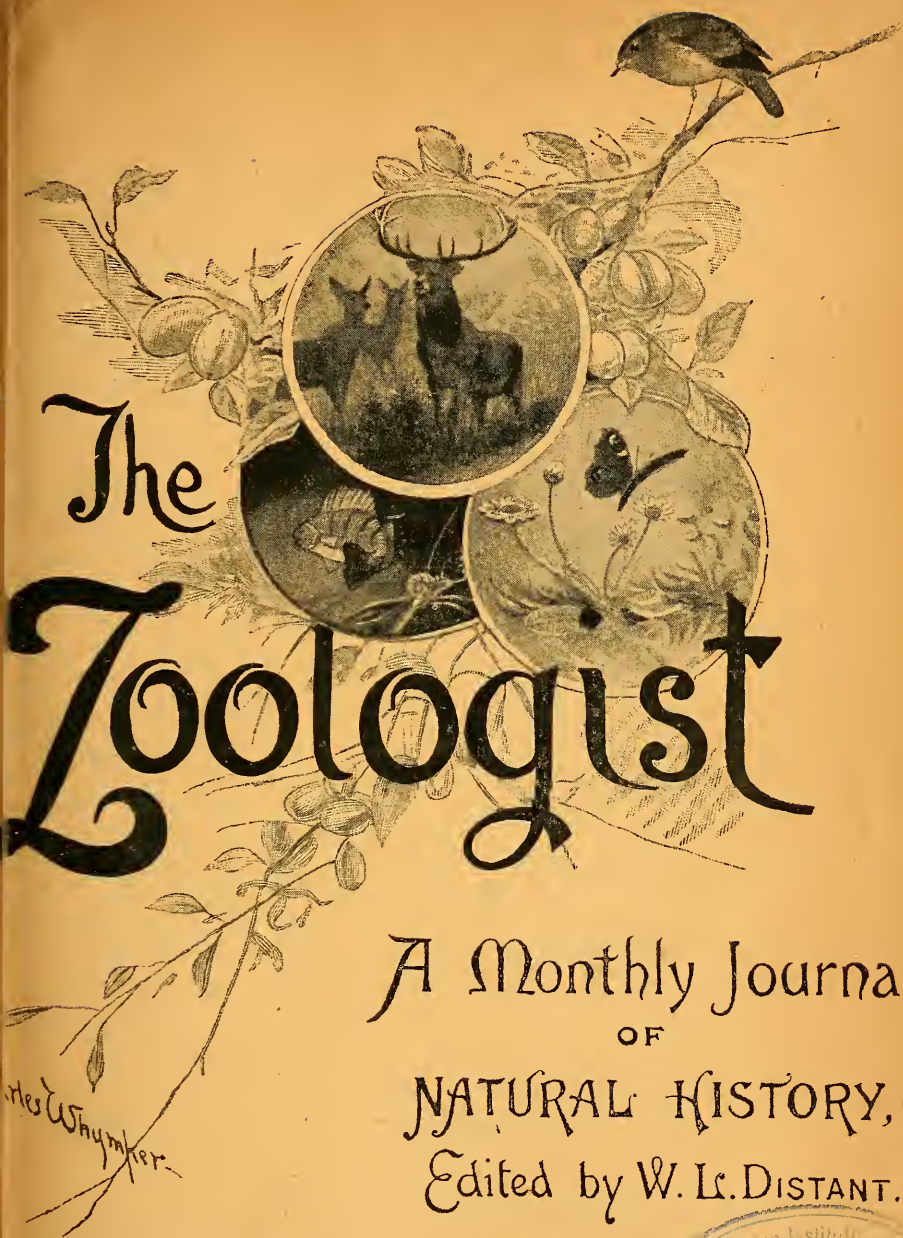
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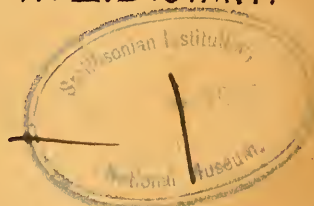
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FIG. 1.

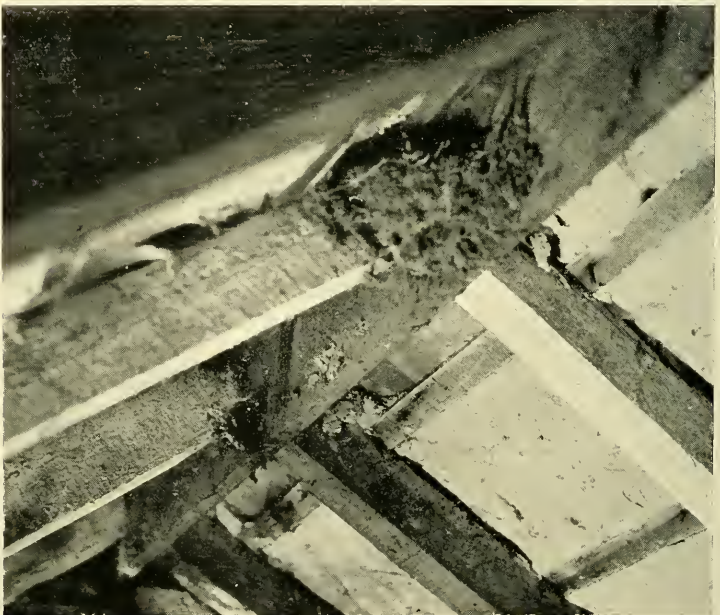


FIG. 2.

NESTS OF SWALLOW (*Hirundo rustica*).

(Photographed by Mrs. New, Backford Vicarage.)

THE ZOOLOGIST

No. 766.—April, 1905.

ABNORMAL NESTS OF THE SWALLOW (*HIRUNDO RUSTICA*).

By S. G. CUMMINGS.

(PLATE II.)

PECULIAR sites for Swallows' nests are occasionally met with, and have received due notice from time to time; but instances of abnormal nests are, I think, of so much rarer occurrence—at any rate, in this country—that they are perhaps worth recording in this Journal. I refer to nests built without support of any kind under them, somewhat after the fashion of the House-Martin, but with even less attachment. Attempts at nest-building of this description by the Swallow are seen now and again, but only to be abandoned as soon as made.

In a loft at Backford Vicarage, Chester, three cases of unsupported nests occurred last summer. One nest, which contained half-grown young when I saw it on June 26th, has since fallen, but two, apparently built after this date, and which I examined recently, are still *in situ*, and within a few feet of one another. One is planted against the comparatively smooth surface of a whitewashed brick wall at one end of the loft, and is entirely without visible support of ledge, projection, peg, or nail; the top edge of the nest is attached to a rafter for about an inch at one side only (Plate II., fig. 1). This nest had

contained young, and has evidently withstood the test well, still firmly adhering to the wall.

The other nest (likewise without support or prop from below) is built against the vertical surface of the ridge-piece and a rafter, in the angle formed by these two timbers at the apex of the roof (Plate II., fig. 2). This one had no signs of having contained young, but there was evidence that eggs had been laid; a part of this structure had given way, but I was able to replace it for the purpose of photography.

The nest with young, found in June, was in a corresponding position to this last.

According to Seebohm (vol. ii. pp. 174, 175), this form of construction is not uncommon on the Continent, but as to this I have no personal knowledge.

It is probable that those birds which have inherited this habit of nest-building would not, as a rule, resort to a ledge or projection even when such were at hand, *e. g.* in this loft the purlins and other horizontal timbers offered suitable and normal sites for the nests, though at a lower level; yet they were not taken advantage of.

There can be little doubt that these nests were the work of one and the same pair, but next summer, if the same birds return, as is most likely, I hope further observations may clear up this and other points.

In the 'Field,' Dec. 10th, 1904, Mr. J. E. Harting, in correcting an anonymous observer's statement with regard to the nesting of the Sand-Martin, writes as follows:— ". . . the Swallow's nest having always some support under it, whether in a barn, shed, summer-house, grotto, or sea-cave. A nest of the Common Swallow built against the face of a chalk cliff (unless on a ledge) would be as remarkable as a cup-shaped nest built by a Sand-Martin against the chalk." It may be presumptuous on my part to differ from so high an authority, but there seems to be no more reason why (apart from the question of site, for a Swallow's nest on a sea-cliff is outside my experience) a Swallow should not build—exceptionally, of course—against a chalk or rock cliff without support under, than against a brick wall or on the perpendicular sides of roof-timbers, such as in the cases above mentioned.

I have once only seen a Swallow's nest in a cave, and that was inland. The House-Martin will occasionally build *in* a cave; in one locality in Anglesea several pairs nested in the roofs of sea-caves a few years ago. The nests were quite invisible unless one was standing almost directly under them at sea-level.

The somewhat indifferent photographs here reproduced were taken in winter under difficulties, but they nevertheless give some idea of the position and formation of the nests. The top of the nest on the wall (fig. 1) just shows at the left-hand corner of fig. 2.

MONTHLY NOTES FOR 1902, TAKEN IN THE
SOUTH OF TASMANIA.

BY JAMES R. McCLYMONT, M.A., M.A.O.U.

JANUARY.

1st.—Near seventh milestone, Hobart to Kingston Road. Goldfinches are now full-fledged. Three young birds taken from a nest and placed in a cage out of doors have been fed by the parents through the netting of the cage. The She-oak (*Casuarina quadrivalvis*) is a favourite tree for Goldfinches; they scrutinize the cones as if searching for food. Perhaps they eat certain slender filaments which grow on them.

FEBRUARY.

1st.—A Fan-tailed Flycatcher (*Rhipidura diemenensis*) is very bold, and enters the verandah in pursuit of insects. Some at least of the jerky movements of this Flycatcher when perched must, I think, be made in order to widen the area of visibility, and also to facilitate a sudden dart upon an insect when it is seen; but the tumbling movements in the air seem to proceed from the necessity of following the elusive movements of the insect prey.

MARCH.

(No date).—A Fan-tailed Cuckoo (*Cacomantis flabelliformis*) was observed near the Alum Cliffs about the beginning of March. It was picking up food from the ground, and had its post of observation in a tree, to which it invariably returned after picking up its food.

APRIL.

1st.—About twenty Swallows are seen flying northwards.

2nd.—A Spotted Owl (*Ninox maculata*) is shot, and kindly presented to me. The interscapular region is sparsely spotted with dull white; the tarsi covered with buff feathers; the toes flesh-coloured, and their surface rough and granular. The beak

is lead-coloured, and darker at the tip than at the base; iris yellow. Length, 12·25 in.

MAY.

16th.—(Four miles from Hobart.) Forest-inhabiting birds are less common here than near the seventh milestone. Fan-tailed Flycatchers, Thickheads, and Ground Thrushes (*Geocichla macrorhyncha*) are not to be seen. Crescent Honey-eaters, on the other hand, and Black-capped Honey-eaters and Spotted Diamond Birds, are more plentiful than I found them to be further from Hobart.

JUNE.

27th.—Two Small-billed Cuckoo-Shrikes (*Graucalus parvirostris*) passed by between the road and the river. I have seen them but rarely in the vicinity of Hobart in the winter months, and those that do appear are silent. One was seen on July 29th, 1900, in a garden in the city. The earliest date on which I have heard their note is Sept. 18th (1892), on the south-eastern peninsula of Tasmania. When this Cuckoo-Shrike settles in a tree or elsewhere it raises, with a jerky motion, one wing or both wings alternately. It is the movement which, when made by a human being, we call "shrugging the shoulders." With this bird it may be an ancestral mode of salutation which has lost its primitive meaning.

JULY.

21st.—A Yellow-throated Honey-eater (*Ptilotis flavigularis*) commences to utter its call, which resembles the clatter of a toy rattle followed by a melodious cadence.

AUGUST.

7th.—A young male Blue Wren (*Malurus gouldi*) is seen in the garden. Blue and blue-black body-feathers are visible amongst the brown.

8th.—Yellow-rumped Tits (*Acanthiza chrysorrhoa*) are separating from the flocks, and beginning to build.

9th.—A male Blue Wren is seen in complete adult plumage.

12th.—*Acacia dealbata* in flower.

15th.—A pair of Yellow-rumped Tits are building in a Pittosporum about three feet from the ground, and are flying to and fro for the greater part of the day with dried-up culms and

sheaths of grasses, and stalks of other plants. Sometimes only two or three minutes elapse between their disappearance in search of material and their return to the nesting-site. About the same time is spent in adding the material to the nest.

17th.—*Eucalyptus globulus* in flower.

18th.—The Tits begin to line their nest with feathers. Swift Lorikeets appear.

25th.—Small brown Lizards (? *Hinulia* sp.) appear. One of these seizes and carries off a grape-skin which is dropped over the verandah-railing.

30th.—Wattle-birds (*Acanthochæra inauris*) are heard. These birds, when seen in outline against the sky, present a singular appearance, owing to the crouching attitude which they assume, their long tails, and relatively small bodies. Pallid Cuckoos appear.

SEPTEMBER.

2nd.—*Acacia melanoxylon* in flower. A male Flame-breasted Robin (*Petroeca phœnicea*) is seen; the first I have observed since last autumn.

8th.—A nest of the Brown Scrub Wren (*Sericornis humilis*) is received. It was found under a gorse-bush. Shreds of moss (a *Campylopus*) cling to the under side of it. It consists of the stems of grasses and other plants, and is thickly lined with feathers, amongst which those of the Grey-tailed Thickhead and the Ground Thrush can be discerned. A few feathers are also interwoven with the outer layers of the building materials, probably in order to obtain additional warmth, for snow is lying on the foothills of Mount Wellington. One egg which I have received is purplish brown; the large end is covered with a round spot of a darker tint. The long diameter measures, in inches, 0·87, and the short diameter 0·65.

14th.—Welcome Swallows are at Kingston (Brown's River).

18th.—Showers of snow fall, and the temperature is unusually low—36° F. at 3 p.m.

19th.—A Magpie (*Gymnorhina hyperleuca*) is collecting wool for a nest-lining.

20th.—An immature male Grey-tailed Thickhead (*Pachycephala glaucura*), in the flesh, is received. There is a wash of yellow on its breast, and a tinge of olive on the marginal wing-

coverts; in most other respects it resembles an adult female. Total length, 7 in.; tail, 3·5 in.; tarsus, 1 in. A female Grey-tailed Thickhead is dark grey, slightly tinged with olive on the upper surface, excepting the tail, which has no olive tinge; the under surface is light grey, passing into dull white on the under tail-coverts. The quill-feathers are brownish above, especially on the outer edges. Length, 7·2 in.

28th.—A White-bearded Honey-eater (*Meliornis novæ-hollandiæ*) occasionally flies into the garden, but is very shy. Like the Magpie, it is collecting wool for a nest, which it is building in a patch of briars by the roadside. Swallows are now plentiful.

OCTOBER.

4th.—The Tits have deserted their nest. A Yellow-rumped Tit's egg from another locality is white, and the long diameter measures, in inches, 0·67, and the short diameter 0·48.

8th.—A Spotted Diamond Bird (*Pardalotus punctatus*) in the flesh is received. A wavy black line crosses the rump, and a few of the upper tail-coverts have red tips; the throat is light orange-yellow.

16th.—A Podargus (*Podargus strigoides*) is received. The young man from whom it was obtained informs me that he took an egg from it. It is a light-coloured specimen, and there is no tawny or chestnut in the plumage. The upper surface is mottled grey, the under surface is a medium shade of ashy grey. (The skin was subsequently presented to the Tasmanian Museum.) A Gannet (*Sula serrator*) appears on the Derwent.

21st.—A Spotted Diamond Bird is observed procuring nest material. Whilst fluttering on the wing it tries to detach shreds of bark from a stake.

26th.—Three young Magpies have been hatched. A Sleeping Lizard (*Cyclodus nigroluteus*) is seen abroad.

NOVEMBER.

22nd.—Two Goldfinches have a nest in a young pine a few feet from the verandah of dwelling-house. When feeding the nestlings they thrust their bills well into the mouth.

24th.—Two young Magpies in the open with the parents pick up their food, and are also fed by the old birds. One bird has disappeared.

25th.—The morning carol of the Magpies is heard about one hour before sunrise. I have noted a few of the hours at which I have heard it. On Sept. 1st the sun rose (approximately) at 6h. 38m., and the carolling was heard at 5h. 30m.; on the 30th the sun rose at 5h. 46m., and the notes were heard at 4h. 55m.; on Oct. 20th the sun rose at 5h. 13m., and the Magpies sang at 3h. 55m.; to-day the sun rose at 4h. 31m., and the birds commenced to carol at 3h. 30m. About this time Swift Lorikeets disappear.

DECEMBER.

1st.—The young Goldfinches have flown from the nest. *Acacia decurrens* in flower.

20th.—*Bursaria spinosa* in flower.

26th.—Yellow-rumped Tits are again to be seen in flocks.

31st.—About twenty Gannets seen at one time. They invariably retire from the river at the same hour—between six and seven p.m.—evidently to seek a secluded roosting-place.

Sandy Bay, Tasmania.

BIRDS OBSERVED AT GRINDELWALD IN JANUARY.

BY THE REV. A. ELLISON, M.A., M.B.O.U.

ORNITHOLOGISTS who are familiar with any part of Switzerland in the summer, and have observed the abundance of bird-life at that season, will probably find it interesting to compare the state of things which exists in the same regions at mid-winter.

I have therefore thought it worth while recording the few observations which I made during a very short visit to Grindelwald in January last. As I was only there for ten days altogether, there were no doubt some species of birds which escaped my notice, but those which were observed were perhaps specially interesting as showing what species are capable of passing the winter in such a region, where the ground for several months in succession is deeply covered with snow. Except perhaps that the snow averages a couple of feet in depth, and that frost is almost continuous, the climate, however, can hardly be described as rigorous; for the weather is generally fine and calm, often with blue skies, and a bright sunshine so warm that on sheltered slopes exposed to the sun's rays it is quite enjoyable, in the middle of the day, to sit in the open air.

But the mere fact that the ground is everywhere deeply snow-covered makes it impossible for any birds to exist which depend upon food obtained from the surface of the earth. The few species to be seen were in most cases such as obtain their food upon the trees, or whose boldness enables them to pick up a subsistence in the immediate neighbourhood of human dwellings. The number of species actually observed did not exceed twenty.

BLACKBIRD (*Turdus merula*).—I several times saw a solitary female close to the houses and hotel gardens in Grindelwald village, evidently the same individual. It surprised me very much to meet with this bird, as the Blackbird is not found at Grindelwald in summer, though it is common at Interlaken. In two different summers I have noted its abundance at Interlaken

and its absence from Grindelwald. In fact, in the Alps, I have always found it to be a bird of the lowest valleys, not seen, as a rule, much above 2000 ft. ; perhaps higher in Southern Switzerland, but not in the Oberland. Probably it leaves even the valleys in the winter, as the ground is generally snow-covered and frost-bound ; and I did not see any Blackbirds at Interlaken when passing through on my way to Grindelwald, though I spent an afternoon there. This solitary individual at Grindelwald may have been an injured bird unable to migrate, and attracted to this village, 3500 ft. above sea-level, by the prospect of obtaining a livelihood in a populous winter resort, where many fragments of food might be obtained near the hotels and houses of the village.

GOLDEN-CRESTED WREN (*Regulus cristatus*).—I watched a bird of this species among the pines on the Faulhorn range, at a spot nearly 4500 ft. above sea-level. The trees were laden with snow, but this tiny bird was busy feeding, apparently finding plenty of food on the under sides of the spruce branches, whose snowy shroud formed a warm shelter. As I have seen this bird here in summer, it is evidently resident, able to hold its own among the thick pines against any rigours of the climate, and to obtain sufficient food throughout the winter from the insects or their larvæ which hybernate among the spruce-fronds, or in crevices of the bark. I may add that in the afternoons I frequently saw small flies about sunny spots on slopes facing the south.

ALPINE ACCENTOR (*Accentor collaris*).—I had abundant proof that this bird is by no means driven from its usual haunts by the rigours of winter, though it may to some extent draw near to human habitations. I saw one on the summit of the Faulhorn, nearly 9000 ft. above sea-level ; another at a chalet on the way up, about 6500 ft., and several near chalets lower down ; but in each case there were only solitary birds, and they were quite silent. Perhaps such an exposed spot as the summit of the Faulhorn would not have been frequented only for the fact that the inn there is open during winter, so that scraps of food might be picked up. The same may be said of some of the chalets mentioned, as tourists make them halting-places, and leave fragments of their meals about. The general colour and form of this bird, together with its speckled throat, reminded me of a

diminutive Thrush. In many of its actions it also resembled the Chats.

DIPPER (*Cinclus aquaticus*).—Quite common on the Lüttschine, the stream which flows in the bottom of the valley, and which seems to be the only stream which never freezes. In winter this torrent is low and clear, very different from the grey and noisy flood in summer, when it is swollen by the melting of the glaciers. The Dipper has no difficulty in getting food even in the sharpest frosts. It was in full song on Jan. 20th, and on many other occasions, too, I heard its cheery twittering notes from the river-bed.

GREAT TITMOUSE (*Parus major*).—Very common. The inhabitants are very kind to the birds, and feed them regularly. A favourite method is to hang out an inverted bottle, corked, and with a piece cut out of the side of the neck. This is filled with hemp-seed or chopped suet, and according as the food next the hole is eaten a fresh supply comes down from above. The chief beneficiaries are the Tits, and of these the Great Tit is far the most numerous. Marsh-Tits are also common, but there is only an occasional Blue Tit. I did not see the Coal-Tit.

MARSH-TITMOUSE (*P. borealis*).—The Marsh-Tit was a common bird, and those which I observed were in every case of this form. They were large dark grey birds, with long tail and large jetty-black cap; indeed, when sharing with the Great Tits in the food put out for the birds, they did not look very much smaller than their congeners.

BLUE TITMOUSE (*P. cæruleus*).—Not numerous compared with the last two species. I several times noticed solitary individuals coming to the food supply.

LONG-TAILED TITMOUSE (*Acredula rosea*).—I frequently heard or saw this bird, generally near the alders fringing the unfrozen river in the bottom of the valley. Those which I saw were the British form, with black band on each side of the head. I have, however, seen the white-headed form at Grindelwald in the summer, and both may possibly be resident.

NUTHATCH (*Sitta cæsia*).—Common and tame. I frequently saw it in the neighbourhood of houses, or clinging under the wooden eaves, where it shares the food supplied for the birds.

ALPINE PIPIT (*Anthus spipoletta*).—I did not see this bird in the Grindelwald Valley, and only mention it because I saw a

small flock near Interlaken. Probably it forsakes the mountains altogether, and is only found in the lowest valleys in winter.

HOUSE-SPARROW (*Passer domesticus*).—Plenty of them in the village. They looked as dirty and untidy as any “city Sparrows” on the pure white snow.

CHAFFINCH (*Fringilla cœlebs*).—Fairly common. Frequent near the houses, where I often saw it partaking, along with the Tits, of the food supplied. It also was often seen on the stones in the bed of the Lüttschine, where it seemed to find food at the edge of the water. Not seen in the woods.

SNOW-FINCH (*Montifringilla nivalis*).—A large flock at the top of the Faulhorn, 8900 ft. They were constantly about the hotel there, and their pleasant twittering quite enlivened that lonely spot. They are evidently able to exist in those arctic haunts the whole year round. I also saw them on the wing lower down, but not in the valley. No doubt they flock and wander more or less in the severe weather. A flight of these birds passing close to the observer, so that the black and white wings are displayed, is a very pretty sight.

BULLFINCH (*Pyrrhula europæa*).—Frequently seen and heard. It seemed chiefly to frequent the margin between the pine woods and the deciduous trees, the former no doubt affording it shelter and the latter food.

YELLOW BUNTING (*Emberiza citrinella*).—Common about the village and the valley, where, together with the House-Sparrow and Chaffinch, it seemed to obtain food from the droppings of horses on the roads, and other refuse in the neighbourhood of houses. As it is common at Grindelwald in summer it is no doubt a resident.

ALPINE CHOUGH (*Pyrrhocorax alpinus*).—A large flock about the summit of the Faulhorn seemed to show that this bird remains in its mountain haunts throughout the year, though how so large and numerous a species obtains food enough in those regions in winter is a mystery. It was certainly interesting to find this bird, the Snow-Finch, and Alpine Accentor frequenting the top of the Faulhorn, 9000 ft. above sea-level, in January, just as in June.

NUTCRACKER (*Nucifraga caryocatactes*).—Heard in the pine woods of the Faulhorn range, though I did not see the birds, which were concealed among the trees. I have seen it at the

same place in the summer, though it is at all seasons shy and retiring.

MAGPIE (*Pica rustica*).—Numerous and conspicuous about the valley, where it was certainly one of the commonest birds. I have seen it at Grindelwald in summer, but it seemed far more abundant in winter. The reason for this may be that it frequents the neighbourhood of inhabited houses more at the latter season, in order to pick up a livelihood. I noticed an old nest in a leafless sycamore near the village.

CARRION-CROW (*Corvus corone*).—Very common, as in summer, but even more noticed, owing to its tameness and frequenting the neighbourhood of houses. I have seen a dozen or more perched on one tree like Rooks. It does not seem to go much above 4500 ft.

GREY WOODPECKER (*Gecinus canus*).—I have no doubt that this and not *G. viridis* is the form found at Grindelwald, and it is common and resident. Its note was frequently heard near the village, but I never noticed it above 4000 ft. In fact, it seemed to confine itself to the region of deciduous trees, and not to frequent the pine forest. I examined a mounted specimen shot in the neighbourhood. It had a conspicuous greenish yellow rump, but its general colour was grey, ash-grey on the sides of the head and neck, a darker grey on the shoulders and back. The throat, breast, and under parts generally were greyish white. Quills brown, barred with white on the outer webs to near the tips, on the inner webs only near the base. A few of the longest upper tail-coverts were grey, between the yellow rump and the tail-feathers, which were brown, with pale bars as in *G. viridis*. The cheeks and lores were black without any red. Instead of the broad cap of crimson scarlet on the head, exhibited in *G. viridis*, with a wedge-shaped extension as far the nape, the scarlet on the crown would be better described as a broad stripe, reaching from the base of the upper mandible, with straight and parallel sides as far as the back of the head, where it ended abruptly with a square outline. The surrounding parts were ash-grey.

In the hotel on the top of the Faulhorn there are mounted specimens of the Blackcock and Ptarmigan, the latter in snow-white winter dress. I was informed that these had been shot in the valley or on the surrounding mountains.

SEALS IN KILLALA BAY AND THE MOY ESTUARY,
CO. MAYO.

BY ROBERT WARREN.

IN the 'Field' of March 4th, Mr. Hubert Donnison gives a very interesting account of the Seals frequenting the sand-banks of the Wash, on the Norfolk coast; while Mr. G. Ellis gives the weight of a female Grey Seal (heavy with young), shot by him in Orkney. It is very remarkable to hear of Seals living in such large numbers on the Wash, quite equalling, if not outnumbering, those in the most favoured localities in Scotland and the Scottish Isles, the headquarters of the Seals in Great Britain. As a few rough notes on the Seals and their habits, frequenting Killala Bay and the estuary of the Moy, may be of some little interest to naturalists and sportsmen, I venture to give them.

We have both the Grey and Common Seals, the former being much the more numerous, the habits of both species being very similar to those as given by Mr. Donnison as haunting the sand-banks of the Wash.

The Moy Estuary is separated from Killala Bay by the island of Bartragh, which is long and narrow, stretching for three miles quite across the inner part of the bay, from the Sligo to the Mayo side; the River Moy running out to the bay by a narrow channel at the eastern end, while at the western end the Moyne channel separates the island from the Mayo side near Killala. The estuary flats inside the island are a wide expanse of hard sand, with a few small islands scattered about it, but quite away from the Seal haunt, which is on the banks of the Moyne channel, to which the Seals resort to rest at low water. Their favourite resting ground is a bend in the channel, where they assemble on a point of sand, from which they can have a good view on both sides both up and down the channel, so that no

enemy can approach unseen. Here they assemble as soon as the tide begins to leave the sand, and remain (if undisturbed) until floated off by the rising flood. Boats scarcely ever use this channel, so the Seals are seldom disturbed; yet, notwithstanding this quiet seclusion, they are excessively wary, and so keen of sight, that not even a shooting-punt is permitted to approach within range, and ordinary fishing-boats not within two hundred and fifty or three hundred yards. They are equally sharp in their sense of scent, so there is no use in attempting to stalk them "down wind," and before I ascertained this fact many a weary crawl I had on hands and knees to where the Seals were resting, and on rising up, gun in hand, to find that all had vanished, and the only trace left of their presence being the deep impressions of their huge bodies in the soft sand.

The numbers seen vary from time to time, but twelve to twenty may be seen any day, while a herd of thirty-four has been counted.

About the end of August and in September we used occasionally to see the females accompanied by their young ones, which, though very small, were able to swim alongside their mothers, and we often thought when seen swimming on the surface that the young occasionally rested on the mother's back between her shoulders, for the position of the cub's head at the back of the mother's gave one that idea. I do not think the females calve on the sand-banks, but suspect they bring forth their young in the many large caves that perforate the great cliffs of the North Mayo coast from Killcummin Head to Benwee Head, where they remain until strong enough to accompany their mothers to the sand-banks of the estuary.

I have only once come across a very weak young Seal. I was walking one evening on the Bartragh side of the Moyne channel, and, observing a Seal resting on the bank opposite, I went towards it for a closer view. However, on my approach the Seal got into the water, leaving a young one behind her, about ten yards from the water; the little calf was scarcely able to crawl, but attempted to follow its mother, feebly crawling a couple of yards, then resting, and bawling like a young calf (the voice

being exactly like that of a cow's calf). It progressed along in this slow way, taking frequent rests, and bawling each time, until it got into the water; and whenever the calf called the mother became excited, furiously dashing about in the water, but never uttering a sound. From the size and weakness of this little Seal, it could have been only a few hours old, but where it was born I cannot think, for there are no caves nearer than Killcummin Head, seven or eight miles off, and the little creature could not have come that distance.

I have shot both species, but never killed a Common Seal of greater length than between five and six feet, but the Grey Seals grow to a far greater size and weight. Some years ago, about the end of May, I shot a female Grey Seal, 5 ft. 11 in. in length from nose to end of hind flippers, girth 3 ft. 8 in., and weighing 217 lb. On skinning and opening her, we took a fully matured young one, 2 ft. 2 in. in length, covered with a thick coat of long white hair. The blubber of the old one, when melted, produced four gallons of pure clear oil.

The old bulls of this species attain far greater size and weight. One shot by a friend a couple of months later weighed 314 lb., and, though so much larger than the female, only produced three gallons of oil. In my experience, the old bull Seals produce far less oil than the females, while the small year-old Seals produce more than either, in proportion to their size. Another old bull, shot by the same friend (a splendid rifle-shot), was obtained after a long stalk over the sands. We observed the herd of about a dozen lying on the sloping edge of the sand-bank quite below the level of the sandy flat; so my friend, making a wide detour inside, crept down on hands and knees opposite to where the Seals were resting, quite oblivious of any danger; he then lay down, working himself, with his elbows, along on his chest, until he got within twenty yards of the Seals; then quietly rising, rifle in hand, and choosing out the largest of the herd, he fired at the middle of his back, sending the bullet right through his lungs. Instantly on the shot the entire herd scrambled into the water, and we thought the wounded beast was lost; but, to our surprise, he rose a few yards from the bank, then dived, but rose again from the same place, as if unable to remain any time under water from the blood filling his lungs.

Seeing him so disabled, we ran for our boat, and soon overtook him, giving him another shot, which turned him over, and, laying hold of his flippers, we held on until he died, and then with great difficulty hauled him into the boat, almost capsizing her in doing so. I did not measure this Seal, but weighed him, when he turned the scale at 350 lb.

The largest Grey Seal ever known to be obtained in this locality was shot at the Enniscrone bag-nets, on June 29th, 1880. He was a very old bull, and measured 8 ft. in length from nose to end of flippers, was 5 ft. 8 in. in girth, and weighed 560 lb. This great beast for over two years annoyed the fishermen very much by tearing the bag-nets, taking the Salmon, as well as scaring others from entering the nets; he was often fired at, but always escaped until this day, when, as he emerged from the net with a live Salmon in his mouth, a man with a rifle was watching him from the pier, and, as he turned his head, fired, and sent a ball through the back of his skull, on which he instantly sank, but next day was thrown up by the tide on the shore with the Salmon still between his jaws. Although this was the largest Seal obtained on this coast, yet much larger specimens have been got on the Farne Islands, off the coast of Northumberland. William Thompson, in his 'Natural History of Ireland,' states "that Mr. George Ransome, of Ipswich, wrote to him that a Grey Seal, weighing 770 lb., had been obtained on the Farne Islands by a Mr. Robert Pattison, of Bedford; and of another specimen captured on the same islands, weighing 740 lb., sent to the British Museum." No doubt equally large specimens frequent the Irish coast, but have escaped capture, or if taken have not been recorded. The late Mr. A. G. More showed me, in the Kildare Street Museum, the skull of a very large Grey Seal, shot by the late Dr. Neligan, of Tralee, on the Kerry coast, but the only statement of its dimensions given was that the skin, when cured, measured nine feet in length.

I have when without my gun occasionally come very close to Seals. On one occasion I was walking down along the Bartragh side of Moyne channel, when, observing a large Seal resting on the bank about ten yards from the water, I thought of trying how close I could get to him; so, dropping on hands and

knees, I began creeping towards him, dropping down flat on my chest whenever he raised his head to look round. In this way I reached within five or six yards, when, turning his head, he saw me, and made for the water. I started up, rushed at him, and just as he got to the water seized one of his flippers, but was unable to hold on, for his vast strength dragged it out of my hands.

On another occasion I was out with my punt and gun very early one morning down at Bartragh, trying for a shot at Wigeon near the Sloke Rocks (a favourite haunt); there were no Wigeon, but at the lower end, resting on a big boulder, was a large Seal. After he had got on the rock the tide had fallen considerably, leaving him stranded at least four feet from the water. Not having my "cripple-stopper" with me, and not being able to elevate the big gun high enough to shoot him, I let the punt drift down to the rock, and, as he was looking out seawards, he did not see me until I gave him a dab in the side with my paddle, when, with a startled snort, he plunged into the water with a great splash, never rising until well out of range.

The last Seal obtained was captured very easily. I was one evening out Rabbit-shooting, and, walking in one of my fields, my attention was attracted by hearing some extraordinary sounds proceeding from the shore—a mixture of grunting and groaning. Looking over the hedge, I saw the sounds were emitted by a young Seal, just come out of the water; but, as the shore was covered with small sharp stones, he evidently disliked his position, and grunted and groaned while wriggling himself into a more comfortable resting place; he then ceased, and, laying down his head, went to sleep. Having only No. 6 shot in my gun, I disliked the idea of firing at and only wounding him; so I thought of taking him alive as he slept. Going back some distance to get down on the shore, I crept up quietly to within seven or eight yards, when a tug-steamer coming up the river, to my great disgust, woke him with the noise of the paddles, at which he raised his head to look out. I took up my gun and fired, hoping that the shot would bother him so that he might be caught before getting into the water; this occurred, and so confused him that he turned to the land instead of to the water; when, rushing forward, and

catching his hind flippers, I dragged him up from the edge of the water; but, though I had him on the land, I did not know how to despatch him. I could not reach my gun to hit him with the butt; there was no bit of wood or stick near me; so, with a puzzled look all round, I at last saw an old cabbage-stump left by the tide a few yards from me, and, dragging the Seal within reach, I killed him by a few blows with it across the snout—the first Seal, I suppose, that was ever killed with a *cabbage-stump*. He was a young Grey Seal of about 70 lb. weight, and was covered with a beautiful coat of silvery white hair.

NOTES AND QUERIES.

AVES.

Early Arrival of the Chiffchaff (*Phylloscopus rufus*) in Cheshire.—On March 19th—some ten days earlier than its song is usually heard in Cheshire—a Chiffchaff was singing at midday in the shrubbery at Oulton Park, where I watched it for some time at close quarters.—CHARLES OLDHAM (Knutsford).

Supernumerary Nests of the Wren (*Troglodytes parvulus*).—It is, I think, probable that the unfinished Wrens' nests so commonly found near those intended for the reception of the eggs are often, if not usually, tenanted by the recently-fledged young, although I have not noticed, in the nests that I have had under observation, the curious haste to quit their original quarters displayed by the fledglings mentioned in Mr. Bentham's note (*ante*, p. 107). For some years I have suspected that the explanation of the supernumerary nests is to be found in the roosting habits of the Wren, but the explanation (if such, indeed, it be) throws little light upon some other points to be mentioned presently. Wrens are known to sleep in companies during the autumn and winter in nests, or in such places as holes in walls, thatches, or haystacks. Now, if we suppose that a pair of Wrens succeed in rearing ten offspring in two broods, the family of twelve will require two, or even three, nests in which to sleep during the winter if other convenient situations are not available. On the other hand, the supernumerary nests are often built before the one in which the eggs are laid, and in some cases such nests appear to be unconnected with a breeding nest. Further, the extra nests are always unlined, and often mere shells of moss. I trust that readers of 'The Zoologist' will be induced to pay attention to the interesting questions raised in Mr. Bentham's note, and I venture to indicate a few points especially worthy of investigation:—(i) If the deserted nest is not again used the feather lining should be taken out and carefully examined for vermin, excreta, &c. If a second brood is reared in the same nest as the first, we have in this circumstance a sufficient reason why the first brood should be provided with extra quarters. (ii) It should be noted whether one of the extra nests is used at night by one or both the birds before the period of incubation. (iii) In the absence of unfinished nests, the vicinity should be examined for other sleeping quarters. I may add that the singular habit of building supernumerary

nests is also shared by the American Wrens of the genus *Troglodytes* (cf. Darwin, 'Origin of Species,' original edit., p. 243; 6th. ed. p. 234). W. RUSKIN BUTTERFIELD (4, Stanhope Place, St. Leonards-on-Sea).

[Samuels accounts for the peculiar habit both the Long-billed and Short-billed American Marsh-Wrens have of building several nests in one season, by the theory that they are made to protect the sitting female, for it is noticed that the male bird always lures a visitor to an empty nest, and, if this does not satisfy his curiosity, to another one, to prove conclusively that he has no family in prospect (cf. Neltje Blanchan, 'Bird Neighbours,' p. 120).—ED.]

Curious Nesting of the Wren.—During the past year the following instances of the nesting of this bird came under my personal observation:—Within our parish church a nest (evidently that of the male) was built in the folds of the curtain at the side of the organ. The nest was by a mishap shaken down, but, nothing daunted, another nest was completed within the same position on the following Sunday; the entrance and exit for the bird being through the open window some short distance away from the nest. In my brother's garden at Oakham, near Dudley, a nest (that of the male bird also) was built within the head of a sprouting broccoli. At Newnham, near Bedford, I had pointed out to me the remains of nests of a Wren that had utilized a succession of strange sites with remarkable perseverance. The first two nests were attempted within the folds of a sack used as a covering placed over the machinery, the third in the pocket of an old coat left hanging near by. The fourth nest, in which four eggs were laid, was built inside the top pulley of a band-saw; fifth nest, in which two eggs were laid, was constructed inside a Sparrow's old nest; all of which positions were within the one engine-shed; the sixth nest, built in a hedgerow close at hand, whence, I am pleased to add, young were successfully reared. In addition, I might note that a nest of the Wren built in a hole in the wall in one of my outbuildings, completed, with exception of a lining of feathers, on March 10th, did not contain a clutch of eggs until May 6th.—J. STEELE-ELLIOTT (Dowles Manor, Bewdley).

Nesting Habits of the Wren.—With reference to Mr. Bentham's note (*ante*, p. 107), the following may be of interest:—Some years ago a Wren's nest was built in some creepers on the wall of the house in which I then lived, and was left in the unlined state. It was in full view of the windows, but was to all appearance deserted. After about six weeks, however, a brood of young Wrens, just flown, appeared in the evening, and took up their abode in the nest for the night; a thing which they continued to do every evening for some time. I regret that the exact length of time during which they continued thus to roost in

the nest was not noted. In November last a friend of mine described to me a nest which had been built the previous spring under the projecting thatch of the roof of his summer-house. As he was uncertain to what bird the nest had belonged, it was suggested that I should come and look at it. It was after ten o'clock at night, and my friend took a lantern to give us light. As soon as the light was cast on the nest under the thatch, which proved to be a Wren's, a Wren darted out of it, fluttered for a moment in the light of the lantern, and disappeared into the darkness, showing that these incomplete nests are intended not only as shelters for the young broods, but also as warm roosting-places during the winter. It would be interesting to hear the opinions of practical observers as to the number of these "cock" nests in proportion to those used for purposes of incubation. I should think them about five to one. That the male is the builder of these nests I have frequently had proof, having heard him sing while engaged in building.—ALLAN ELLISON (Watton-at-Stone, Hertford).

Water-Pipit at Eastbourne.—It is perhaps worth recording that I shot two Water-Pipits (*Anthus spipoletta*) here in November last, on the 17th and 25th respectively. They attracted my attention by their large size and unusually dropping flight; they were flying round some pools of brackish water near the town. I should have reported them before, but waited to get them identified by Mr. Howard Saunders, which has now been done. The local birdstuffer has never had any in before.—E. C. ARNOLD (Blackwater House, Eastbourne College).

Pacific Eider (Somateria v-nigrum) in Orkney.—The bird recorded by Mr. W. J. Clarke in 'The Zoologist' (*ante*, p. 74) differs in several features from the descriptions of the species given by Gray (Proc. Zool. Soc. Lond. pt. xxiii. p. 211, 1855), and Salvadori (Cat. Birds, Brit. Mus. vol. xxvii. p. 431). On Dec. 17th (three days after death) the bare spaces at the base of the bill were dull ochreous yellow, and the tip clear horn-colour. The tarsi and toes were olive-green, the webs blackish, and the irides dark brown. On comparing the bird with the Common Eider, and the type-specimen of Dresser's Eider in the Owens College Museum, Manchester, several differences not given by Salvadori or Gray were noticed. In the Pacific Eider the bare spaces of the bill and the feathered wedge on the culmen are far more acute than in the common species; and, as the latter feature is said to be apparent even in the young in down, it may possibly serve as a means of separating the females of the two species. In the Orkney bird the green colour of the occiput does *not* extend towards the eyes as a border to the black cap, in this point resembling the Common Eider,

and differing from Dresser's Eider and the plate of the Pacific Eider which accompanies Gray's original description of the species. The specimen was exhibited at a meeting of the British Ornithologists' Club on Jan. 18th (*vide* Bulletin of the B. O. C. cxii. p. 32).—FRED STUBBS (Oldham).

Pacific Eider in Orkney (*ante*, p. 74).—In the February number of 'Knowledge' I see the Pacific Eider (*Somateria v-nigrum*) mentioned as having been shot at Scarborough, Yorkshire, on Dec. 16th, 1904, the same mistake occurring in 'Nature.' In the 'Field' of Feb. 18th I gave the full history of the specimen, which was not shot in England at all, but in Orkney. It is as follows:—It was shot by George Sutherland, my assistant boatman, on Dec. 14th, off the island of Graemeay, near Stromness, before my arrival in the islands. He sent it with some other Eiders to a taxidermist in Scarborough, who wrote to young Sutherland, and told him that he could not pay him the usual price for it as it was such a *poor specimen*, and could therefore give him only *half a crown* for it! The buyer sold it to the Oldham Natural History Society as a Common Eider, and the secretary of this Society sent it up to South Kensington, where it was identified as a Pacific Eider. In January and February, 1904, I was also wild-fowling in Orkney, and Sutherland senior, uncle of the above youth, described a bird which he had shot some years ago, which I took to be an American Eider, and this year he told me that this particular bird was identical in all respects with the one shot by his nephew; so the species has occurred before in Great Britain, and the new specimen is not the first occurrence in Europe. On Feb. 22nd we saw, in the Bay of Ireland, near Stromness, a very peculiar female Eider, a single bird, which we hit three times, but failed to bag. She was much smaller than the Common Eider, and was very light coloured, the head appearing to be almost white. I had my glass on her for nearly half a hour before we came up to her. as the wind had dropped completely, and could not make her out at all; neither could either of my boatmen, the Sutherlands, who are professional fowlers, and have shot hundreds of Eiders. What was she? is it possible that she was the widow of the late lamented Pacific Eider drake?—H. W. ROBINSON (Lansdowne House, Lancaster).

Smew (*Mergus albellus*) in Cheshire.—On March 5th, when with a friend I was watching the wildfowl on Oulton Mere, we detected a Smew among a party of Pochards and Tufted Ducks. The bird at a distance looked like one of the smaller Grebes, for it moved at a great pace through the water, swimming so low that its shoulders were often

awash, and repeatedly dived in a clean Grebe-like fashion. Its association with the Tufted Ducks and Pochards was merely fortuitous, and presently it left them and swam, diving as it went, towards two Golden-eyes—an old drake and a brown-headed bird—that were feeding in another part of the mere. Some Mallards standing on the bank rose at our approach, and alarmed the other fowl, which all got on the wing. The Tufted Ducks and Pochards soon settled again on the water, but the Golden-eyes, always wilder and more wary than other Diving Ducks, after flying up and down the mere once or twice with the Smew in their company, made off in the direction of another sheet of water a mile away. When we reached this place the Golden-eyes were not to be seen, but the Smew had joined a covert of Coots. It moved about the pool, fishing intermittently, and we were able to watch it for some time at close quarters before it arose in alarm and returned to the mere. It was an immature grey-backed bird, with reddish brown head and hind neck and white cheeks; from its small size when contrasted with the Tufted Ducks on the wing, we concluded it was a female. In flight the broad lozenge-shaped white wing-spot was very conspicuous. The bird flew very rapidly, and more than once made an oblique downward plunge similar to the aerial dive of a Teal. Mr. H. E. Forrest tells me that a Smew, shot on Marbury Mere, near Whitchurch, on Jan. 27th of this year, was sent into Shrewsbury for preservation. It is a male in immature dress, probably a bird in its second winter, as it shows a good deal of white in its plumage. This species is rare inland in Cheshire, and I only know of one occurrence previous to this year. An immature example preserved in a local collection is labelled “Tatton; shot with another in hard frost, January, 1867.”—CHARLES OLDHAM (Knutsford).

Varieties of Moorhen and Blackbird.—At the end of December last the anomaly of a white Blackbird was shot in the neighbourhood of Christchurch. It was a mature male, and its whole plumage was of a spotless white, except the tip of one of its outer tail-feathers, which was dusky. The circles round its eyes and its beak were a bright lemon colour, but its eyes were normal, and its legs very little lighter than in an ordinary dark specimen. On previous occasions I have seen immature specimens of both Blackbird and Thrush wholly white, but they invariably had pink eyes, and their legs were much lighter than usual. About the middle of January a peculiarly dappled Moorhen was shot near here, and kindly given to me. It was a very large bird; the head, neck, and breast were of the usual dark colour, but from the shoulders to the tail it had more white than black about it,

the under parts and some of the larger quill-feathers of the wings being wholly white, one of the wings, when expanded, having the peculiarity of black and white quills alternately. Its legs were of the usual greenish hue, the red garters appearing very conspicuously, but not more than the well-developed nails, which were quite white, but have since faded to a dull pale green. My experience is that this common bird is not so often seen with white feathers in its plumage as some other species are; and, having showed my specimen to several men whose life-work has been near the river, and to whom the Moorhen is probably the most familiar bird, I was told that none of them ever saw a specimen anything like it.—G. B. CORBIN (Ringwood, Hants).

Nesting of the Lapwing (*Vanellus vulgaris*).—Referring to Mr. Kelso's notes on the nesting of the Lapwing (*ante*, p. 108), I have turned up his reference in the 'Transactions of the North Staffordshire Field Club,' which is to be found in the volume for 1895, p. 48. Mr. R. H. Read supplied me with notes describing the two Lapwings' nests in question, which were raised "quite ten inches high; . . . no doubt" (as Mr. Read said) "the birds were guarding against inundation of the nest if the water in the reservoir rose higher." The ground was not particularly wet, but subject to inundation after storms. The reservoir is one of the Water Company's store reservoirs.—JOHN R. B. MASEFIELD (Rosehill, Cheadle, Staffordshire).

Curlew-Sandpiper on the Dee Marshes in February.—On Feb. 19th, Mr. C. Oldham and I watched a Curlew-Sandpiper (*Tringa subarquata*) on these marshes; it was in very grey and white winter plumage, a conspicuous object on the grass. There was a strong westerly breeze on that day, with a high tide, and the bird was sheltering head to wind in a slight depression in the turf, its dark coloured decurved bill showing plainly as it moved its head continually from side to side watching us. Though not uncommon as a passing visitor in the Dee and Mersey estuaries in autumn, it is, however, very unusual to meet with one in winter in this district, and the occurrence is therefore worth recording. Perhaps in this case the bird had been prevented by injury from leaving at the usual time, or possibly it had been induced to remain on here by the mild weather and a plentiful supply of food. We did not actually see the bird fly, but it could run well, and had no appearance, so far as we could see, of being in the least degree wounded. In 'The Zoologist' (1904, p. 66), Prof. J. H. Salter, in his "Ornithological Notes from Mid-Wales," states that Mr. Fielden saw a flock of about thirty Curlew-Sandpipers on the golf-links at Borth on Feb. 10th, 1902. It would be interesting to know what was the plumage of these

birds at that date ; also if there is any evidence to show that they ever pass the winter on that coast. On Oct. 9th, 1904, Dr. W. H. Dobie and I saw one of these birds feeding in company with a Dunlin by the side of a gutter on the Dee marshes. This one was much darker than the bird seen in February, somewhat resembling, as they do at this time of year, a Dunlin in winter plumage. It was absurdly tame ; several times we put it up, but it invariably returned to the same spot, after flying round in a circle (the white tail-coverts being then very obvious), or moved across to the opposite bank, a few yards distant. The note, uttered when in flight, is more of a trilling sound, and more continuous than a Dunlin's cry. When feeding the bill is inserted sideways or diagonally (not vertically) in the ooze or mud, very much like that of a Curlew or Whimbrel.—S. G. CUMMINGS (Chester).

Wildfowl on the Hampshire Avon during the Winter of 1904-05.—The past winter was almost the exact opposite of its predecessor in the amount of rainfall, and consequent flooding of the meadows near the river—in fact, at times the water was as low as it often is in the middle of summer ;* yet, notwithstanding this apparent drought, an extraordinary number of wildfowl visited the neighbourhood, especially Wigeon and Teal, the latter particularly affecting the shallower parts of the river, where they feed ; but both species, ever alert and on the watch, were hard to approach, and once on the wing were far more cautious of again alighting than any locally bred fowl, for, although the Teal generally are best to keep in line of the stream, the Wigeon, after being shot at, get up to a great height, and make off towards the sea. The number of home-bred species, as Wild Duck, Coot, &c., were greatly augmented by migrants, although as a whole the winter was mild and comparatively open. Considering the lowness of the water, and consequent easy access to the river-banks, it is no great wonder that record " bags " have been made, taking the season as a whole. On one shooting considerably over one thousand head (including Coot and Moorhen) were accounted for, but it should be remembered this was the produce of four or five separate days of sport, whereas in the previous winter between four hundred and five hundred head were taken in a single day, but on that occasion, I believe, the number of guns was greater. In point of numbers killed, the Wild Duck (*Anas boscas*) heads the list on this shooting, and it should be mentioned none were hand-reared ; nearly five hundred were taken, over two hundred Wigeon, and about half the number of Teal. I am glad to say the Pochard has again returned to some of its old haunts, where

* The River Mole, in Surrey, was in this condition throughout the winter.
ED.

for many years it was almost entirely absent; about a dozen were killed on one shooting, and undoubtedly the Shoveler has been more frequent for the last few winters than it was previously, and I should not be surprised if a few pairs remain in the vicinity the whole year, although from personal observation I cannot establish the fact of the nest having been found. Several Gadwall, a few Pintail, Golden-eye, and Tufted Duck, all in various stages of immaturity, were met with, and one almost mature male Goosander was killed at the old spot, where for years it had disappeared, but was formerly an annual visitor in some numbers. Several Bittern were seen, but I am glad to say I know of but one being shot. A somewhat curious incident occurred at one of the shootings; a Mallard, at a considerable height, had been shot, and in its fall collided with a Coot that was on the wing, and, breaking the Coot's back, killed it at once. Whilst on the subject of wildfowl, I may note that a most unusual number of Woodcock visited the neighbourhood of the woods and heaths of the vicinity, and I should suppose record "bags" must have been made on several of the shootings situated in favourable localities. I was informed that two guns secured twenty Woodcock in one day, and, my informant added, "and ought to have been double that number." I understand that this much esteemed bird was also unusually abundant in the forest, but I have no means of ascertaining the sport experienced; let us hope more birds than usual will remain to nest in that locality. Is there not a grain of superstition—appertaining to good or ill luck—in the habit of some sportsmen cutting off this bird's legs, or is it merely to withdraw the tendons from the "Woodcock's thigh," that limb so dear to the epicure's palate? Also, what is the supposed reason that some Dogs will not retrieve a Woodcock, although they will hunt and "flush" it. Is it a peculiar scent the bird has? A sporting friend of mine once had a valuable Dog that would retrieve almost anything, but on two separate occasions it quite refused to touch a Green Sandpiper (*Totanus ochropus*), and any person who has handled that pretty little species must have detected the peculiar smell it has.—G. B. CORBIN (Ringwood, Hants).

Notes on the Ornithology of Richmond Park, Surrey.—

KESTREL (*Falco tinnunculus*).—On Feb. 26th saw three—one in the Sidmouth Plantation, and two hunting for prey in the vicinity of the Penn Ponds.

TAWNY OWL (*Syrnium aluco*).—Numerous.

CUCKOO (*Cuculus canorus*).—Fairly numerous in the summer months.

GREAT SPOTTED WOODPECKER (*Dendrocopus major*).—Very rarely seen; have only two records—one on May 19th, 1904, near Robin

Hood's Gate, and the other on Aug. 28th, 1904, in the enclosure at the head of the Penn Ponds.

LESSER SPOTTED WOODPECKER (*D. minor*).—More numerous than its ally, but is not conspicuous, and therefore apt to be overlooked. It is more often heard than seen.

GREEN WOODPECKER (*Gecinus viridis*).—Common compared to the last two species.

WRYNECK (*Tijnx torquilla*).—Generally met with in the summer months.

NIGHTJAR (*Caprimulgus europæus*).—Very numerous. Regularly breeds in the enclosures.

SWIFT (*Cypselus apus*).—Common during its stay with us.

CARRION-CROW (*Corvus corone*).—A few individuals seem to stay regularly in the Park.

ROOK (*C. frugilegus*).—Common.

JACKDAW (*C. monedula*).—Same as preceding species.

SPOTTED FLYCATCHER (*Muscicapa grisola*).—Numerous. Summer visitor.

MISTLE-THRUSH (*Turdus viscivorus*).—Frequently met with.

SONG-THRUSH (*T. musicus*).—Common.

BLACKBIRD (*T. merula*).—Common.

FIELDFARE (*T. pilaris*).—Occasionally met with.

WHEATEAR (*Saxicola oenanthe*).—Numerous. Summer visitor; breeds on the open spaces.

WHINCHAT (*Pratincola rubetra*).—Numerous. Summer visitor. Breeds.

STONECHAT (*P. rubicola*).—By no means common. Have but few records.

REDSTART (*Ruticilla phæniceus*).—Numerous. Summer visitor.

ROBIN (*Erithacus rubecula*).—Common.

NIGHTINGALE (*Daulias luscinia*).—Fairly numerous, but by no means common.

WHITETHROAT (*Sylvia cinerea*).—Numerous.

LESSER WHITETHROAT (*S. curruca*).—Rare. Have only distinguished this species three times.

BLACKCAP (*S. atricapilla*).—Numerous.

GARDEN-WARBLER (*S. hortensis*).—Fairly numerous.

GOLDCREST (*Regulus cristatus*).—Very rarely met with; have but two records.

CHIFFCHAFF (*Phylloscopus rufus*).—Fairly abundant.

WILLOW-WARBLER (*P. trochilus*).—More numerous than the last named.

- WOOD-WARBLER (*P. sibilatrix*).—A few pairs met with annually.
- HEDGE-ACCENTOR (*Accentor modularis*).—Common.
- WREN (*Troglodytes parvulus*).—Abundant. Noticed one running up a tree-trunk, after the manner of a Tree-Creeper, on Feb. 26th, 1905.
- RED-BACKED SHRIKE (*Lanius collurio*).—Met with now and again.
- BRITISH LONG-TAILED TITMOUSE (*Acredula rosea*).—Fairly abundant, and sometimes met with in families, especially in the winter months.
- GREAT TITMOUSE (*Parus major*).—Common.
- BRITISH COAL-TITMOUSE (*P. britannicus*).—Rather rare.
- BLUE TITMOUSE (*P. caeruleus*).—Common.
- MARSH-TITMOUSE (*P. palustris*).—Rare.
- NUTHATCH (*Sitta cæsia*).—Rather numerous.
- TREE-CREEPER (*Certhia familiaris*).—Not quite so numerous as the last named.
- PIED WAGTAIL (*Motacilla lugubris*).—Common.
- YELLOW WAGTAIL (*M. raii*).—Very numerous in the summer, and breeds plentifully in the bracken.
- MEADOW-PIPIT (*Anthus pratensis*).—Rather uncommon.
- TREE-PIPIT (*A. trivialis*).—Summer visitor ; more numerous than the last named. Breeds in the bracken.
- SWALLOW (*Hirundo rustica*).—Fairly abundant.
- MARTIN (*Chelidon urbica*).—Same as the Swallow.
- SAND-MARTIN (*Cotyle riparia*).—Sometimes met with hawking for insects over the Penn Ponds. These birds, I believe, come from Coombe Warren, where they breed.
- GOLDFINCH (*Carduelis elegans*).—Rare. Have but one record—September, 1903.
- GREENFINCH (*Ligurinus chloris*).—Numerous.
- HOUSE-SPARROW (*Passer domesticus*).—Common.
- TREE-SPARROW (*P. montanus*).—Irregular ; met with two on May 19th, 1904.
- CHAFFINCH (*Fringilla cælebs*).—Common.
- LINNET (*Linota cannabina*).—I have only one record of this species.
- BULLFINCH (*Pyrrhula europæa*).—Have no record of this bird, but I may mention that I have seen it in Kew Gardens.
- CORN-BUNTING (*Emberiza miliaria*).—Have no record of this bird, but have seen it once on Ham Common.
- YELLOW BUNTING (*E. citrinella*).—But rarely seen ; have only three records.
- STARLING (*Sturnus vulgaris*).—Common.
- SKY-LARK (*Alauda arvensis*).—Numerous.
- RING-DOVE (*Columba palumbus*).—Common.

STOCK-DOVE (*C. œnas*).—By no means uncommon.

TURTLE-DOVE (*Turtur communis*).—Numerous summer visitor.

PHEASANT (*Phasianus colchicus*).—Only found in the enclosures.
Not very numerous.

PARTRIDGE (*Perdix cinerea*).—Have but one record of a pair, near Robin Hood's Gate, on June 26th, 1904.

MOORHEN (*Gallinula chloropus*).—By no means numerous; what few there are keep principally to the marshy ground at the head of the ponds.

COOT (*Fulica atra*).—Common. May generally be observed on both ponds.

SANDPIPER (*Totanus hypoleucus*).—Have never seen this species personally. A friend of mine, whose observations may be relied upon, told me that he saw one feeding, in the latter part of 1903, at the side of the largest pond.

LAPWING (*Vanellus vulgaris*).—Have never seen this species actually in the Park.

HERON (*Ardea cinerea*).—There is a small heronry in the Sidmouth Plantation, and birds returning from their hunting-grounds are often seen in the neighbouring district.

CANADIAN GOOSE (*Bernicla canadensis*).—There are about a dozen or so of these birds in a semi-wild state, and a pair succeeded in bringing up two young last year.

MALLARD (*Anas boscas*).—Resident, but numbers are added to in the migration seasons. I may here remark that I have continually seen Ducks perching on the lower branches of trees, and on the posts and rails which surround the island in the largest pond.

TUFTED DUCK (*Fuligula cristata*).—Have only one record of two males and one female on Feb. 26th, 1905. I watched these birds for nearly an hour from different positions, and there was no mistaking them.

POCHARD (*F. ferina*).—Frequently met with, but never staying for any time. On Feb. 26th I counted forty-six, and on the 4th and 5th four.

GREAT CRESTED GREBE (*Podiceps cristatus*).—One pair breeds annually.

It will be seen from the above list that I have observed about seventy kinds of birds in this Park, but more frequent visitors than I could no doubt add to the list. It may not be generally remembered that an Osprey (*Pandion haliaëtus*) was seen at the Penn Ponds, and subsequently killed at Barnes, in 1889; and another one seen in 1898.

No doubt many other rare birds have from time to time been met with, but unfortunately I have not got the means for recalling them.—
L. B. MONRITZ (6, Esmond Road, Bedford Park, W.).

PISCES.

Fecundity of Fishes.—The fecundity of many fishes is well known, and on considering the subject one must be struck with the thought of the countless number of eggs that never reach maturity. In December last a female Perch (*Perca fluviatilis*) of just over three pounds weight was given me for preservation, and on extracting the pouch containing the spawn I found it weighed over nine ounces; the ova were very small, and I suppose, at that season, in an apparently undeveloped state, as I am informed the spawning does not take place before April or May.—G. B. CORBIN (Ringwood, Hants).

[The late Frank Buckland found the number of eggs in two specimens of this fish as follows:—Weight of fish, 3 lb. 2 oz.; eggs, 155,620. Weight of fish, 8 oz.; eggs, 20,592. It is also recorded that upwards of 280,000 have been taken from a half-pound fish (*cf.* Zool. 1899, p. 342.—Ed.)

THE ZOOLOGICAL SOCIETY'S GARDENS.

THE spring always brings interesting additions to the Zoological Gardens in the form of newly-born young. The first to make their appearance this year are three litters of puppies in the Wolf-dens, namely, one of Dingos, one of hybrid Dingo and Wolf, and one of Wolves. The latter were whelped by the American Timber Wolf bitch, who has proved herself in past years a good breeder but a bad rearer of young. Last spring her litter of eight was divided, four being given to a Colley, who raised them successfully, and four left with the mother, who brought up only two. This year also there are eight pups, but, as the result of last year's experiment, two of them are entrusted to the mother, and the remaining six to a foster, who has one of her own pups as well. It remains to be seen which of the two bitches will give the best results. Amongst the Herbivora have been born a young male Eland and a Bactrian Camel of the same sex. The former is the more valuable asset, but too closely resembles the calf of a domestic Cow to be very attractive to the public. The Camel, on the contrary, is a quaint little caricature of his mother, and will well repay a visit.

Naturalists interested in the British fauna will be glad to hear that a Scotch Wild Cat seems to be settling down, and getting reconciled to her quarters, though still very savage and wild. She was trapped near Loch Carron in Ross-shire, and seems to be recovering from the gin-wound to her fore leg. The shy and savage nature of these Cats, coupled with the shock and injury often incidental to their capture, makes them difficult animals to keep during the first few weeks of captivity. In addition to the above mentioned, the menagerie has received on deposit a very fine series of Australian Marsupials, the most important of which are two Wallaroos, a Bennet's and an Agile Kangaroo, a Brush-tailed Wallaby, a Ring-tailed Phalanger, two Short-nosed Bandicoots, and a Brush-tailed Pouched Mouse, the latter a rare and attractive little animal.

At the present time there is perhaps no more attractive exhibit in the Gardens than the Birds of Paradise. Specimens of three species—namely, one of the Greater, two of the Lesser, and two of the King—may now be seen in adjoining cages in the Insect House. One of the Lesser is in perfect plumage, and habitually shows off in the early mornings when the sun shines. These birds do not all belong to the Society, some being on deposit; and, since the series may at any time be broken by the removal of one or more of the specimens, those who wish to see this unique exhibition are recommended to avail themselves of the opportunity.

At the beginning of the year the only specimen of Rhea in the Gardens was the female Darwin's, which last season paired with a male of the Common Rhea, and laid three eggs, which were successfully hatched off in the incubator. As a mate for her this spring, the President has deposited one of the two male Darwin's Rheas that until recently were at Woburn. The Society has in addition procured two pairs of Common Rheas, one pair by purchase, already mentioned in the last number of 'The Zoologist,' and an additional pair presented by Arthur Holland, Esq., on the 8th of last month. The stock of Struthious birds has been still further augmented by a young male Masai Ostrich presented by Capt. J. S. Cavendish.

R. I. P.

NOTICES OF NEW BOOKS.

The Fauna and Geography of the Maldive and Laccadive Archipelagoes ; being the Account of the Work carried on and of the Collections made by an Expedition during the Years 1899 and 1900. Vols. I. & II. Edited by J. STANLEY GARDINER, M.A., &c. Cambridge : at the University Press.

Two volumes of this important publication have been completed, and, though we are promised some supplementary parts, the work may now be considered as a distinct unit in biological literature, and further delay in notice is unnecessary. The expedition to these faunistically unknown archipelagoes—for our knowledge was so slight and incomplete as to be practically of little use—was undertaken by Mr. J. Stanley Gardiner, who left England at the end of March, 1899, in the company of Mr. L. A. Borradaile, a partnership that was soon dissolved owing to an unfortunate attack of sunstroke, which compelled the last-named naturalist to return home. Mr. Forster Cooper subsequently joined the expedition from England, and some amount of the work accomplished may be appreciated when we read that two hundred and seventy-three dredgings were recorded in the Maldives, which were finally left on April 25th, 1900.

Mr. Gardiner has contributed an early memoir on the Coral Reefs of the Indian Ocean, which gives us a firm grasp of the status of the Maldive and Laccadive Archipelagoes. "The soundings, such as they are, although not quite close enough, give strong indications that the belt between Madagascar and India is cut by a depth of over 2000 f. in three places, *i. e.* between the Maldives and Chagos, between the latter and Saya de Malha Bank, and between Farquhar Atoll and Madagascar. These channels divide the coral-reef areas into four sections, which may be termed respectively the Malagasy, Seychelles, Chagos, and Maldive." The Maldive and Laccadive Archipelagoes form a long, narrow belt, extending due north and south

from the level of the Kanara coast of India in lat. 14° N. to Addu Atoll in lat. $0^{\circ} 40'$ S. Mr. Gardiner has exhaustively described these atolls, and has entered fully on the much disputed question of coral formations; in this discussion he has relied very largely on his own observations, and in perusing the statement of his views the reader will find a mass of original observations on the life-histories of many marine organisms.

A considerable number of naturalists have combined to work out the collection, and, as a rule, their contributions are of a more generally biological or philosophical character than bare enumerations of genera and species. We may instance Dr. MacMunn's paper "On the Pigments of certain Corals," in which a conclusion is arrived at that as the dark pigments when in solution have the property of arresting the ultra-violet and violet rays of light, they may probably act as a screen, protecting the delicate organisms from the irritating effects of the rays of short wave-length, and in this way be of considerable physiological importance. In Mr. Borradaile's contribution on "Marine Crustaceans," the reader will find some pregnant remarks on "Varieties and Species," in which conclusions are reached somewhat on the same plane as those promulgated at about the same time by Mr. Bateson. These communications must be taken as representing the main scope and method of other valuable memoirs by different writers, to which our space will not allow further reference to be made; and no reader or student will fail to be struck with the advanced biologic method that permeates the pages throughout.

Catalogue of the Noctuidæ in the Collection of the British Museum.

By Sir GEORGE F. HAMPSON, Bart. Published by the Trustees of the British Museum.

THIS constitutes the fifth volume of the "Lepidoptera Phalænæ," and is devoted to the *Hadeninæ*, the second of the fifteen subfamilies of the *Noctuidæ*, and contains the descriptions of 946 species belonging to 78 genera.

Should the author complete this great publication—as we hope he will—the work of a lifetime will have been expended in the production of a classic in Lepidoptera. Only those who

have engaged in similar labours can fully estimate what it involves to unravel the tangled synonymic skein of an immense and difficult family of moths such as the *Noctuidæ*, and at the same time to revise the genera throughout, especially when the generic revision is of a constructive and not a purely destructive character. The wholesale "lumping" of genera, as sometimes practised, frequently causes as much, if not more confusion than their occasional almost impractical subdivision; while, on the other hand, a "lumping" of many so-called species, and a stricter analysis in genera, frequently advances a more real appreciation of the composition of a difficult and involved group of animals, either high or low in evolution. We think that Sir George has been happy in his treatment of this problem in the present volume; in the old genus *Polia* he has included many species hitherto placed under *Mamestra*, and in other generic creations; whilst he has not hesitated to propose new generic divisions for other species belonging to the same extensive group. Even the British lepidopterist will find some change in generic nomenclature, and much guidance and considerable clearance has been effected with the Nearctic species. The author has generically revised some of his former work, as well as that of other entomologists, and we feel that it is almost as impossible for the entomologist as the pietist to reach perfection; at least we can aim at that ideal, and this book is a very advanced attempt at doing so. An atlas with eighteen coloured plates accompanies the volume.

Our Country's Animals, and how to know them. By W. J. GORDON. Simpkin, Marshall, Hamilton, Kent & Co., Lim.

WE have already noticed several volumes of this series, and in the present issue Mr. Gordon has written on the Mammals, Reptiles, and Amphibians. The treatment is exactly that pursued by the author on previous occasions, and will doubtless prove useful to the many who desire to know the names of British animals, but do not possess other publications on the subject. The illustrations are to the point of recognition, if not artistic; but we are much struck with that representing the Otter, which depicts that animal having the audacity to not only seize a Perch, but also over its formidable dorsal fin!

EDITORIAL GLEANINGS.

ADOLPHE BOUCARD, a well-known naturalist and traveller, died on the 15th March, in his sixty-sixth year, at his residence at Hampstead. His name is principally connected with Central America, where he made more than one natural history expedition. His first journey appears to have been made in 1851, when he visited Mexico, Nicaragua, and California. His last expedition was undertaken in 1877, and was directed to Panama, Costa Rica, Nicaragua, and Guatemala. Ornithology and entomology were his favourite studies, especially the first, on which he published a number of memoirs. His 'Genera of Humming-birds' was published in 1895, and in Costa Rica he discovered a new genus and species of these birds—*Arinia boucardi*, Muls., only recently rediscovered by an American collector. A few years back he presented a fine collection of bird-skins—some twenty thousand specimens—to the Paris Museum, and a very large number of duplicates to an American museum. Of recent years he was less familiar to collectors, but formerly was a well-known dealer in London. He was the recipient of many honorary degrees, and was much respected. For the above particulars we are largely indebted to Mr. W. F. H. Rosenberg.

THE Fourth International Ornithological Congress will be held in London under the presidency of Dr. R. Bowdler Sharpe, and will extend from June 12th to 17th. The Secretaries are Dr. Ernst J. O. Hartert, of Tring, and Mr. J. L. Bonhote, of Ditton Hall, Fen Ditton, Cambs. Unless otherwise stated, the meetings of the Congress will take place at the Imperial Institute, South Kensington. An excellent programme is arranged, and the Congress promises to prove a great success.

THE following note by Mr. D. W. Prosser, extracted from the 'Fishing Gazette' of March 11th, is of some importance to those ornithologists who are studying Welsh birds:—

"On Jan. 7th a very interesting article appeared in the 'Fishing Gazette' on a 'Rare Bird shot in Berkshire,' called Y trochydd Mawr.

To those of your readers who do not understand Welsh it might be of interest to know that this 'ancient British name' is Welsh, and means 'the great diver'; the usual Welsh word used for 'diver' is 'trochwr,' the terminals of the masculine noun in Welsh may be 'ydd' or 'wr.' I might further state the verb 'dive' is in Welsh 'trochi'; the noun is formed by adding 'ydd' or 'wr' to the verb 'trochi,' omitting the final 'i.'

Zoological Idealism—In a recent number of 'The Animal World,' Mr. J. M. A. Woods has discussed the question, "Have Animals a future Life?" Of course, by "animals" the author clearly implies animals other than man. He writes:—"A subject like this always finds opposers, because it contradicts the natural pride of man, which makes him anxious to think himself so completely first that none else can share his immortality"; and "We are apt to think of the word 'immortality' as comprising more than its simple meaning—deathlessness." A considerable number of theological and other writers are quoted, and we will confine ourselves to extracts from the last.

Max Müller, in his first series of 'Lectures on Language,' writes:—"It does not follow that the souls of men are not immortal because the souls of brutes are not immortal, nor has the *major premiss* ever been proved by any philosopher, namely, that the souls of brutes must necessarily be destroyed and annihilated by death. Leibnitz, who has defended the immortality of the human soul with stronger arguments than even Descartes, writes:—"I found at last how the souls of brutes and their sensations do not at all interfere with the immortality of human souls; on the contrary, nothing serves better to establish our natural immortality than to believe that all souls are imperishable.'"

Dr. John Brown, in 'Horæ Subsecivæ,' asks:—"Are not these dumb friends of ours persons rather than things? Is not their soul ampler, as Plato would say, than their body, and contains, rather than is contained? Is not what lives and wills in them, and is affectionate, as spiritual, as immaterial, as truly removed from mere flesh, blood, and bones, as that soul which is proper self of their master? And when we look each other in the face, as I look in Dick's, who is lying in his 'corney' by the fireside, and he in mine, is it not as much the dog within looking out from his eyes—the windows of his soul—as it is the man from mine?"

"Knowest thou not," says Milton, referring to the lower animals, "their knowledge and their ways? They also know and reason not contemptibly." And Aristotle: "There are between man and animals

faculties in common, near and analogous." Locke gives it as his opinion: "It is as evident that some animals do in certain instances reason as that they have sense." Schleiden also says: "It is certain that most animals in their several acts show every outward sign of consciousness, or knowledge of the end of their actions, not like the first and uninformed operation of instinct, which is wholly employed in their self-preservation, or in providing for their young."

The author also quotes from Archbishop Trench, Butler, John Wesley, Andrew Baxter, and others; but, in saying "We find human beings (as the inhabitants of the Andaman Islands) actually below some animals in intelligence," he has evidently relied on some old account of these Mincopis, and has not consulted the details of recent anthropology.

THIS subject has also recently engaged the attention of Bishop Thornton, Assistant Bishop of Manchester, who has given his views in the course of an address on "Teachings from the Zoo," delivered at the monthly service for men at Blackburn Parish Church. At the request of a representative of the 'Daily Telegraph,' Dr. Thornton consented to express himself at greater length.

"Brutes," he urged, "have not souls in the popular theology, which speaks of the soul as the exclusive endowment of man; but Scripture uses the very same word for the 'living soul' of the brute as for that of man, reserving the word 'spirit' to denote the special endowment of mankind. The soul of man, by which he hopes and fears, rejoices and sorrows, loves and hates, seems shared by him with the lower animals. It is that in his immaterial nature which hangs suspended between the flesh and the spirit, capable of being dominated, as in brutes, by the animal propensities—capable of being linked up with what is spiritual, immortal, and divine. This soul and spirit are not only not identical, but may be in conflict with one another. The writer to the Hebrews speaks of the 'dividing of the soul and spirit, of the joints and marrow.' Yes, the lower animals have souls, and exhibit what may be called moral qualities. They display sympathy, generosity, courage, or cowardice; they evince pride, jealousy, vindictiveness; they manifest roguery, and what may be called conscientiousness. If there be future reward for brutes, some urge, there must be future punishment, which, for some reason, one feels it impossible to believe. Indeed, the individual brute life is not important enough to demand a future to redress its deficiencies. A horse has fulfilled adequately the aim and ideal of his being if he has served the convenience of man, ministered to his needs and innocent pleasures. That

after death it should minister to the nourishment of his pack of hounds is, on the whole, no inappropriate, or even unworthy, conclusion of his career. As for the moral qualities discoverable in brutes, it is said they have been overrated. There is no touch in these with what is spiritual, divine, eternal. Conscience in brutes amounts to little or nothing more than a fear of punishment, or the hope of sensual gratification.

“ Decision in such a controversy is by no means easy. The problem is akin to that of the probable future of idiots or humans who die in infancy. May there not be degrees in ‘immortality,’ or may re-incarnation be true for the brute? May there not be a generic resurrection in which what is durable in the individual shall be perpetuated only in the mass? It is beyond us to find the answer to these questions. At all events, we cannot consent to infer the immortality of brutes from the absence of essential distinctions between their nature and our own. The line of demarcation may not seem easy to draw in regard to their mental and moral qualities; but may we not draw it at the border between soul and spirit?”

It was stated at yesterday’s meeting of the Yarmouth Harbour Commissioners that, though the Herring fleet represented a capital outlay of a quarter of a million sterling, exclusive of nets and gear that may be estimated at another £50,000, the boats’ accounts for the past year did not show a return of much more than 1 per cent. upon the capital. Yet at Yarmouth last year there were landed no less than 40,599 lasts, or 535,378,800 Herrings, sufficient to provide every man, woman, and child in the United Kingdom with about a score of Herrings each.—*Evening Standard, March 17th.*

THE preservation of birds from a gardener’s point of view is clearly expressed by a writer in ‘The Garden’ (April 8th), and may be read with interest by many who may disagree with the writer’s conclusions. He considers that there is “little escape from the conclusion that the fewer Bullfinches we have in the country the better, and that people who kill seventy or eighty Bullfinches in a winter, as some gardeners do in the south-west, are justified in congratulating themselves upon the performance. The wonder is that there is not such a market for live Bullfinches as should make the shooting of them seem not only unnecessary but wasteful. The bird is very easily trapped, and makes an ideal cage bird. The general question of birds in gardens is full of difficulties, which will become more serious year by year as the birds

multiply, in consequence of the humane attitude which the public has definitely adopted towards them. The mischief which the Sparrow does is always exasperating in spring; but the Greenfinch, who deliberately tears off the blooms from primroses which grow in shady shrubberies, as the Sparrow does from those that grow in the open, might be just as bad if he were equally numerous. The Hawfinch, who was an extremely rare bird thirty years ago, has become too familiar in many places as the arch destroyer of green peas. Crossbills, still regarded in most parts of the country as interesting rarities, are shot at sight in others on account of their absurdly wasteful trick of destroying apples in order to get at the pips.

“There are black marks even in the records of the most useful birds, and, when these multiply, the mischief which they do seems to increase by leaps and bounds out of all proportion to the mere growth of their numbers. In every corner of the country now you hear that the Rook, the “farmer’s friend,” has fallen into evil ways since he began to multiply; and even the Tits, whose general utility in a garden is undeniable, are anathematized by fruit-growers on account of their habit of spoiling quantities of fruit by pecking a hole in each near the stalk. For this damage the often-recommended device of putting pans of water near the trees, with the idea that it is thirst only which impels them to attack fruit, seems no preventive, and the only effective stragem seems to be to enclose each fruit in a bag, or to protect it with a disc of paper round the stalk. But when one considers the average price which a grower obtains for his fruit, one realizes how heavily handicapped he would be if he had to adopt either of these devices against the Tits. The wholesale damage done by Starlings in cherry orchards, and the ravages of many kinds of birds among the bush-fruit and strawberries, are well known to everybody; but only observant gardeners are able to distinguish between the degrees of mischief properly attributable to the different kinds. When, for instance, you find that, as is often the case, boys are encouraged to destroy the nests of Blackbirds and Thrushes indiscriminately in order to protect the fruit, you have proof of ignorance. The Blackbird is undoubtedly more mischievous than useful in a garden during the summer, from the fruit-grower’s point of view, but the reverse is the case with the Thrush. It is only in drought, when snails are hard to find, that the Thrush will raid the fruit; but, when fruit is ripening, the Blackbird will always leave the work of hunting for slugs and worms in order to feast upon it. Year in, year out, the more Thrushes you can have in a fruit or vegetable garden the better.—E. K. R.”

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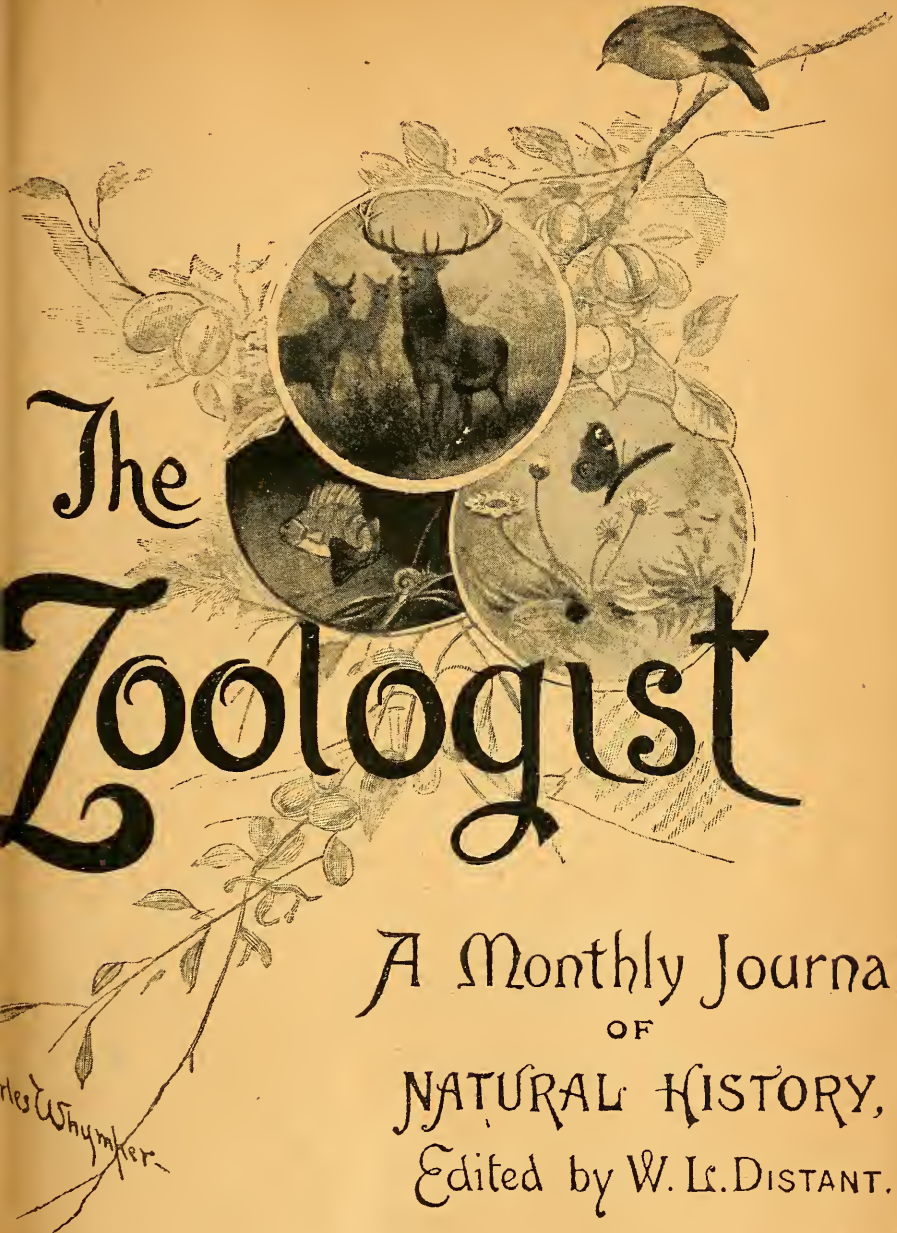
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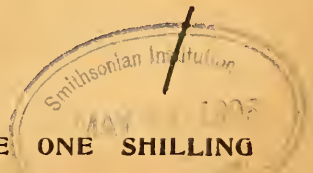
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VIEW OF THE SKELETON OF *Diplodocus*, AS SET UP PRELIMINARY TO SHIPMENT IN THE HALL OF THE WESTERN PENNSYLVANIA EXPOSITION SOCIETY IN PITTSBURG, PA.

THE ZOOLOGIST

No. 767.—May, 1905.

THE LARGEST SKELETON OF A DINOSAUR.

By W. J. HOLLAND, Director of the Carnegie Museum.

(PLATE III.)

ON May 12th, at 1 p.m., Mr. Andrew Carnegie formally presented to the Trustees of the British Museum (Natural History), South Kensington, a reproduction of the skeleton of *Diplodocus carnegii*, Hatcher. The original, of which the specimen in the Natural History Museum is a replica, is in the Carnegie Museum at Pittsburgh. The larger portion of the skeleton represents a specimen which was discovered, in the summer of 1899, on Sheep Creek, Wyoming. In the summer of 1900 a second skeleton, not as complete as the first, was found on land immediately adjacent to that on which the original discovery had been made. In the summers of 1902 and 1903 two other specimens of *Diplodocus* were discovered in the Bighorn Mountains in Wyoming, and out of the material furnished by these four it has been possible for the writer and his associate, the late Prof. J. B. Hatcher, to reconstruct the entire skeleton. What one specimen lacked the other supplied, and, while not every point is as yet absolutely ascertained in relation to the collocation of some of the bones of this colossal beast, it is certain that we know far more about it than is known of the structure of any other similar great creature of the past, unless it be *Iguanodon*

bernissartensis, of which a great many skeletons have in recent years been found in Belgium, some of them in remarkably perfect condition.

The replica installed in the Gallery of Reptiles at the Natural History Museum does not represent, in a single portion, the work of the human imagination, every bone there represented being matched by a corresponding original. In this respect the restoration is unique.

The vertebral column is 84 ft. in length. As it stands in the Gallery of Reptiles the specimen is 80 ft. in length over all, the curves in the vertebral column, as it is mounted, accounting for the loss in length. The height of the specimen, from the top of the base to the top of the spines of the dorsal vertebræ, is nearly 14 ft. The animal possessed a remarkably long neck, and a still more remarkably long tail. The tail, gradually diminishing in thickness, terminated in a long whip-like extremity. It has been interesting to the writer to ascertain, since his visit to England, that *Ceteosaurus leedsi*, portions of the skeleton of which are installed in the Department of Geology at the British Museum, also had a similar whip-like prolongation of the tail, and it is known that this was characteristic of yet two other genera of sauropodous Dinosaurs. What the use of this enormous prolongation of the tail may have been it is only possible to surmise. It is not, however, relatively any longer than is the case in some of the Lacertilia of the present day. The number of caudal vertebræ in the replica is seventy-three. In *Varanus niloticus* there are one hundred and more caudal vertebræ. The skull of *Diplodocus* was, as is true of all the sauropodous Dinosaurs, very small in comparison with the bulk of the animal. The teeth are small, and plainly intended for use in securing vegetable food. It has been suggested that the animal fed upon soft, succulent, aquatic vegetation, which it gathered in the lagoons and estuaries which it haunted. The feet were huge in size, and, as comparative anatomists say, were entaxonic—that is, the longest toes were placed on the inside of the foot. In this respect the feet resemble those of the great Ground Sloths of a subsequent geological period—the *Megatherium* and the *Myloodon*.

The gift of this replica to the British public was made by

Mr. Carnegie, in response to a suggestion of His Majesty, King Edward VII., who, upon the occasion of a visit to Skibo Castle, saw a drawing of the skeleton, and expressed a wish that the huge monster might be represented in England.

The task of producing the restoration occupied the time of from three to four men for two years. The work was done in the palæontological laboratory of the Carnegie Museum by Mr. Arthur S. Coggeshall, the chief preparator, and his assistants. The cost of the making of the restoration, as well as of the bases



Restoration of *Diplodocus*, modelled by Dr. W. J. Holland.

on which it stands, was generously defrayed by Mr. Carnegie at a very large expense.

The specimen is the longest and most perfect representation of a sauropodous Dinosaur in existence anywhere in the world at the present time. The skeleton is nearly twenty feet longer than that of the Brontosaurus, a restoration of which was made in New York recently, and at the first public exhibition of which Dr. Henry Fairfield Osborn kindly invited his friends to meet him at what he facetiously styled a "Dinosaur tea."

DIARY OF OBSERVATIONS ON A YOUNG CUCKOO
(*CUCULUS CANORUS*).

BY J. H. GURNEY, F.Z.S.

May 22nd, 1904.—A boy found a Cuckoo's egg with three Hedge-Accentor's eggs in nest in a thorn-hedge near my house at Keswick (near Norwich), very convenient to keep under observation. As I had never before had such a good opportunity, I determined to institute a close watch, and see what events would follow.

23rd.—Probably the Cuckoo has already removed one or two of the Accentor's eggs, yet a search into and under the hedge shows no signs of them. The Cuckoo's egg is of an ordinary brown type, as usual not bearing the slightest resemblance to the Accentor's eggs.

30th.—The Accentor has been sitting hard since the 22nd, and it has not been thought safe to put her off more than once a day. The cock Accentor appears occasionally, but no Cuckoo has been seen in the vicinity of the nest, although an old male Cuckoo is often to be heard calling about half a mile away.

31st.—One Accentor's egg is hatched, but the young one has disappeared, and the shell of its egg too, carried away perhaps by the old Accentor.

June 2nd.—8 a.m. First visit to the nest: the Cuckoo's egg is hatched, and its tiny occupant probably already three or four hours old. The two remaining Accentor's eggs are hatched also.

12 a.m. At midday I put off the Accentor for the purpose of examining the Cuckoo. It was entirely devoid of down, of which the nestling Accentors had already considerable tufts on their heads, and seemed very helpless as it lay with its head under the young Accentors. Nevertheless,

when whistled to, it gradually unfolded its long, thin, trembling neck, and opened, in expectation of food, a fairly capacious mouth, which was pale yellow without any spots on the palate. Its skin was everywhere creased and wrinkled, and rather shiny, and it had no hollow in the back. Having made these observations I quickly withdrew, lest the Accentor should forsake her nest.

3rd.—7.15 a.m. Accentor on the nest.

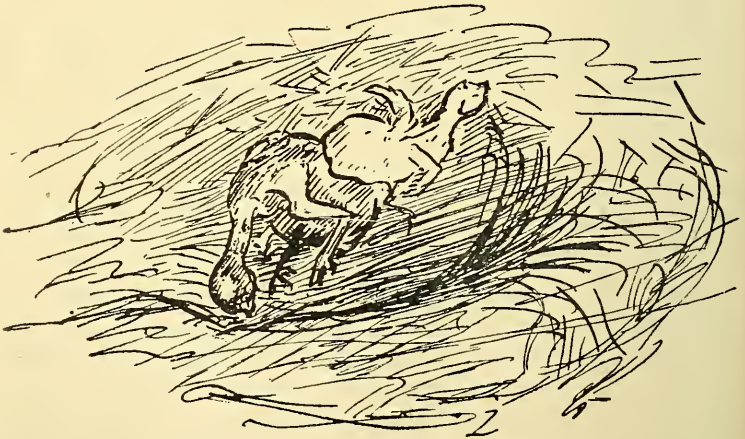
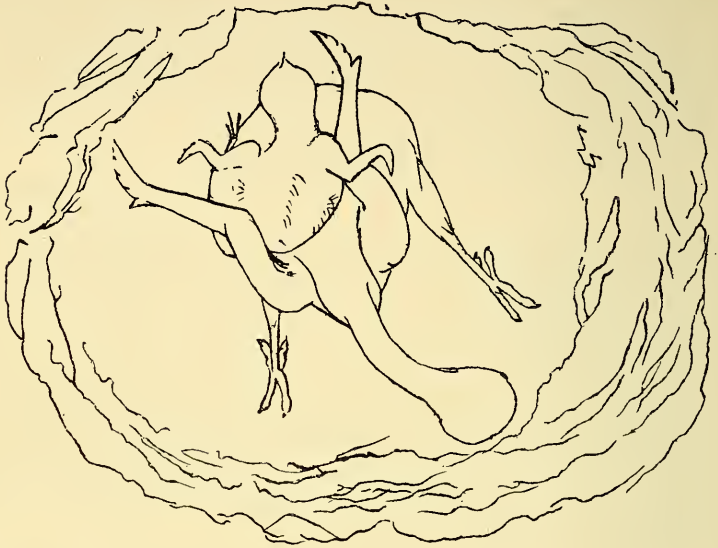
7.45 a.m.	„	„	, but her position changed.
8.15 a.m.	„	„	Changed again.
8.45 a.m.	„	„	„
10 a.m.	„	„	„
12 a.m.	„	„	„

At each visit the Accentor was found to have changed her position to the left; perhaps these repeated changes were to distribute the warmth of her body more equally. On the last visit her body was bunched up in rather a curious way, but what this meant I do not know.

12.30 p.m. For the first time the Accentor had voluntarily left her nest, and, to my surprise, the young Cuckoo was its only occupant. Both the young Accentors lay dead on its edge side by side, but they had evidently been dead only a short time, I am disposed to think not half an hour.

I replaced one of the Accentors in the nest, and watched five minutes, but the young Cuckoo, though very restless, made no attempt to eject it, although it felt it with its wings. The Accentor's nest was rather a deep one, and this and the helplessness of the young Cuckoo, and the fact that the depression in its back was only just perceptible, made me wonder if it was the old Accentors which had ejected their own young; but perhaps not, for the nestling Cuckoos so carefully watched by Dr. Jenner (Phil. Trans. R. S. 1788, p. 225), and Mr. J. Hancock (Trans. North. and Dur. N. H. S. viii. p. 210) ejected young Accentors when they were less than twenty-four hours old in their presence, and my Cuckoo was already at least thirty-two hours. It is clear therefore that it had the power to have done it. Dr. Jenner

even cites an instance of a Cuckoo only two days old which threw out an Accentor seven days old (*l. c.* p. 228, note), which



Cuckoo ejecting nestling Wren.

seems extraordinary; but Jenner is apparently speaking from his own observation in the matter, and the rest of his account is

so admirable that one cannot suspect him of error. An Accentor's feather lay on the hedge by the nest, but there was no evidence of the presence of the old Cuckoo, or of any scuffle, which is said sometimes to take place.

4th.—7.45 a.m. For experiment, I put a Pied Wagtail's egg into the nest, but the young Cuckoo, though very restless, made no attempt to eject it.

7.55 a.m. Removed the Wagtail's egg, and put into the nest a very young live Linnet, whose presence the Cuckoo obviously disliked very much, but it made no attempt to eject it, though hardly ever still, crawling round and about its nest by the aid of its wings, which must possess an extraordinary degree of sensibility, and are used like a child's arms.

2 p.m. Put off the Accentor, and introduced a lively young Wren into the nest, which the Cuckoo immediately



Young Cuckoo's wing on the fourth day.

commenced proceedings against, working round and about it until it had got the bird on to its broad back, in which position the Wren was kept by means of the Cuckoo's long and muscular wings. Then, planting its zygodactyle feet well apart, the little Cuckoo drew itself up until it stood, and three times hoisted the Wren nearly on to the edge of the nest, while my daughters made sketches of the performance. As there are some slight differences in their drawings, it may be well to reproduce both of them.

The young Cuckoo's colour is now slaty brown—in fact, nearly black—very different from the pink flesh tint which Gould has given it in his 'Birds of Great Britain,' which is very incorrect. The *alula spuria*, or bastard wing, has largely developed (see sketch), and its back has grown broader. Its age is about seventy-seven hours.

5th.—8 a.m. Again put the young Wren into the nest,

which the Cuckoo at once hoisted up as before and almost ejected.

2 p.m. Once more put the young Wren into the nest, which the Cuckoo at length got under, and tried to eject, but this was its last performance. As it was only about three days and ten hours old its desire for ejecting other nestlings ceased much sooner than in some of the young Cuckoos experimented upon by Dr. Jenner (*l. c.* p. 226), but it is not to be supposed that strength and vigour is the same in all Cuckoos.

6th.—The Cuckoo, now about four days four hours old, and still the same black colour, is growing fast. The rapidity of its growth is all the more marvellous when one considers the smallness of the egg it has come from—a smallness which must be of great utility to Cuckoos in reconciling the dupe to the charge of their eggs. There is no longer any perceptible cavity in its back, but the creases on its skin are as noticeable as on the day when it was hatched.

7th.—The young Cuckoo now almost fills the nest; its eyes are beginning to open, its ear apertures are large, and the skin of its head and back is blacker than ever. The Accentor is very reluctant to feed it in my presence.

8th.—Weighed the Cuckoo; it is $1\frac{1}{4}$ oz., and is nearly covered with sprouting quills. Its rate of growth has been nearly double that of some young Wrens and Linnets, which after all is not much to be wondered at, for it probably receives the food of five birds.

9th.—The dead nestling Accentor which has been lying beside the nest since the 3rd has disappeared. To see what would happen, I put the other dead Accentor into the nest, but in a few hours it also had gone. To-day, for the first time, an adult Cuckoo was sitting within about forty yards of the nest.

10th.—The young Cuckoo is now old enough to strike at an intruder, an instinct presumably intended to terrify predacious animals, which in some cases might be drawn to the nest by the scent of the dead nestlings. Its appearance at such times is most ferocious, and is eminently calculated to excite fear; even a boy will instinctively draw his hand back, and a Mouse or a small Rat would be frightened away.

16th.—The eyes have now a distinctly sunken appearance, in part due to the erectile feathers of the Cuckoo's head, not noticeable in other birds.

17th.—The Cuckoo experiences a difficulty in breathing, every respiration it takes being distinctly perceptible.

18th.—For the last few days the Cuckoo has changed its position.

22nd.—The Cuckoo, aged twenty days, quitted the nest this afternoon.

23rd.—The Cuckoo nowhere visible, nor was it ever seen again by me.

SUPPLEMENTARY NOTES ON THE ORNITHOLOGY
OF LLEYN.

BY O. V. APLIN, F.L.S.

A GREAT IMMIGRATION.—On the night of the 17th (or rather about one o'clock in the morning of the 18th) March, 1904, a most remarkable migration and destruction of birds took place at Pwllheli. I have drawn up the following account of it from two newspaper reports, and letters from a resident whose husband was at work in the quarry at the time, and from the keeper of St. Tudwal's Lighthouse. The wind was north-east and the night fine at Pwllheli, but at St. Tudwal's the weather was what they call "misty rain," *i. e.* bordering on a fog. The men in the quarry on the Gimblet Rock (Careg yr Imbril), at the entrance of Pwllheli harbour, were working extra time loading vessels, and flares were burning which lit up the whole place. This island-like rock juts out to some extent from the coast-line, and from its height is a very noticeable feature in a long stretch of low coast. Suddenly the workmen were startled by what some have termed a "flow of birds," and others a "shower," descending on the rock. "Thousands of birds dropped on the quarry, the rock, the wharves, and the vessels close to, in a dying state. In a short time the ground was thickly covered with birds, most of them dead or in a dying condition, whilst a cloud of birds hovered in a helpless condition a few yards up in the air. At daybreak the seashore was found strewn with hundreds of birds, evidently drowned at sea, and washed ashore by the tide." This account states that it was an inky dark night, and notices a theory that the birds struck the Rock, which would be between the sea and the place where the flares were burning. Another account said that a shower of birds suddenly fell on the workmen. "Thousands of birds covered the ground in a few minutes—some dead, some half-dead. The vessels at anchor close to the wharf appeared to be instantly covered by birds from stem to stern, every available

space on the riggings, stays, crosstrees, and yards being occupied." Dead birds were found in every direction. "At daybreak the birds on the vessels flew away. Upon inspection there were thousands of dead birds in the quarry, on the top of the Rock, and on the stretch of land that reaches from the Gimblet Rock in the direction of the South Beach." Many of the birds were injured about the head, and there is no doubt but that, having lost their bearings in the thick dark night, and being attracted by the light of the flares, numbers of them struck against the precipitous seaward face of the Rock and other obstacles, while others more fortunate settled down within the influence of the light. The quarryman's wife, writing to me, said:—"On the morfa thousands stood on the rigging and the ropes of the vessels, and they say it was a very grand sight to see the glittering colours in the light. . . . There were birds of every description. Most of them that were on the vessels flew away at daybreak." She adds that there had been a great gale on the Irish coast a day or two before, which did not reach Pwllheli, but the weather came very foggy. As I did not hear of the event until a fortnight after it happened, I had no opportunity of examining any of the victims; but the following species were mentioned in the papers:—Starling, Thrush, Blackbird, Snipe, Woodcock, Robin, Curlew, and Kingfishers; the last named seems a very unlikely one to occur in such a way, and possibly a mistake was made. At St. Tudwal's Lighthouse the same night they had lots of Starlings, Blackbirds, and Redwings about the light, but saw no other birds; there were, however, more Blackbirds than the keeper ever saw at one time previously. He notices that the Starling strikes more frequently than any other bird.

RICHARDSON'S SKUA.—Dr. A. M. McAldowie, of Stoke-on-Trent, writes me word that he saw a white-breasted adult of this species near the Gimblet Rock, Pwllheli, on June 23rd, 1901, the morning after a storm. Also that in June, 1903, he found a dead specimen on the beach near Pwllheli, which, with Puffins and Razorbills, had apparently been washed up in a storm some time previously.

FIRE-CRESTED WREN.—At the sale at Stevens's (May 12th, 1904) of the final portion of the collection formed by Mr. E. Bidwell, lot 244 consisted of a Firecrest, male, March 24th, 1878,

near Pwllheli, and stated in the catalogue, but erroneously, to be the only Welsh-killed specimen.

PUFFIN.—The evidence that the Puffin formerly bred on Bardsey, to be found in Ray's 'Itineraries,' is certainly stronger than I thought it was. Ray and Willughby were both at Bardaron, and crossed over to Bardsey ("a pretty little spot, rented for £50 per annum") on May 29th, 1662; and the former states: "There build the Prestholm puffin, sea-pies, and some other birds." He doubtless knew the Puffin by sight, for just a week before he had landed on Puffin (or, as he calls it, Prestholm) Island, he records that "in the island (Prestholm) are bred several sorts of birds, two sorts of sea-gulls, cormorants, puffins, so called there, which I take to be *Anas arctica clusii*, razor-bills and guillems, scrays two sorts, which are a kind of gull." Scrays are Terns—"a name, I conceive, framed in imitation of their cry: For they are extraordinarily clamorous" (*vide* Willughby's 'Ornithology'). When at Pwllheli, Ray records that "They have a tradition in Wales about the puffins, that they cannot fly if they be out of sight of the sea-water; their wings are very small, and yet they fly swiftly, but seldom very high." C. F. Cliffe, who in or slightly earlier than 1850 visited Bardsey, says that the very precipitous seaward face of the hill on the north-east was "in summer a great resort of puffins and other sea-birds." But, although Cliffe often mentions the sea-birds of Wales, there is nothing to show that he had any especial knowledge of ornithology. If the birds were only seen at a distance it would be easy for a casual observer to mistake a row of Guillemots or those birds on the sea for Puffins, the name of which, then as now, seemed to come more readily to the local people's mouths than those of the other Auks. Bardsey, of course, might have held a Puffin-warren in the latter half of the seventeenth century (though I do not think it very likely), and been afterwards deserted. But I cannot understand how, if the birds were there as late as fifty years ago, I never heard anything of them. Still it may have been so. Information does not come readily to an Englishman from people who talk little of his language, and dislike it also. Ray, indeed, great naturalist that he was, always concerned himself more with plants than birds, and it is interesting to find that he noticed the abundance of the pretty

little Vernal Squill, still one of the attractions of Bardsey and the cliff-tops of Lleyn, which would have been in full bloom at the time of his visit. "We found," he writes, "a kind of *Hyacinthus stellatus vernus* growing there in great plenty."

I was in Lleyn for a day at the end of May, 1903, and went to the Bird Rock. I saw nothing new there, but was able to realize from what took place there during a couple of hours, the amount of plunder, robbery, and violence which goes on at a great (and mixed) breeding station during the season. The Kittiwakes and Guillemots were just laying, and, just as I was pointing out a green egg of the latter to a companion, a Herring-Gull alighted on the ledge and carried it off. I saw another waddle along a ledge and clear out the eggs in a Kittiwake's nest; and on the flat-topped stack a Cormorant seized a Guillemot by the neck, and, after shaking it like a Rat, and beating its life out and hammering it on the rocks for some time, flew out with it and settled on the sea, probably in order to try and wash it down. We could not see if this was a success, but heartily wished the Cormorant might be choked. The numerous Jackdaws passing to and fro doubtless keep an eye open for any egg they can snatch; and, unless they are much better behaved than their relatives in the midlands, I should fancy that a pair of Crows which haunt the rock must be a considerable cause of anxiety to the paler-coloured part of the population. Still, they can hardly be worse than some of the "beautiful harmless white-winged" Gulls, and one almost wonders that, knowing their own and their friends' characters, birds should like to be such near neighbours. But the robbery here is probably like the jobbery in some other assemblies; they are all in it, and so none complain.

The country in Lleyn was much more forward than in Merioneth. I saw two Bullfinches at Bodfean, and heard a Blackcap there, and more than one Chiffchaff; also the Grasshopper-Warbler at Nevin. There were young Swans in the nest by the bridge near Pwllheli. On the edge of the Afon Wen mere we saw, from the train, a Common Sandpiper, and I think it very probable that the bird breeds there.

NOTES OF BIRDS OBSERVED AT BALBRIGGAN IN
1903-04.

By REV. CHARLES W. BENSON, LL.D., Rector of Balbriggan.

BALBRIGGAN is a maritime town, twenty-two miles north-east of Dublin. It owes its origin to the late Baron Hamilton, who in 1780 built the pier and breakwater which enclose its small harbour, admitting steamers drawing twelve feet of water. Its population is 2443, most of whom are engaged in the manufacture of the stockings which have made the town famous.

Balbriggan is said to be the driest town in Ireland, and it is certainly a very healthy and bracing place, and were there only greater bathing facilities it would become a favourite summer resort. The view of the Mourne Mountains in clear weather is really magnificent, and the Isle of Man, sixty miles away, is sometimes, though rarely, visible. The shore is low and shingly, though to the north there is a splendid strand as far as the mouth of the Boyne. Inland the country is very flat and rather treeless, so that one cannot expect a large avifauna.

In my two years here I have only observed ninety-eight species, and I fear that I shall not much increase this number. Mr. Spencer, of Tramore, Co. Waterford, tells me that he has observed 141 there, which I should think almost a record for Ireland; but when I was at Horsey Broad, near Martham, Norfolk, years ago, I was told by Mr. Risings that their fauna reached 158. This seems marvellous.

A short distance from the town a shingly beach, covered at high water, extends out some distance from the land, and is called the "Long Leg." It is frequented by crowds of birds, especially in the evenings, when the tide has gone down a little. Five species of Gulls, Cormorants, Curlews, Oystercatchers, Red-shanks, Dunlins, Ring-Dotterels seem to dispute every inch of the peninsula with Rooks, Jackdaws, Lapwings; whilst at sea, not far away, the Scoters and other Ducks seem to be always swimming in little groups of four or five.

About six miles at sea is the rocky island of Rockabill, lat. $53^{\circ} 35' 47''$, long. $6^{\circ} 0' 20''$, exhibiting a flashing light at a height of 148 ft. above high water, visible eighteen miles. A few miles further south is the large island of Lambay; this island has lately been purchased by Hon. Mr. Baring, who will strictly preserve all bird-life there; so that probably there will be a return of many rare birds which formerly bred there. Indeed, I am informed that for the first time for years past the Common Tern bred there in 1904.

Both of these islands are in the track of migrants coming up the channel, and observations taken from them will prove very interesting.

Mr. Barrington, in his great work on the 'Migration of Birds,' records a good many reports from the lightkeepers at Rockabill. The most noteworthy of these seem to be the following, which do not occur on the mainland here:—Common Redstart, Whinchat, Snow-Bunting, Water-Rail, Grey Phalarope, Jack-Snipe.

As I have only been resident here for two years, I have, however, much to learn as regards migration and the occurrence of rare birds in this neighbourhood. The following are those which have occurred in my experience in 1903-04:—

1903.

Feb. 7th.—A Black Redstart (female) in the harbour, perching on the timber cut down for exportation. This bird remained for about three weeks, in company with Sparrows, &c.

May 2nd.—Heard a Grasshopper-Warbler at 7.30 p.m. near Fancourt. Never heard or saw one since.

Sept. 4th.—A White Wagtail at the Delvin River. *24th.* A Hoopoe, *Upupa epops* (male), shot at Lowtherstone by Mr. G. W. Norman. This bird was preserved by Mr. A. Rohu, naturalist.

1904.

April 12th.—Saw a pair of Ray's Wagtails land on the rocks off Fancourt. These birds were not seen here after that day, but on Oct. 31st, Rev. P. C. Hayes, Rector of Raheny, about eighteen miles distant, sent me an immature Ray's Wagtail which he found dead in the bath-room at the rectory.

Nov. 11th.—Black Redstart (male), in good plumage, was seen

by me on the rocks at Fancourt. It must have been passing south, and was not seen again.

I have thought it well only to transcribe my own notes in the following list, as the enumeration of all the very common birds is often uninteresting. I adopt the order of birds in Mr. A. G. More's list of Irish Birds.

LONG-EARED OWL (*Asio otus*).—In Hampton demesne.

BARN-OWL (*Aluco flammeus*).—Often heard at night with its peculiar "kek, kek, kek."

SPOTTED FLYCATCHER (*Muscicapa grisola*).—Fairly common.

REDWING (*Turdus iliacus*).—Not common.

FIELDFARE (*T. pilaris*).—Seen and heard flying overhead. I have not seen any in the fields.

STONECHAT (*Pratincola rubicola*).—Common. I have not met with the Whinchat.

ROCK-PIPIT (*Anthus obscurus*).—Common on the shore.

CORN-BUNTING (*Emberiza miliaria*).—Not common. Heard singing in December.

TREE-SPARROW (*Passer montanus*).—Often observed on the road to Fancourt. Saw a group of five in the autumn. I never observed this bird anywhere else in Ireland except at Howth Junction, where it was pointed out to me by Mr. E. Williams, naturalist.

PARTRIDGE (*Perdix cinerea*).—I have only observed this bird at Fancourt here once.

TURNSTONE (*Streptilas interpres*).—Fairly common.

COMMON SNIPE (*Gallinago cœlestis*).—The "drumming" of this bird at the "Bog of the Ring" is very remarkable in the breeding season.

DUNLIN (*Tringa alpina*).—Fairly common, but not as numerous as the Ringed Plover.

SANDERLING (*Calidris arenaria*).—Not common.

COMMON SANDPIPER (*Totanus hypoleucus*).—Breeds near the shore, in little gorges; waterworn.

COMMON REDSHANK (*T. calidris*).—Found almost everywhere about Balbriggan; one of the most common birds.

WHIMBREL (*Numenius phæopus*).—"May-Bird." Not common; "a passing visitor."

COMMON TERN (*Sterna fluviatilis*).—Constantly seen off shore, but does not breed on mainland.

LESSER TERN (*S. minuta*).—I saw numbers of these birds in 1903, but, strange to say, none in 1904.

BLACK-HEADED GULL (*Larus ridibundus*).—Fairly common. Our harbour-master persists in saying that there are two species.

COMMON GULL (*L. canus*).—Plentiful in winter.

HERRING-GULL (*L. argentatus*).—Common at all seasons.

LESSER BLACK-BACKED GULL (*L. fuscus*).—Not very common.

GREAT BLACK-BACKED GULL (*L. marinus*).—A few pairs only.

KITTIWAKE (*Rissa tridactyla*).—Fairly common all the year round. Called by the coastguards "the Pigeon Gull."

RAZORBILL (*Alca torda*).—Fairly common.

GUILLEMOT (*Uria troile*).—A few only.

GREAT NORTHERN DIVER (*Colymbus glacialis*).—Fairly common in winter. On Nov. 16th, at Cromwell's Harbour, about a mile from this town, I witnessed a most interesting sight—five Great Northern Divers swimming backwards and forwards in the harbour. I watched them carefully for nearly an hour, concealing myself behind a rock; they were not more than fifty yards away. One was leader, and the others followed two by two. Every now and then the leader screamed, diving immediately afterwards, and the four others diving also at the signal. They were all in winter plumage.

RED-THROATED DIVER (*C. septentrionalis*).—Fairly common in winter.

LITTLE GREBE (*Podiceps fluviatilis*).—Common at the "Bog of the Ring," about three miles inland.

CORMORANT (*Phalacrocorax carbo*).—Very numerous. I have not observed the Shag.

GANNET (*Sula bassana*).—Frequently cruising off the harbour in summer.

COMMON HERON (*Ardea cinerea*).—Breeds in Hampton demesne. I once counted sixteen Herons standing close together at the Estuary, Malahide.

WHITE-FRONTED GOOSE (*Anser albifrons*).—I have twice noticed small flocks passing south.

WILD DUCK (*Anas boscas*).—Plentiful at the bog and on the sea.

WIGEON (*Mareca penelope*).— Not common, as there is poor feeding ground here.

TUFTED DUCK (*Fuligula cristata*).— Fairly common in winter.

GOLDEN-EYE (*Clangula glaucion*).— Fairly common at the "Long Leg."

COMMON SCOTER (*Edemia nigra*).— Little parties may be seen every day swimming at some distance from the shore ; once only did I see one on the rocks.

I am by no means satisfied with this list. I hoped to have added before this a good many other birds, some of which have been reported to me, but I have only set down those which I have myself identified.

Oct. 10th, 1904.—I witnessed a most remarkable fight between a female Sparrow-Hawk and a Kestrel. I saw them engage in mortal combat about fifty feet over the shore, and then they fell together, the Kestrel screaming loudly. I hurried to the spot, and got quite close before the Sparrow-Hawk let go her hold and rose into the air, and the Kestrel, which seemed in great terror, got away. I feel sure that but for my arrival it would have been killed.

NOTES AND QUERIES.

AVES.

Early Nesting of Dipper (*Cinclus aquaticus*).—A nest of this species was found by W. Brown, from which four young ones were hatched on March 13th. It was built on a broken brick wall of a mill-slucice, connected with a large cotton mill, within the city.—T. L. JOHNSTON (Carlisle).

Nesting Habits of the Wren (*Troglodytes parvulus*).—I have been much interested in the notes that have appeared in the last two numbers of 'The Zoologist' on this subject. From observations extending over a number of years, I am inclined to think that the primary object of the unlined nests is to protect the birds—both young and old—the young just after they have left the lined nest where they were born, and the old birds in severe weather. Being one of our smallest resident birds, they are easily affected by stormy weather. Often after a sudden night's frost I have found their dead bodies where they have been caught away from their sheltered spots. On one occasion, in a sheltered ravine on an island in the West of Scotland, I found an unlined nest containing the bodies of six mature Wrens; the sixth had its tail and part of its body protruding from the hole in the nest. All the birds had been frozen to death. Wherever we find the habitat of the Wren, we also find one or more of these unlined nests, which are built at various times of the year. I have found them in process of building during the autumn, and they are generally built before the lined nest is begun; in fact, the lined nest is placed in the vicinity of the unlined nest, not the reverse. I have seen them built in all manner of places—in hollow trees, in thatched roofs, in holes in walls, amongst ivy, in beech-hedges, under branches of thick fir-trees, in juniper-scrub, in thick clumps of bracken, between the wings of a dead Crow hanging in a keeper's "larder," in haystacks, and in the out-buildings of farmsteads, &c. Wherever the situation, it has always been a sheltered one, and as a rule the building material has had a wonderful semblance to the surroundings. It has occurred to me of late years that the Wren is not so numerous in the north as it used to be.—J. S. T. WALTON (Sunniside, Stocksfield-on-Tyne).

Abnormal Nests of the Swallow (*Hirundo rustica*). — My first thought on reading the communication on this subject by Mr. S. G. Cummings (*ante*, p. 121) was “abnormal” or “natural?” True, it is not the common form of nest met with “up along,” as we should say “down west,” though it is so occasionally. Cf. ‘British Birds’ Nests,’ p. 276, where Mr. Kearton says:—“We discovered several nests in a Surrey bothy last summer that were built against the white-washed wall, and were exactly like those of the Martin, except that the tops were open.” In this part of Cornwall, so far as my experience goes, the type of nest described in the article is by far the commonest both in barns, outhouses, and caves, and I fancy this to be a natural form of nest, from which the commoner form in this country has been developed by change of circumstances. Seebohm’s remarks (‘British Birds,’ vol. ii. p. 174), cited but not quoted in the article, exactly describe the type of nest found in this district. After describing the usual nest of the Swallow in this country, he says:—“By far the greater number of Swallows’ nests which I have seen in this country have been built in this position and on this model. Curiously enough, this is not the case on the Continent. There the Swallow generally builds against a perpendicular wall, but also only a few inches below some horizontal shelf or roof; in this situation the nest is in the shape of a quarter of a hollow globe of mud. To increase the security of the structure it gladly avails itself of any little projection or nail or peg to begin on. But the usual nest of the Swallow on the Continent only differs from that of the Martin in having the sides as well as the front open instead of built up to the projecting shelf or roof.” It is to be noted that the writer, in citing this passage, says: “According to Seebohm this form of construction is not uncommon on the Continent,” whereas Seebohm actually says, “generally builds against,” and the “usual nest of the Swallow.” I would add that, while Kearton says “exactly like those of the Martin,” and Seebohm “only differs from that of the Martin,” my own experience says, alike in shape, but generally far more untidy from the long straws interwoven with the mud. In an outhouse on a rough whitewashed wall, or in a cave, the general roughness of the site appears sufficient support for commencing operations; on the perpendicular side of a beam any irregularity may be taken advantage of. On the west coast of Scotland, last June (where I find the same continental type of nest), three nests were in building on the perpendicular sides of beams in a cart-house—one, practically finished, begun on a staple, and two on nails, one of which only projected a little over an inch from the beam; and in a boat-house in the same district was a nest in a similar position,

containing a full clutch of eggs, which had been begun on a short length of quarter-inch iron bar, casually pushed under the wall-plate, so that the free end just touched one of the beams, at an angle of about forty degrees. This bar could be removed and replaced without in any way interfering with the stability of the nest. In Cornwall, owing to the abundance of natural situations, many of our birds are not so advanced in their dealings with mankind as in other parts of England, and I should say in this district the greater number of Swallows still keep to the caves around the coasts for their breeding stations. I know several caves, whether sea-caves into which the tide flows, or mine adits emptying out on the cliffs, where many pairs breed every year, and the nests are mostly of the continental type, though varying in shape according to the situation. I have not yet found the flat saucer-shaped nest, typical in the up-country barn. House-Martins' (*Chelidon urbica*) nests cover the face of the sea-cliffs in places, e.g. at Cadgwith, and even the ever-present *Passer domesticus* will sometimes prefer holes in a cliff near a village to the actual dwellings of man.—H. HOLROYD MILLS.

Abnormal Nests of the Swallow.—With regard to Mr. S. G. Cummings's article (*ante*, p. 121), a pair of Swallows (*Hirundo rustica*) built a nest in a sort of outhouse here two or three years ago, which was without any support beneath it. The nest has now fallen down, but a brood was hatched, and the mark of it can still be seen. It was placed against a very smooth brick wall just under the whitewashed ceiling, and was very like a House-Martin's (*Chelidon urbica*), except that it had more roots and straws with the mud. Several years before a similar unsupported nest was built by Swallows, which was fixed against the beams in a shed in a paddock here, and which exactly resembled the nest in fig. 2. I am inclined to think that these nests, without a ledge to rest on, are a good deal commoner than is supposed.—HAROLD RUSSELL (The Ridgeway, Shere, Surrey).

Nesting Habits of the Swallow.—In the fen-country between Peterborough and Wisbech nests of the common Swallow are not infrequently built under the bridges which carry roads across the drains, or "dikes," as they are called locally. These nests are built against the smooth brickwork of the bridge, and are necessarily without support of any kind from below. Two occupied nests which I saw under one bridge in Whaplode Drove, in June, 1885, were only a few inches above the water-line; the span of the arch at water-level was three feet, and the keystone barely two feet from the water. In 1898 I noticed two Swallows' nests on the rocks in the large artificial cave

which constitutes the entrance to the disused copper-mines at Alderley Edge, Cheshire, but in the dim light could not see whether they were of the usual type and built upon ledges, or whether the lower rim was unsupported by projection or inequality of surface, as is the case in the nests beneath the low brick bridges in the fens.—CHARLES OLDHAM (Knutsford).

Movement of Young Nightjars (*Caprimulgus europæus*).—Not by any means the least fascinating and useful part of wild-bird photography is that most exceptional opportunities are given for learning the habits of birds. Mr. J. H. Gurney (*ante*, p. 88) is puzzled to account for the fact that young Nightjars are frequently found a yard or more from the spot where they were hatched, even so soon as the day after hatching, and suggests that they are probably carried in the mouth of the old bird. I can assure him that even when but a day old these quaint little creatures are quite capable of traversing unaided the distance mentioned. I have several times during the last four years spent pleasant hours concealed, with my camera, beneath a bower of branches, and within six feet of the home of these interesting birds, almost always after the young were hatched, and at least on two occasions when they were not more than a day old. A description of what took place on one of the latter occasions may be taken as typical of all, irrespective of the age of the young birds. Before creeping into the bower, which had been previously prepared, I made some photographs of the young birds, which appeared incapable of walking or even standing upright. After I was carefully concealed, with my camera, beneath the branches, so that no part of the apparatus except the lens or of my clothing was visible from outside, I had to wait about twenty minutes before the old bird returned. She flew straight down to the ground, alighting about a yard from the young ones, and, catching sight of the lens, hesitated. After a minute or two she gave utterance to a peculiar crooning sound, something like the croaking of a Frog, but softer, and more like a hoarse whisper. Immediately the two little birds, which had appeared quite inanimate, became very much alive, and—to use an expression which most nearly describes their method of progression—toddled at a great rate to their mother, who took them partly under her forward breast-feathers. This was interesting to watch, but not conducive to my obtaining photographs of the old bird, as it was necessary to turn the camera round a point and refocus, not an easy matter under the circumstances without alarming the old Nightjar. I did, however, succeed in making some good studies of this bird; but, in photographing Nightjars, I have

always been troubled with this habit they have of calling the young to a fresh spot.—WM. FARREN (Regent Street, Cambridge).

The Sounds produced by the Long-eared Owl (*Asio otus*).—Mr. Howard Saunders, in his 'Manual,' says, with reference to this bird: "The young utter a loud mewing, and the old birds occasionally make a barking or 'quacking' noise, both while on the wing and also when perched; but as a rule this species is rather silent, and certainly does not 'hoot' like the Tawny Owl." Other works on ornithology that I am able to consult say little or nothing on the subject, though Mr. W. Swainsland, in 'Familiar Wild Birds,' comes nearest, I think, in his word-spelling of the note, which he says "may be said to resemble the syllable 'hoo-ok.'" As I have often listened to the strange sounds produced by this bird, I will now attempt briefly to describe them.

Sound No. 1 I have heard at 5 p.m. on Jan. 9th, and 7 p.m. on March 29th; on the latter date and hour when Thrushes and Black-birds were in full song. By quietly listening just outside a fir-plantation I heard the first sounds of the awakening Owls—"oo-woo, oo-woo"—a low faint coo rather than a hoot. Sometimes, when one is within a very few yards, it sounds like "roo-oo" or "whr-oo." It is no louder and somewhat suggestive of the coo of the domestic Pigeon, and, I should think, could not be heard at a greater distance than fifty yards, even when heard under the most favourable circumstances. It is thus infinitely less loud than the hoot of the Tawny Owl (*Syrnium aluco*), which I think might be heard a mile away. But the former species calls much more frequently—indeed, one might say continuously—for a considerable time after it has uttered the first sound.

Sound No. 2.—This is about as musical as the noise made by a scratchy slate-pencil drawn vertically across a slate; "kyiark" is the best word-representation I can make of it. A bad violin might produce it, and it might be described as harshly cat-like. The young birds (nestlings) make this same sound even more shrilly, but I think not so loud. I have heard it in January, when, of course, there are no young birds.

Sound No. 3, which I regard as the most remarkable, I feel quite certain is produced by the bird's wings being brought into contact *under the body* whilst the bird is in flight, and that it is *only produced in this way*. I have heard the sound on several occasions when there has been quite sufficient light to enable me to note every stroke of the bird's wings as it sailed about over and close to the tops of the low spruce-firs, which here are its favourite haunts. The noise thus produced sounds like "bock," and is heard every time the bird's widely

swept wings seem to come in contact beneath the body. I have not timed the wing-beats by a watch, but the intervals seem to be about one second. Whilst these sounds are being produced the flying bird is always over the tops of the trees in which other birds continue to make the faint hoot, or No. 1 sound, and it is thus possible that the wing-clappings are in answer to the hoots. Perhaps the females are the hooters, and the males the clappers. The clapping is the loudest sound made, and might be heard at double the distance that one could hear either of the other sounds. I have not heard the slightest sound uttered whilst these birds fly away if disturbed in the woods, or when they fly over the fields prey-hunting, when probably, and of necessity, they are always silent.—W. GYNGELL (Scarborough).

Peregrine Falcon in Warwickshire and Oxon.—A friend in South Warwickshire, just over our borders, sent me a young male Peregrine Falcon (*Falco peregrinus*), which had been shot on Dec. 3rd, 1904, while sitting on an elm-tree in a wood, by the keeper, who said the local Hawks had mobbed it. It is a good example of what falconers called a Red Tiercel, and is a true Passage Hawk, being supposed to have arrived with a number of "foreign" Wood-Pigeons which came into the district about that time. Whatever it had been feeding upon, it was in very high condition, for it weighed $1\frac{3}{4}$ lb., but the only portion of the food inside it, Mr. Schumach thought could be recognized, and sent to me, was the foot and tarsus of a Thrush. The Tiercel measured 16.6 in. in total length; wing, 12.7 in.; cere and eyelids bluish grey, dashed with yellow; bill pale bluish horn, tip horn; legs and feet very pale dull yellow. The Peregrine Falcon is a regular visitor to the southern midlands on the autumn migration, living, I believe, largely on Wood-Pigeons, though Partridges are also taken, and, I think, Mistle-Thrushes, and perhaps some other birds. I once saw what I believe was a Peregrine Falcon attacking a bunch of travelling Starlings very high in the air. The Falcons which haunt the reservoirs prey upon the wildfowl. On Nov. 4th, 1898, I saw a beautiful blue Peregrine (a female from the size) fly low over Byfield Reservoir, causing a lot of Coots sitting on the edge to scuttle into the water in a great state of alarm. I heard one year of two Peregrines shot at different dates in November at Boarstall Decoy, where they would be very unwelcome visitors, and might render the fowl shy of the pond if they remained there long. During the severe weather at the end of November last year we were, one very cold day with snow on the ground, trying to get a couple of coveys driven over us from a big high-lying stubble; but a "big Hawk" upset the drive, causing

the birds to lie until almost trodden on, and then fly in all directions but the right one, "putting in" to the hedges as soon as might be. They were much more afraid of the Hawk (in front) than of the beaters. Posted where I was, I did not see the Hawk, but, from the description given by one of the guns, it was no doubt a Peregrine, and a "Falcon," although one beater, who was close to it, declared that it was "as big as a Goose." The birds which visit us in autumn are usually birds of the year (as stated in the excellent article on this bird in the fourth edition of 'Yarrell'), real "Passage" or "Peregrine" Hawks; but in winter, and on into March, I have known blue "Haggards" shot on several occasions.—O. V. APLIN (Oxon).

Pacific Eider in Orkney.—As the bird is not in existence, or at any rate cannot be produced, Mr. Robinson is hardly justified in stating (*ante*, p. 143) that the Eider which was shot some years ago by S. Sutherland establishes the occurrence of the Pacific Eider in British waters. Some of the species of *Somateria* resemble one another very closely, and nothing less than a detailed description of the specific characters can be deemed satisfactory evidence of the occurrence of one of these critical species. Sutherland's recollection of the bird is obviously vague, for in a letter referring to the Graemsay example he says:—"It had a very fine shaped V under the throat, a mark very seldom seen. I have seen it before, but very rare." Even if it be granted that he shot an Eider with a black chevron on the chin, the possibility remains that it was a King-Eider (*S. spectabilis*), a species of which at least four examples have been recorded from Orkney, or a Dresser's Eider (*S. dresseri*), a species which sometimes has a dusky chevron on the chin, and in other respects very closely resembles *S. v-nigrum*. Dresser's Eider is, judging from its geographical range, more likely to occur in British waters than is the Pacific species; it has, as a matter of fact, been obtained in Holland (*cf.* Saunders, 'Manual of British Birds,' 2nd edit. p. 460). Whatever the bird may have been which Mr. Robinson and his boatmen saw near Stromness in February last, it certainly was not a female Pacific Eider, for he describes it as smaller than a Common Eider, with a head which appeared to be almost white. The average measurements of *S. v-nigrum* exceed those of *S. mollissima*, but the females of the two species and of *S. dresseri* are practically alike in coloration, and can only be distinguished with certainty by the differences in the shape of the bare spaces at the base, and the feathered wedge in the centre of the upper mandible.—CHARLES OLDHAM (Knutsford).

Red Grouse in Anglesea.—On March 21st I picked up some freshly

plucked feathers of a Red Grouse (*Lagopus scoticus*) on a cliff-top at Carmel Head, North Anglesea, the work, presumably, of one of the local Peregrine Falcons. So far as I can ascertain, this seems to be the only evidence that the bird has occurred on the island. The nearest Grouse-moors (in Carnarvonshire) are some five and twenty miles away—a long distance for this species to stray at this season, and in fair weather; an instance perhaps of the survival of a migratory instinct now practically extinct.—S. G. CUMMINGS (Chester).

Do Partridges Migrate?—I asked this question in my 'Notes of an East Coast Naturalist,' pp. 54-58, and tried to answer it in the negative, somewhat against my convictions. As a matter of fact, almost yearly the French species (*Caccabis rufa*) "puts in an appearance"—I put it that way—in lesser or greater numbers in the spring. Chance time none are actually seen; in other years, sometimes for two or three seasons in succession, small flights are unexpectedly met with on the sand-hills near to the sea; I say unexpectedly, but when I was a lad we boys used actually to frequent the denes (sand-dunes) in April, searching in the furze and marram-tufts for them. I know it is stated that Lord Rendlesham and the Marquis of Hertford "introduced" the species into East Anglia in 1770, and another lot were turned adrift in 1823; but why do we not meet with the bird in other months than April or May? Its appearance, too, almost invariably coincides with stiff and persistent easterly winds. The birds also are usually so wearied and exhausted that it is not a difficult matter to run them down, and, as I have assisted doing so, I am not depending upon hearsay. Stevenson ('Birds of Norfolk') remarks on "a wandering instinct" in the French Partridge, and suggests that it attempts to leave our shores, but, misjudging distance and its powers of flight, attempts a return, and would thus naturally be regarded as a foreigner just arrived upon the coast. On the 19th ult. between thirty and forty were discovered on the sand-hills south of the town. The wind had been easterly and of some strength for some time. Now, I hold this, that the Quail, which is an acknowledged immigrant, has proportionately no greater power of wing than the Partridge, or the Gallinules, or the Rails—birds that often exhibit equal wing-weariness when met with directly after their arrival. Surely a journey across Channel, or even this part of the German Ocean, is not beyond its powers of endurance. I do not like to be dogmatic, but, with all due respect to Stevenson, and some of my good Norfolk friends, whose knowledge of bird-life, I freely admit, is greater than my own, I still incline greatly to the possibility and probability of its being migratory,

at least in spring. Whether any leave us in autumn is another question; the bird would then have lost its nesting instinct, and would probably be fat and well-favoured, and scarcely in a condition to depart. Whether any French Partridges were ever observed on our sand-hills before 1770, it is of course impossible for one to say, as we have no contemporary records to be guided by. I should like to have the opinion of other correspondents living on the east and south-east coasts of England as to whether similar or any satisfactory conclusions have been arrived at on this subject.—A. PATTERSON (Ibis House, Great Yarmouth).

Notes on the Ornithology of Richmond Park, Surrey.—Referring to my notes on this subject (*ante*, p. 147), I wish to point out an error, and also give some additional records, which will raise the number of birds to seventy-six. On p. 149 I find that I should have written Lesser Redpoll (*Linota rufescens*) in place of Linnet (*L. cannabina*). The additional records are:—

KINGFISHER (*Alcedo ispida*).—Sometimes to be seen on Beverley Brook, generally the part which runs through the paddocks between the Roehampton and the Robin Hood's gates. One of the keepers informed me that it is occasionally seen on the Penn Ponds in very hard weather.

HOODED CROW (*Corvus cornix*).—Very rare. Saw one between the Sidmouth Plantation and the Ponds on March 12th.

STONECHAT (*Pratincola rubicola*).—This species is more numerous of late.

WHITE WAGTAIL (*Motacilla alba*).—Occasionally met with. A friend of mine saw one on April 17th not far from Richmond Gate.

GREY WAGTAIL (*M. melanope*).—Rather a rare winter visitor, though a pair generally put in an appearance each year.

GOLDFINCH (*Carduelis elegans*).—Although rather rare, this beautiful bird is on the increase, and I have seen several this year. I may mention that I counted fifteen in a flock at Ripley on March 19th, and have noted them in one or two other localities, principally at Oxshott. This evident increase is due no doubt to the beneficial Wild Birds Protection Acts.

LINNET (*Linota cannabina*).—Generally to be seen in the autumn and winter months, but it does not, as far as I can ascertain, breed within the precincts of the Park.

REED-BUNTING (*Emberiza schoeniclus*).—Very rare. Have only seen this species once—on April 16th.

SHOVELER (*Spatula clypeata*).—There are a pair on the Ponds which

were obtained from St. James's Park, London. I mention this as a safeguard against their being mistaken for wild birds.

TUFTED DUCK (*Fuligula cristata*).—Saw three fine males and two females on March 12th. This bird, in common with other species of the *Anatida*, evidently calls in now and again whilst on migration.

POCHARD (*F. ferina*).—A party of sixteen on the 18th, six (four males and two females) on the 25th and 26th of March, and three (one male and two females) on April 9th. Since the 16th a pair have been there, and I trust will stay to breed.

SCAUP (*F. marila*).—I have never noticed this species personally, but Mr. Dalgliesh saw a number on March 27th, 1904 (*vide Zool.* 1904, p. 193).

BLACK-HEADED GULL (*Larus ridibundus*).—Generally to be seen at the Ponds during the winter.

GREAT CRESTED GREBE (*Podiceps cristatus*).—I first noticed the Grebes this year on Feb. 26th (they arrived at least one day before this—*cf.* Dalgliesh, *ante*, p. 109); one was an adult male, and the other a female in winter dress. On March 4th they had disappeared (it was very cold just before this date); perhaps this accounts for their disappearance. However, on the 12th there were two adults, which have remained, and are now breeding. They have built their nest moored to the overhanging branches of a willow which grows on the island. I first noticed the female bird sitting on April 9th, and the male bird continually adds to the size of the nest. About March 25th a report appeared in one of the local papers that there were three Grebes on the Ponds, but after a prolonged search I failed to discover the third. However, on April 15th a friend saw three, and she concludes that the third is one of last year's young. I should like to ascertain if any reader of 'The Zoologist' can confirm the report made in March that there were three Grebes on the Ponds.—L. B. MOURITZ (6, Esmond Road, Bedford Park, W.).

Notes from Shetland (from June, 1904, to April, 1905).—

AVES.

STOCK-DOVE (*Columba oenas*).—One at Halligarth on June 22nd, 23rd, 24th, and 25th. I saw the bird several times each day. One has to be very careful about the identity of birds described as "Stock-pigeon" or "Stock-doo" by Shetlanders; the word "stock" is commonly used by natives to describe large or common species.

LINNET (*Linota cannabina*).—One at Halligarth, Aug. 7th. This bird is very rare in Shetland. It was first identified by Mr. Harvie-

Brown a few years ago. The name "Linnet" is invariably bestowed on the Twite by Shetlanders.

GREAT NORTHERN DIVER (*Colymbus glacialis*).—This species has been very plentiful round the coast during autumn and winter. A few are still to be seen (April 30th, 1905). It has, I regret to say, fallen to my unhappy lot to have had many opportunities of examining recently killed specimens. In my experience the bill, usually described as "horn-colour," has not been so. I have always found it more or less bluish white, except towards the end of the upper mandible, which is horn-colour. The bluish white rapidly changes (within a few hours) to reddish purple, and then, after a day or two, to dull horn-colour. The inside of the tarsi and toes, and also the middle portion of the webs, are also bluish white, very similar to those of the Long-tailed Duck; this white soon changes to brownish black. With regard to this bird sitting upright on land, and also as to its mode of progression on land, it certainly does assume an erect attitude, occasionally at least. On Oct. 14th I surprised one sitting a few yards from the sea on some smooth ground; it rose on "tip-toe," and with head erect, bill in the air, and moving feet and outstretched wings, very rapidly reached the sea long before I even arrived at the spot *where it had been*. It reminded me somewhat of an excited old gander as it moved over the ground.

WHOOPEE-SWAN (*Cygnus musicus*).—Heard passing overhead on Nov. 8th, at 8 a.m. Seen going north, March 10th. One seen April 4th.

WOODCOCK (*Scolopax rusticula*).—A few seen during December.

SNOWY OWL (*Nyctea scandiaca*).—One seen on Oct. 29th, and one April 4th.

PEREGRINE FALCON (*Falco peregrinus*).—A wounded one, with wing broken, brought to me alive on Nov. 21st. I had to chloroform it to disengage its claws from the basket in which it came, and also for my own protection while I repaired the wing. It is still alive and very tame, eats mice, birds, scraps of meat, and fresh fish.

CARRION-CROW (*Corvus corone*).—Saw five, along with two Hooded Crows, close to the roadside near Haroldswick at 2 p.m. on Feb. 25th. These are the first I have seen in Shetland. N.B.—It may be suggested that these were young Rooks, but this was not so. I was within a few yards of them, and was able to see them perfectly, and to describe to my little daughter the chief differences between the appearance of Rooks and Carrion-Crows.

ROOK (*C. frugilegus*).—Arrived March 4th. A few still about.

JACKDAW (*C. monedula*).—One seen at 11 a.m. on Feb. 3rd ; another (perhaps same one) on April 1st, at same place.

RAVEN (*C. corax*).—Young birds flying, April 22nd.

BLACKBIRD (*Turdus merula*).—Building at Halligarth, April 16th.

GREAT SKUA (*Megalestris catarrhactes*).—Arrived April 11th.

RICHARDSON'S SKUA (*Stercorarius crepidatus*).—Arrived April 13th.

PUFFIN (*Fratercula arctica*).—Arrived April 18th.

MOORHEN (*Gallinula chloropus*).—One, April 28th.

I would take this opportunity of warning egg-robbers that in Shetland more elaborate precautions are being taken to limit their depredations than ever before, and that, while true naturalists will always be welcomed and helped as heretofore, mere collectors and dealers will be at least "discouraged" in their nefarious trade.

PISCES.

It is somewhat difficult to get any information about the fishes frequenting the coast, the local boats having almost entirely given up line-fishing, or, indeed, any fishing but for Herrings in summer. The trawlers have during the last two months reported to me the following :—

Halibut, Ling, Sole (Lemon), Whiting, Flounder, and Haddock, plentiful. Cod, rather scarce ; Skate, plentiful ; Red and Grey Gurnard, very plentiful a few miles north-east from here ; Bergylt, a few ; Bream (Sea), one brought to me April 10th.—T. EDMONDSTON SAXBY (Baltasound).

Early Migrants near Chester. — The arrival of the Whinchat (*Pratincola rubetra*) on April 14th, and the Land-Rail (*Crex pratensis*) on April 15th, are, I think, worth recording for this district, both species being about a fortnight before their usual time. On April 28th I also saw, at close quarters, a Turtle-Dove (*Turtur communis*) in a tree by the city walls. As a rule, this migrant arrives here with unfailing regularity at the beginning of the second week in May. I may mention here that this species will occasionally soar with motionless wings, like a Ring-Dove, returning to the same perching-place from whence it started—a habit which seems to be little known, or at any rate seldom noted.—S. G. CUMMINGS (Chester).

THE ZOOLOGICAL SOCIETY'S GARDENS.

THE most interesting addition to the Society's Gardens during the month of April was a young female Giraffe, purchased from Captain Phillips, who brought her from a spot midway between Zinder and Gummel, near Lake Chad, in Northern Nigeria. She stands about eight feet high at the head, and is believed to be about fourteen months old. On the evidence of its locality this Giraffe has been provisionally referred to the race named *Giraffa camelopardalis peralta* by Thomas, who based it upon the skull and limb bones, which indicated an animal of exceptional height. Now, one of the most interesting points about our new Giraffe is its striking similarity to the Nubian or Eastern Soudanese form, the typical Giraffe described by Linné; and, since we know that certain animals, like the Sabre-horned Oryx, range from Senegambia to the Eastern Soudan, it would not be surprising if the same were found to be true of the Giraffe. Moreover, since the specimen named *peralta* came from a spot near the junction of the Binué and Niger Rivers, a totally different "station" from the neighbourhood of Lake Chad, it is highly probably that our new Giraffe is not "*peralta*" at all, but a representative of the typical race. The rarity of Giraffes in Nigeria is attested by the fact that in the beginning of 1904 the only positive evidence of the existence of these animals in that region of Africa was supplied by the bones above alluded to as described by Mr. Thomas. There are now examples of three distinct races of this most attractive ruminant in the Gardens, namely, *Giraffa camelopardalis ? peralta*; *G. c. antiquorum*, from Kordofan; and *G. c. wardi*, from the Sabi River, South Africa.

Mention may also be made of a pair of four-horned Antelopes, received in exchange, and of a Huanaco from Punta Areñas, presented by Mr. Moritz Braun and Capt. Crawshay. Four-horned Antelopes do not always deserve their name, the anterior pair of horns being frequently absent, as was the case with the example, deposited by His Majesty, which died in the Gardens last year. In the buck of the pair recently received, however, the anterior horns are well developed. The Huanaco is a welcome addition. The Society now possesses a specimen of each of the two known wild species of Llama, namely, the Vicuña and the Huanaco, and also examples of one of the domestic races, the true Llama. The accession of an Alpaca would complete the series. Several Monkeys have also been received, the most attractive amongst them being a mother and baby Anubis Baboon.

The only birds to which attention need be particularly drawn are a pair of Indian Concave-crowned Hornbills. As was pointed out to me by Mr. Bertling, the head-keeper, the cock and hen differ from each other in one curious particular, namely, the colour of the iris of the eye, which in the hen is greyish yellow, and in the cock deep red.

R. I. P.

OBITUARY.

ALPHEUS SPRING PACKARD.

WE greatly regret to record the death of this accomplished naturalist, and we reproduce an excellent biographical notice from 'The American Journal of Science' for March:—

"Alpheus Spring Packard, Professor of Zoology and Geology in Brown University, died at his home in Providence, R. I., Feb. 14th, 1905, at the age of nearly sixty-six years.

"Prof. Packard was a son of the late Prof. Alpheus Spring Packard, of Bowdoin College, and was born at Brunswick, Me., Feb. 19th, 1839. He was graduated from Bowdoin in 1861, and from the Maine Medical School and the Lawrence Scientific School in 1864. At Cambridge he was one of that remarkable group of students—Hyatt, Morse, Packard, Putnam, Scudder, Shaler, and Verrill—associated with the elder Agassiz in the early sixties. He served for a time, in 1864–5, as Assistant-Surgeon in the U. S. Army, but never became a regular practitioner of medicine, his life being devoted to his chosen work in zoology and geology. An enthusiastic field naturalist, collector, and explorer, as well as a very voluminous author who wrote on a remarkably wide range of subjects, he was specially distinguished as an entomologist. He is most widely known, and will probably be longest remembered, for his original work on insects, and his several textbooks on entomology and zoology. Early in his career he accepted the theory of evolution, and later became an ardent neo-Lamarckian. One of his last works was 'Lamarck, the Founder of Evolution; his Life and Work.' He was one of the founders of the 'American Naturalist,' for twenty years its chief editor, and a constant contributor to its pages. Prof. Packard was a member of the National Academy of Sciences, and of many European societies. Before his appointment at Brown, in 1878, he was successively Librarian and Custodian of the Boston Society of Natural History, Director of the Peabody Academy of Science, State Entomologist of Mass., and a member of the U. S. Entomological Commission.—S. I. S."

NOTICES OF NEW BOOKS.

A Student's Text-Book of Zoology. By ADAM SEDGWICK, M.A.,
F.R.S. Vol. II. Swan Sonnenschein & Co., Ltd.

THE first volume of this work was noticed in 'The Zoologist' for 1898. The second has just been published, and a third volume—dealing with the Tunicata, Enteropneusta, Echinodermata, and Arthropoda—is in the press; the present volume being devoted to the Chordata—Pisces, Amphibia, Reptilia, Aves, and Mammalia.

It would be beyond our scope to give a *résumé* of the classification adopted in this cautious and excellent text-book, or to deal with the anatomical and morphological details which form its substance; these are for its reader—the biological student, an individual who is now provided with material that would have gladdened the heart and differently influenced the career of many young zoologists in the past generation, when an evolutionary attitude was not considered to be always safe in biological treatises. Now it is no longer a question as to whether a writer in this field is an evolutionist, but rather in what biological grade he works, or to what evolutionary plane he has attained. Mr. Sedgwick, in his preface, asks for lenient judgment if in some pages he has "seemed to take up an unduly critical position with regard to views widely prevalent at the present time on some aspects of organic evolution," a position in which many others find themselves, who, holding the evolutionary faith or conception, do not feel compelled to accept every proposed interpretation, nor do they hold that such non-acceptance is biological heresy. We often seem to have reached the stage of enjoying a new theory as much as the enunciation of an hitherto unknown fact, and though theologians sometimes tell us we are reincarnate decadent Romans,

they might with equal plausibility describe some naturalists as having once belonged to that community of leisured Athenians, who, we read, devoted their time "either to tell, or to hear some new thing"; it is the evolutionist who is most scandalised by some of the current pseudo-evolutionary guesses.

In the Mammalia, though Mr. Sedgwick does not devote too many pages to his order "Primates," he deals with it in a most suggestive and interesting spirit. He recognizes four families—*Hapalidæ*, *Cebidæ*, *Cercopithecidæ*, and *Anthropomorphidæ* (*Simiidæ*), in which he places *Homo*; and he divides the human race into three primary groups—Negroid, Mongolian, Caucasian. Whether this is a permanent anthropological classification or not, but few will disagree with the remark, and one which constructors of genealogical trees may be asked to notice, that "it is a striking commentary on the attempts of modern naturalists to discover the pedigrees of different species of animals that, with our relatively full knowledge of man, historical, anatomical, and ethnological, we are unable to agree upon a zoological classification of him which shall show the consanguinity of the different races." Our author concludes the subject, and also this excellent volume, by two eulogistic notices of our genus by Shakespeare and one of the Hebrew Psalmists; but is it not probable that even intellectually we take too high a view of the capacities of *Homo* in comparison with those of some other animals of which we do, and can only know, at present, so little? Is it impossible for an evolutionist to imagine that the present mammalian age, with even *Homo*, may, in some undreamed and unimagined futurity, be relegated in importance to one great evolutionary succession to the Reptilian era as we think of it to-day? And this is not materialism, but its antithesis. There can be no cessation in the progress of evolution; stability may be apparent, but finality is beyond the bounds of the conception. To use the words of a recent writer:—"The mysterious battle, physical, moral, mental, spiritual, proceeds and must proceed for ever. Time is cheap, and we have all eternity before us" ('Hibbert Journal,' April, 1905).

British Bird Life; being popular sketches of every species of bird now regularly nesting in the British Isles. By W. PERCIVAL WESTELL. T. Fisher Unwin.

MR. WESTELL is becoming quite a prolific writer, and it is probable that this is the best book he has yet written. But does it supply a want? Sir Herbert Maxwell, in an introduction to the volume, appraises its value as "one which may be of lasting profit and pleasure to children reared in great towns." If this is so, the book will not have been written in vain.

It is somewhat remarkable in the domains of British ornithology and entomology, that the study of our birds or butterflies and moths should create such a sudden responsibility for writing another book on the subject. And when this resolve takes the form, as it usually does, of producing a handbook relating to all the members of our avian or lepidopteral fauna, compilation by necessity becomes the pronounced factor; for who can record sufficient original observation, or produce more new material than would occupy but few pages indeed? Now the art of judicious compilation is not a common gift of the gods! It demands encyclopædic reading with the judicial faculty of estimating what to ignore, what to pass by with a reference, and what to detail; it must also be abreast of the latest facts and records. Acting on this standard, it is not hypercritical to say that much might be taken out of this book as somewhat jejune, and much might well be put in the place of such lacunæ. According to Mr. Westell, "Works on *so-called* British birds are many, but books solely devoted to those species which regularly nest in our country are very few," and he has thought it well to add one more to the number. We have carefully read its pages, which are interesting, and contain what to some may be new; they also exhibit the writing of one who truly loves his birds and their environment; the illustrations are unequal in value, the photographs taken direct from nature contrasting very favourably with some "original drawings"; while the opinion of its sponsor that it may "be of lasting profit and pleasure to children reared in great towns," is, we venture to think, a fair and candid judgment.

The Fauna of British India, including Ceylon and Burma.
Edited by W. T. BLANFORD. Butterflies.—Vol. I. By
Lieut.-Col. C. T. BINGHAM. Taylor & Francis.

IN dealing previously with some of the families of Hymenoptera, Col. Bingham was, as were several other writers in this series, more or less of a pioneer, for that order of Insecta is still very incompletely represented in collections from British India. In butterflies the position is reversed: not only is immense material available for study, but much literature on the subject has already appeared, not only relating to the confines of the faunistic area included in the purview of these volumes, but also of neighbouring zoological territories; while the British Museum possesses a worked and classified collection which is unrivalled. In addition to these advantages, Col. Bingham has collected on the spot, and has aroused the enthusiasm of quite a number of other field entomologists, who have aided his task by the collection of specimens. Consequently we now have a digest rather than a contribution, a critical summary in place of the description of undescribed material, and an enumeration of species (if the author will allow us to use the term), which should at least, till the day arrives when their transformations shall be fully studied and recorded, be regarded with some amount of finality. We can therefore readily understand that the author of this book must have felt a considerable responsibility, and in going over the work of other writers with more limited opportunity, he must have frequently concluded that all that was recorded as new was not invariably true, and also the reverse. And this particularly applies to the great work now being published by Moore, whose specific and generic propositions receive little acceptance in the present volume, older views as to the sequence of families have acquired considerable modification, and Col. Bingham has also constructed his provisional genetic tree arising from a "Hypothetical Moth Ancestor." The families *Nymphalidæ* and *Nemeobidæ* are completed, and two more volumes are estimated as necessary to conclude the subject.

Col. Bingham has discarded the use of the term "species" as being tainted with "the evil connotations of pre-Darwinian times," and has adopted in its place another term—"form."

Perhaps, however, terms are immaterial in comparison with the conception which they convey, and as this depends not on the counters used, but on the plane of thought at which one has arrived, a change of word may not help so much as desired. If we do not use the word "species," why use the word "genus"? the last being a little more artificial than the first, at least in a philosophical sense. However, the writer shares with the author his dislike of definitions which may, or already have developed into rigidities, but at the same time thinks it better to enlarge the conception of a term rather than to duplicate it by another word.

This very useful volume possesses ten coloured plates, and some hundred photo-blocks distributed in the text.

EDITORIAL GLEANINGS.

“ *A Rook's Execution.*—On Wednesday morning about eight Rooks came into Christ Churchyard, Skipton, and tore in pieces the nest a Rook had made in a tree overhanging Cross Street. They pecked the Rook to death, broke the eggs upon which she was sitting, and she and the twigs were cast to the ground. Many neighbours saw this unusual occurrence. Natural history tells us of similar circumstances, but it falls to the lot of few to witness such an execution. Some Rook-law she had evidently broken, for which the death penalty was attached.”—*The Craven Herald, April 28th.*

“ *Robins' Nest on Waggon-axle.*—A few weeks ago a colliery waggon stood idle for a few days at Seghill, Northumberland, and during that period two Robins built their nest on its axle. Six eggs were laid, and then the waggon started on its journeys again. The parent birds followed it all the way to the Tyne, and their excited hovering round attracted such attention that an investigation was made, which resulted in the discovery of the nest. The waggon has now been placed on a siding to await the convenience of its feathered denizens, and six lusty young Robins have been hatched.”—*Evening Standard, May 8th.*

THE ‘Sussex Daily News’ of March 29th says that during the past winter members of the Bodle Street and District Rat and Sparrow Club,” near Herstmonceux (Sussex), killed 4143 Rats and Moles, 40 Stoats, 40 Rooks, Jays, Bullfinches, Magpies, and Hawks, 615 Blackbirds, Larks, and Linnets, and 2994 Sparrows, Starlings, “Greybirds,” and Chaffinches. The member who secured most heads and tails got a prize of £2, the second £1, third 15s. 6d., and fourth 7s. 6d. The rules of the Club provide that a fine shall be imposed on members failing to bring in twenty units every fortnight. Rooks, Jays, Bullfinches, Magpies, Hawks, and Stoats count three points; Rats, Moles, Blackbirds, Larks, and Linnets, two; Sparrows, Starlings, “Greybirds,” and Chaffinches, one.

As zoologists, we wish no prosperity to the "Bodle Street and District Rat and Sparrow Club." Herstmonceux is a locality which has shrined a more gentle and literary spirit.

WE learn that a Report on the Natural History Collections made in the Antarctic Regions by the 'Discovery' Expedition is to be published by the Trustees of the British Museum, and edited by Professor E. Ray Lankester, F.R.S., Director of the Natural History Departments. Already a long list of the names of naturalists are announced, to whom the working out of the collections has been entrusted. All enquiries concerning the zoological and botanical collections should be addressed to Mr. F. Jeffrey Bell, British Museum (Natural History), Cromwell Road, London, S.W.

WE have received the Report, 1903-4, of the Australian Museum (New South Wales). The acquisition of specimens continues to be dependent mainly on donations, supplemented by small purchases; by exchanges with other museums, and with private collectors; and by collections, the result of voluntary efforts on the part of members of the Museum staff and correspondents. The Curator having had opportunities of visiting Milton, the Darling River, and some of the Caves, and Mr. Chas. Hedley, of visiting Northern Queensland, with the authority of the Board, the result was the acquisition of numerous specimens for the Museum collections, and much valuable information. The additions to the library number 599 volumes, besides pamphlets and unbound parts of periodicals; and we notice in the balance-sheet that no smaller a sum than £422 18s. has been devoted to this excellent object.

"POSTAL ANOMALIES AND THEIR EFFECTS" is the title of a reprint of the speeches made in a debate in the Senate of Canada on Feb. 22nd of this year. Its importance to naturalists is found in the detrimental action of heavy postage in preventing a free circulation of scientific and other magazines in Canada. We learn from the speech made by Hon. Sir George Drummond, that a most serious discrepancy occurs in the postage rates for newspapers, magazines, and periodicals, which Canada conveys to England at the rate of half a cent per pound, while the rate from England to Canada is no less than eight cents per pound, and the rate from the United States to Canada is one cent per pound. It is difficult to imagine on what principle the Imperial

THE ZOOLOGIST.

Government proceeds in charging a rate of eight cents per pound. It is in itself a monstrous rate, equivalent to 175 dols. per ton, or say £36 per ton. It is well to consider the effect of this prohibitive rate, as compared with the rate charged by the United States, on the Canadian bookseller and distributors. The Canadian bookseller has this before him: If he accepts an order for a subscription for an English magazine or illustrated paper, he is in the first place charged eight cents a pound by the British post-office, and then he has to pay to the Canadian post-office one cent a pound in addition for the purpose of having his wares distributed, unless, indeed, he and the subscriber happen to be in the same city, when he can do it by hand without the intervention of the post-office. So he has to compete with an institution which can do business for three cents a pound, while, if he employs the legitimate post-office facilities, the postage on his wares amounts to nine cents a pound.

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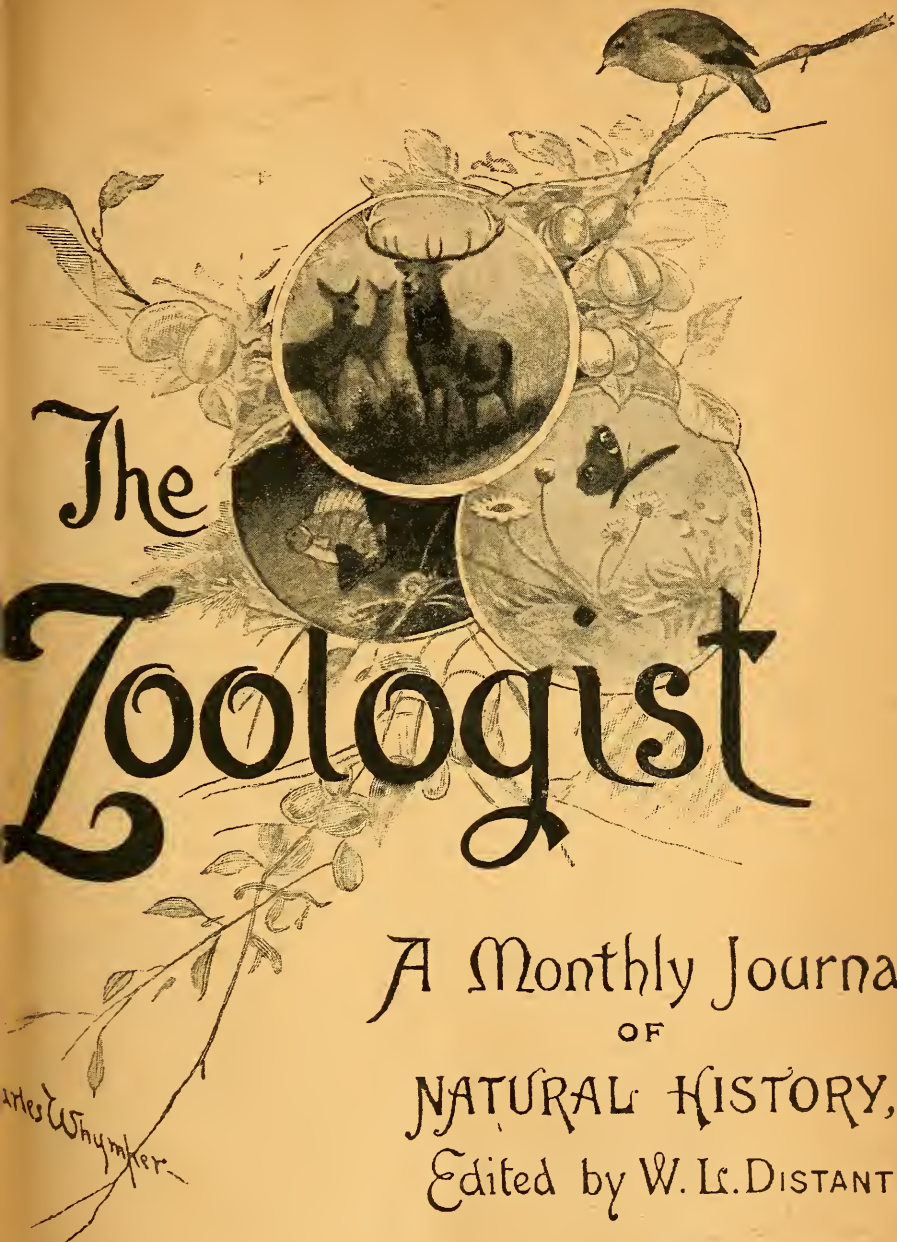
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THE BLACK ALEXANDRINE RAT, subsp. nov. (*Mus rattus ater*).

(From photographs by Douglas English, F.R.P.S.)

THE ZOOLOGIST

No. 768.—June, 1905.

THE TRUE POSITION OF *MUS RATTUS* AND ITS BRITISH ALLIES.

By J. G. MILLAIS.

(PLATE IV.)

OWING to the general confusion which has long existed in zoological nomenclature, the necessity for adopting some fixed rule for future guidance has gradually been forced upon us, and now I think that by far the greater majority of working naturalists are agreed that we must follow the law of priority. Whether a species is well or badly named it is best to adopt such a system for the purpose of eventual uniformity, and, though it is easy to find faults—and there are many glaring ones in this method—the general acclamation of the method would more than counterbalance its evident weaknesses in minor details. A recent report (1905) of a Committee appointed by the Zoological Congress (1895) to enquire into the desirability of its adoption unanimously voted in his favour, and all zoologists who wish to be in accord with their fellow-workers will do well to accept this dictum.

Of course there are dissentients—there always will be to every innovation. They will point to the case of the South African Eland of the Kalahari, a stripeless animal, which is evidently a local race, that by living under different surroundings has lost the stripes that belong to the parent forms of the

north. Yet this southern Eland was the first described, and must stand as the type, of which more recent discoveries are only subspecies. Other such instances of errors which we must accept by the adoption of the priority system could easily be noticed, and none, to my mind, are more glaring than that of *Mus rattus*.

The present case, that of retaining Linné's specific name for what is undoubtedly only a subspecies, is one of those errors which make one feel that one is only perpetuating a printer's mistake by using it. In self-defence it is therefore necessary to explain one's position. A name—a scientific name—should be descriptive, or, if the animal be a local form, it should be designated by the name of the locality in Latin. But how often is this the case?

Mus alexandrinus of Geoffroy is the eastern, and, according to the best evidence, the parent form of a Rat which reached Scandinavia from the east at a remote period. Here it became locally altered in colour, and Linné, only having this altered form or subspecies available, described it (Linné, Syst. Nat. ed. 12, vol. i. p. 83, 1766) prior to the time when Geoffroy wrote his description of *Mus alexandrinus* (Geoffroy, Descr. de l'Égypte, vol. ii. p. 753, 1812). We are therefore bound to adopt the name of *Mus rattus*, as given by Linné, for the whole species. But we are not necessarily bound to adopt this name for the parent form, which practically ranks as a species. I hope therefore that the formation of three new subspecies—one of them being a newcomer to England, and, in fact, a new subspecies altogether—will simplify matters, and propose to use the following nomenclature in the second volume of 'The Mammals of Great Britain and Ireland,' which I have in preparation.

THE BLACK RAT (*Mus rattus*, Linnæus).

Mus rattus, Linn., Syst. Nat. ed. 12, vol. i. p. 83 (1766); Bell, Brit. Quad. 2nd ed. p. 302 (1874); Blanford, Mamm. Brit. India, p. 406 (1891); Lydekker, Brit. Mamm. p. 191 (1895); Johnston, Brit. Mamm. p. 241 (1903); Thomas, Zool. 4th ser. vol. ii. p. 100 (1898).

M. alexandrinus, Geoffroy, Descr. de l'Égypte, vol. ii. p. 753 (1812); Thomas, Proc. Zool. Soc. (1881), p. 533.

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LOCAL NAMES.—Black Rat; Old English Black Rat; Alexandrine Rat (English). Black Ratton; Blue Rat (Scottish). Rodan-dubh; Radan-dubh (Scotch Gaelic). Llygoden fferngig (Welsh). “French” Mouse (Irish).

CHARACTERS.—The “Black” Rat is not so stoutly built as the Brown Rat, and it has a proportionately longer tail and larger ears. The tail is generally, but not always, longer than the head and body, and the ears are about half the length of the head. Mammæ, 10 or 12.

Three well-marked races of the so-called “Black” Rat exist in our islands, and the fact that all interbreed freely* has led to some confusion amongst naturalists, who perhaps have only had the opportunity of handling a few specimens. I have examined a very large series of the species taken in different localities within the past fifty years, and consider that there are three distinct races, namely, the Alexandrine Rat, the British Alexandrine Rat (*i.e.* the misnamed Old English “Black” Rat), and the Black Alexandrine Rat. The first mentioned is undoubtedly the true species, of which the two last named are subspecific races.

Subspecies 1.—THE ALEXANDRINE RAT (*Mus rattus alexandrinus*).

The colour on the upper surface of this race is very similar to *Mus decumanus* (the Brown Rat), yellowish brown, intermixed with black hairs. The black hairs predominate, and are longest over the thighs and rump. The ventral surface, breast, throat, lower lip, and edges of the limbs are yellowish white. The upper part of the fore legs and along the line of demarcation between the two surfaces is pure grey. Compared with *Mus rattus ater*, the coat seems somewhat sparse. Tail long and furnished with rings of scales, and covered with short black lines. Ears large, naked, and well rounded; vibrissæ long and black. Soles naked and yellowish.

Measurements of an adult male from Yarmouth :—Head and

* M. de L’Isle made experiments with interbreeding, and concluded that *M. rattus* and *M. alexandrinus* were geographical races of the same species, and that *M. alexandrinus* was the older and parent form.

body, 9 in. Tail, $7\frac{1}{2}$ in. (generally thicker at the base, and shorter than in the other subspecies). Hind foot, 35 mm.

This is apparently a recent arrival in England; the true type as described above appears to have reached both Scotland and Ireland. It is most commonly found inhabiting the coast ports on the east and south of England, and is very numerous on board ships trading in Southern Europe. Of its original home we are uncertain, but the supposition that it is an eastern form is probably well founded.

Subspecies 2.—THE NORTHERN ALEXANDRINE RAT
(*Mus rattus rattus*).

This, the most common type, has always been known as the "Old English" Black Rat. Early in the last century it was abundant nearly all over the United Kingdom, but is now becoming scarce and very local. It has been erroneously called the indigenous type, but there is little doubt that it arrived from the east, probably from Western or Central Asia (possibly Western Mongolia) by way of Russia and Germany, or on board ships from the Black Sea ports.

In colour the name "Black" Rat is a misnomer for this northern race, as it is not, properly speaking, black.* The upper surface is greyish black or brown, interspersed (behind the shoulders) with glossy white hairs, and the whole upper and lower parts have a blue-grey or purple in them when viewed in the light. The under fur, which is sparse, is pure grey. The ventral surface and limbs are slaty grey. These slate-coloured hairs become thin on the upper surface of the feet and toes; the soles are naked and yellowish; the toes small and bone-coloured. The tail is ornamented with scales which form rings from root to end, and is covered with short black hairs; the ears are large, naked, and well rounded; the eyes black and prominent; the vibrissæ fairly numerous, long, and black in colour. Average length of head and body, 7 in. A very large male from Yarmouth now before me measures $8\frac{1}{2}$ in.; tail, 9 in.; hind foot, 35 mm.

* Linnæus did not call it black; he speaks of it as "corpore fusco," and otherwise refers to its dusky colour. Pennant probably gave the superficial name of "Black," which has remained ever since. "Blue" would have been more appropriate.

Subspecies 3.—THE BLACK ALEXANDRINE RAT, subsp. n.

(*Mus rattus ater*).

This well-marked race, which is a very recent arrival on our shores, deserves some such title as has been suggested by Mr. O. Thomas, for it is now a well-marked race, and occurs by itself in several places where the *M. r. alexandrinus* and true *M. r. rattus* are apparently unknown.

The whole of the upper parts of this variety are glossy black, which in bright light has a curious green sheen, and the pelage deeper and richer than in the two other races; the minor and terminal portion of these hairs are jet-black, and the major or hidden portion is white or grey; the lower parts dusky grey. Ears, vibrissæ, feet, and measurements identical with the last-named subspecies. Tail not so thick at the base as *M. r. alexandrinus*, and slightly longer.

The Black Alexandrine Rat is a native of the Black Sea ports, although its original home is, like that of the other races, unknown. Its habits are similar, and it is a great traveller on board the grain-ships, and has doubtless reached many out-of-the-way places of which at present we are ignorant. I saw what I believe to be a Rat of this subspecies lying dead in a Kaffir village about fifty miles north of Pretoria; and was informed that they were common there, and that the "Blue" variety was not known. These Rats had doubtless worked their way up from Johannesburg, *viâ* Delagoa Bay. It is, I believe, also found in several of North African sea-ports. I first heard of this race as an inhabitant of London in 1900, but it was not until 1904 that I obtained two fine specimens from Messrs. Courage & Co.'s Brewery, Horsleydown, London, S.E., where they have been found in company with both *M. r. alexandrinus* and *M. r. rattus*. Mr. Douglas English, whose excellent photographs of the animal accompany this article, has also known of them for some time, and has kept several in captivity, which he has kindly sent me for examination. These were also taken in London, and so far I have not heard of it in any other British sea-port. After examining over one hundred specimens of "Old English Black" Rats—that is, old examples that have been killed in inland places during the past fifty years, and were undoubtedly examples of the race that is now nearly extinct—I have not found one that

was Black like the present subspecies, and have only found hybrids between the two in London, where the Black race exists.

All the three above-mentioned races are sometimes found frequenting the same town, and, as previously stated, will breed freely with one another, and prove their original identity. Thus we often see, in a collection of specimens, Rats of this species presenting every intermixed condition of fur which may occur between the very black form and the pale white-bellied one. Black Rats with white chests, paws, and sometimes whitish whiskers are common, as well as yellowish brown examples with blue-grey under surfaces. This is most noticeable in London, where the docks are constantly receiving fresh supplies of the different subspecies from the east, and which make their homes about the Docks, Ratcliffe Highway, and Thames Street. I have examined every type from this one district of our metropolis.

I think that this species may very occasionally interbreed with *M. decumanus*, but I have never seen an example, nor has Mr. Douglas English, who has long kept both species, succeeded in obtaining a cross. Melanic varieties of *M. decumanus* and variations of the present species are constantly described as such hybrids.

The scientific reader may question the necessity of describing the foregoing as new subspecies without according similar subspecific rank to the melanic variety of *Mus decumanus*, for some time known as *M. hibernicus*. The answer to this is that the dark form of the last named is not constant, nor has it developed into a sufficiently extensive race, inhabiting a certain area, of which we can take notice. After all, the difference between a variety and subspecies is a most difficult one to describe. All subspecies have their commencement in a slight variation from the normal type, which is altered and developed according to circumstances and local environment. When that variation is small and sporadic in distribution it is called a variety, but if a variation becomes well marked and constant, and its members dominate a district, island, or area of land, as in the various races of *Mus rattus*, I think we are entitled to name its members as belonging to a subspecies.

The following measurements, in inches, of the three races have been taken (in the flesh) by Mr. Lionel Adams and myself:

Subspecific Race.	Sex.	Head and Body.	Tail.	Ear.	Vi-brissæ.	Back Hairs.	Weight in oz.	Locality.
1. <i>M. r. alexandrinus</i>	♂	9	7½	1	2¾	1½	—	Yarmouth.
2. "	♂	6¾	—	—	2	1½	4	Woolwich.
3. "	♂	7	—	1	2¾	1¾	5	"
4. "	♂	8½	7½	¾	2½	1½	8	"
5. "	♀	8	7¾	¾	1¾	1	6¼	"
6. "	♀	6⅝	7⅝	⅞	2	1⅞	3½	"
7. "	♀	7⅞	8½	—	2⅝	1	5½	"
8. "	♀	—	8⅞	—	2	1¼	5	"
9. <i>M. r. rattus</i>	♂	7½	8½	1	2	1¼	4¾	"
10. "	♂	7½	7¾	1	2	1¼	3¾	"
11. "	♀	—	8⅞	—	2	1¼	5	"
12. "	♀	7½	9	1	2⅝	1	5¼	"
13. <i>M. r. ater</i> (type)	♂	9½	9½	1	2¾	1¾	—	London, S.E.
14. "	♂	7¾	8¾	1	2	1¾	—	"
15. "	♂	8½	8¾	1	2	1¾	—	"
16. "	♀	7¾	8¾	1	2	1¾	—	"
17. "	♀	8¾	broken	1	2¾	1¾	—	"

The hind foot is generally 1½ in. The skulls and teeth are similar, and have been described too often to require explanation.

BIRDS SEEN IN EGYPT IN DECEMBER, JANUARY,
AND FEBRUARY.

BY FLORA RUSSELL.

THESE notes may be of interest as showing what an ordinary tourist with good field-glasses may see. I landed at Port Said on the 11th December, 1904, was in Cairo from the 12th to the 29th; spent four days in the Fayum, went up the Nile by steamer to Wadi Halfa, stopped a few days at Assuan and Luxor, and another fortnight at Cairo before leaving Egypt on Feb. 27th.

Anyone who has read Shelley's 'Birds of Egypt,' and remembers his constant observation of "a very abundant species everywhere," will be much disappointed when he first arrives in the country. But when he remembers the enormous increase of steamers on the Nile in the last thirty years (Shelley's book was published in 1873), he will be glad that he saw the river before it was quite depopulated of birds.

At Port Said a few Mediterranean Herring-Gulls (*Larus cachinnans*) flew about the harbour. In Cairo the Egyptian Kite (*Milvus aegyptius*) was the most striking bird. Scores were always in sight, swooping over the roofs, and resting on the telegraph-poles and chimneys. They are abundant all the way up the river to Wadi Halfa, and one is soon familiar with their shrill but pleasing note. The Hooded Crow (*Corvus cornix*) was as common in the streets as along the mud-banks of the Nile. The House-Sparrow (*Passer domesticus*) was abundant; the boats loaded with grain were thickly covered with them. The White Wagtail (*Motacilla alba*) was to be seen everywhere; they constantly came on to our steamer in search of crumbs.

At Gizeh Zoological Gardens there is a pond where many Wild Ducks join the tame ones. I saw Teal (*Nettion crecca*) and Shovelers (*Spatula clypeata*) in December, and in February many Pintails (*Dafila acuta*), Mallard (*Anas boscas*), and a few Wigeons (*Mareca penelope*). In the middle of February they were beginning to diminish in numbers. The majority seemed to be

Shovelers. On an island in the same place a great flock of Night-Herons (*Nycticorax griseus*) roosted thickly in the trees, a few occasionally flapping about. About half were in mature plumage, and very conspicuous. They leave the Gardens in May, and return in August with their young, but some come sometimes and look at the place in between.

Several minute Warblers were catching insects on the shrivelled lotus plants, but Willow-Warblers (*Phylloscopus trochilus*) were the only ones I could name. These I often saw on shrubs in Cairo gardens. The Oriental Swallow (*Hirundo savignii*) was always to be seen on Gezireh, and round the Fayum lake there were thousands of them. In the desert beyond the Mokattam Hills I saw a few pairs of the inconspicuous Desert Lark (*Ammomanes deserti*). The Pied Wheatear (*Saxicola lugens*) I saw in several spots in the desert, but it was never abundant. The Desert Wheatear (*S. deserti*) I only saw once, at Gizeh. In the fields west of Bulak Dakrur, where I went with Snipe-shooters, I added to my list the Bluethroat (white-spotted variety) (*Cyanecula wolffi*), a skulking bird; one was in song, a pretty warble. The Spur-winged Plover (*Hoplopterus spinosus*) was common, but I never saw large flocks as I did of the Lapwing (*Vanellus vulgaris*). I saw also the Green Sandpiper (*Totanus ochropus*) (seen again in the Fayum), the Southern Little Owl (*Athene glaux*) (frequent also up the Nile), a Short-eared Owl (*Asio accipitrinus*), the Kingfisher (*Alcedo ispida*), and a party of Little Egrets (*Ardea garzetta*). The Little Egrets I saw again near Dendera, unmistakable with their black legs and feet and yellow soles.

Snipe (*Gallinago caelestis*) were plentiful in the still swampy cotton fields, and we saw many Teal. On the way home a large flock of Pelicans passed over. These and a pair near Ayat, which were of the Roseate species (*Pelecanus onocrotalus*), were the only ones I saw. They must be decreasing in numbers. Shooting is forbidden from the deck of Cook's steamers, but visitors to an hotel at Assuan are invited to join "la chasse aux Hérons et aux Pélicans," which is organized once a week. At Medina, in the province of the Fayum, there were pools with Waders, and among them the Little Ringed Plover (*Ægialitis curonica*) and the Marsh Sandpiper (*Totanus stagnatilis*). Hoopoes

(*Upupa epops*) were common here, and in most places up the Nile. Starlings (*Sturnus vulgaris*) I only saw in the Fayum.

Kestrels (*Falco tinnunculus*) swarmed, and Crested Larks (*Corydus cristatus*) were in every field (these were numerous at Luxor too); Little Owls sat on the dykes, and Egyptian Swifts (*Cypselus murinus*) sped over our heads as we approached Lake Karun. The lake is covered with wildfowl, and many happy hours might be spent in watching the birds on it; but the traveller should bring his own small boat with him. It was a disappointment only to cross the water in the enormous native boat; we never got near the innumerable Ducks, and I only made out Tufted Ducks (*Aethya fuligula*) and Shovelers. Red-shanks (*Totanus calidris*) waded among the tamarisk bushes at the edges, less noisy than usual. Gulls were flying over the water and crying loudly. The only one I identified was the Little Gull (*Larus minutus*), just shot by a German tourist, who described his three days in the visitors' book as "Splendid sport! Bag: 1 Gull, 1 Duck, 1 Flamingo."

I saw nine Flamingos (*Phœnicopterus roseus*) wading and swimming; only two had their pink plumage. All the way up the Nile I only caught sight of one of these birds, but there were immense flocks on Lake Menzaleh, to be seen from the train on returning to Port Said.

Amongst numerous White Wagtails who were bathing in a flooded bean-field, I discovered several of the Grey-headed species (*M. viridis*). At Lahun a pair of Green Bee-eaters (*Merops viridis*) perched on the telegraph-wire. These are the resident species, which Shelley says do not usually come north of Golo-saneh. I saw another pair near Luxor.

Some Bulbuls (*Pycnonotus arsinoë*) were very lively in a garden at Medina, and I saw the Graceful or Streaky Warbler (*Prinia gracilis*) there for the first time. Another Warbler answered to the description of Rueppell's Warbler (*Sylvia rueppelli*), but I cannot be certain of it.

The first day on the river after leaving Cairo was much the best for birds. We ran every few miles into flocks of from three to five hundred Ducks, which rose and flew round in front of the boat before settling down behind it. Pochard (*Aethya ferina*), Teal, Pintail, Shoveler, and Mallard among them. Rows of

Hérons (*Ardea cinerea*) stood on the sand-banks, fifty to sixty sometimes together. To escape the fury of a dust-storm they stood facing the wind, their long bodies, at a right angle to their legs, looking like the letter T. I saw three or four Cranes (*Grus cinerea*) among many Spoonbills (*Platalea leucorodia*). These were in large parties between Deshna and Dendera; I saw none further south.

The Long-legged Buzzard (*Buteo ferox*) was often to be seen, sitting motionless on the banks. The Black-winged Kite (*Elanus caeruleus*), less common, was usually disturbed by the passing steamer. The Osprey (*Pandion haliaëtus*) I only saw once.

The Egyptian Vulture (*Neophron percnopterus*) was common at Assiut, and in several places further south. In Nubia, where birds were altogether rarer, I saw them occasionally. Among some at Assiut were three Black Vultures (*Vultur monachus*) fighting over a carcass in the river. A pair of Griffon Vultures (*Gyps fulvus*) I saw at Baliana, and more at Dendera, sitting, apparently gorged, and peculiarly unattractive with their bare heads. A large brown Eagle was probably the Spotted Eagle (*Aquila maculata*), but it might have been Bonelli's (*Hieractus fasciatus*). The pale Crag-Martin (*Cotile obsoleta*) was plentiful at Beni Hassan and other rocky places; they were common in Nubia too. The Brown-necked Raven (*Corvus umbrinus*) I saw occasionally below Luxor, but not often; the Abyssinian Raven (*C. affinis*), with its peculiar sailing flight, only near Korosko.

The day between Tema and Baliana was marked by Black Storks (*Ciconia nigra*); over thirty in twos and threes were wading in shallows. At Sohag a dozen with as many White Storks (*C. alba*) made a delightful picture. The latter I only saw between Sohag and Keneh.

The Common Sandpiper (*Totanus hypoleucus*) was rare: two birds on the river, and another at Karnak lake. This small sacred lake near the temple was the resort of a pair of Coots (*Fulica atra*), Pochards, Tufted Ducks, Little Ringed Plover, Black, White Kingfishers (*Ceryle rudis*) (common everywhere), Hoopoes, numerous Swallows and Crag-Martins. Before Luxor I saw what can only have been the White-headed Duck (*Eris-matura leucocephala*), and, later on, two Egyptian Geese (*Chenalopez ægyptiaca*). Another pair flew down to the river south of

Shellal, the black and white of their wings so conspicuous in flight, and so hidden at rest. Here two pairs of the Red-faced Chanting Hawk (*Melierax gabar*) flew along the banks.

I was unable to explore the islands of the First Cataract, and only observed the White-winged Wagtail (*Motacilla vidua*), confined to that district, the Black Wheatear (*Saxicola leucura*), and the Sardinian Warbler (*Sylvia melanocephala*), which was frequently to be seen on Elephantine Island. The delicately coloured Black-headed Plover (*Pluvianus ægyptius*) was rare—one pair at Wasta, another near Sohag.

Gulls and Terns were few and far between on the Nile, and I could not make out the species of the few I saw. Some Shrikes and Warblers, too, remain unidentified, as well as some Waders, though I feel pretty sure I saw Kentish Plovers, Little Stints, a Ruff, and a Curlew.

The Redbreast (*Erithacus rubecula*), Blackbird (*Turdus merula*), and Stonechat (*Pratincola rubecula*) were represented by single specimens of each, and Thrushes (*Turdus musicus*) by three or four, chiefly in the beautiful Barrage Gardens. The Rock-Dove (*Columba livia*) is abundant, but semi-domesticated. The Egyptian Turtle-Dove (*Turtur senegallensis*) I saw several times in palm-groves. Perhaps the pleasantest sight was half a dozen Cream-coloured Coursers (*Cursorius gallicus*), running among the sparse vegetation at the edge of the desert near the Gizeh Pyramids.

This makes seventy-four species identified to my satisfaction.

NOTES ON THE BIRDS OF ANGLESEA.

BY T. A. COWARD & CHARLES OLDHAM.

IN the spring of 1904 we again* visited Anglesea, paying special attention to the coast, which we worked from Carmel Head, in the north-west of the island, to the western shore of the Malldraeth Estuary. We made several excursions to the lakes and marshes inland, and one of the writers spent a few days near Beaumaris. Much of the country between Holyhead and Bodorgan was well known to us, for during the past twenty years we have on several occasions visited that district, but we also broke a good deal of new ground. We again had the advantage of Mr. S. G. Cummings's companionship, and have to thank him once more for placing at our disposal the notes he had made on previous visits to Western Anglesea.

South of the high cliffs in the neighbourhood of Carmel Head the coast is rocky and indented, but the cliffs are not of sufficient height to afford nesting-places for Gulls, and the boulder-strewn beaches of the shallow bays are unsuited for the Ringed Plover and Lesser Tern. Kestrels nest on these low cliffs, and the Stock-Dove is abundant; on June 2nd we counted twenty-five Stock-Doves feeding with domestic Pigeons in a field near Llanfwrog. At the mouth of the River Alaw, however, there is an extensive warren, where the dunes in spring are spangled with the variegated flowers of *Viola curtisii*, and considerable stretches of sandy beach. Here many Sheld-Ducks breed among the sand-hills, and at low tide are scattered over the mud-banks in the estuary and bay. On May 29th, when we visited the place, the plaintive cries of Ringed Plovers, which nest in some numbers on the sandy shores, were to be heard everywhere. At that date most of the birds had young, though we saw one nest with four and another with a single egg. A noisy Redshank was apparently interested in a brood, but we

* Cf. Zool. 1902, p. 401; 1904, p. 7.

failed to find the young ones. A small colony of Lesser Terns nest on the beach ; several birds were fishing at the river-mouth, and we found two nests containing eggs on the shingle.

Holy Island, or Holyhead Island, the most westerly part of Anglesea, has on its north side the busy seaport of Holyhead, but the population and the bustle and noise incidental to the important railway and steamship traffic are concentrated within a comparatively small area ; to the west of the town the coast is little frequented, save by visitors to the South Stack Lighthouse. In the breeding season the rugged and precipitous cliffs between the town and the Stacks, and thence southward to Penrhyn-mawr, are resorted to by many birds.

Within a mile of the breakwater a pair of Merlins were nesting on the slope above the cliffs, while there is a Peregrine's eyrie not two miles from the town. Even if the angry barking of the falcon, as she flew in wide circles over the sea and cliffs, had not proclaimed the fact, the scattered feathers of slaughtered Stock-Doves and domestic Pigeons would have shown that the birds were nesting here. On June 1st we made out two young Peregrines scrambling about on a grassy ledge half-way down the sheer cliff ; their primaries and tail-feathers were distinctly visible through the down. The tiercel, as so frequently happens, disappeared when we had only been in the neighbourhood a few minutes, but so long as we remained in the vicinity—fully an hour—the falcon, though more wary than others we have met with, was never far away ; the crags rang with her fierce bark. Once or twice she settled on one or other of two grassy ledges at a little distance from the nest—these birds always use certain points of vantage as look-out stations—but for a long time she would not go to the ledge where the young ones were ; at last she did so, and then we discovered them.

A week later we visited another Peregrine's eyrie, some miles to the south-east. Although we failed to see the nestlings, there was no doubt that the pair had young, for there were feathers of slaughtered victims in several places on the ledges of a grand cliff in which the falcon evinced special interest. She flew out over the sea and along the cliffs, barking defiance, for more than half an hour before she settled on a small ledge which projected from the vertical cliff-face. The tiercel remained

about the bay, but did not approach so closely as the falcon. Once a second tiercel appeared on the scene, and the two males were out over the sea together for some minutes. One—perhaps the falcon's mate—mounted again and again above the other, and stooped at it; the bird attacked always swerved aside, apparently just avoiding collision. One, or possibly both, uttered a screaming cry, quite different from the ordinary barking note of alarm. On June 2nd we visited the eyrie on the north-west coast which we described last year. The birds had again resorted to the same niche, and on the narrow ledge were three young birds, and an unhatched, or, possibly, addled egg. The young birds were smaller than those we had seen on the previous day; they did not scramble about, but lay prone and motionless. The falcon was noticeably paler than the one near Holyhead. Here, as at the other eyries, we remarked a difference in the alarm-note of the sexes; that of the falcon is "hek, hek, hek," and is usually repeated more quickly than the "hak, hak, hak" of the tiercel. A pair of Peregrines nested this year on an overhanging limestone cliff near Peumon. We started the falcon from the nest on April 30th, when she flew out over the sea without a cry and disappeared.

* The Herring-Gull is *par excellence* the Gull of the North Wales coast. There is a large colony on the cliffs between the North and South Stacks, and another a little to the south of the South Stack; scattered pairs nest along the cliffs as far as Porth Dafarch, but from the South Stack itself the bird has apparently been banished. Several pairs used to nest on the grass beneath the lighthouse-wall; in May, 1886, we saw them nesting here, and even so late as 1892 a number of young birds, still unable to fly, were standing on the grassy slope within a few yards of the lighthouse buildings.

Harried by visitors, and also by the lighthouse-keepers, the birds have sought an asylum on the inaccessible cliffs opposite the rock, a reversal of what, according to Bishop Stanley ('Familiar History of Birds'), took place when the lighthouse was in course of construction. The Gulls (which by the way he miscalled *Larus canus*) bred in vast numbers on the rock prior to the erection of the lighthouse. Blasting operations and the busy work of construction drove them to the cliffs, where they

were harried by egg-robbers; when the buildings were completed they gradually returned to the island, receiving encouragement and protection from the keepers, and there they continued to nest until recently. In an article in 'Blackwood's Magazine' for 1831, which, though unsigned, appears to have been written by Bishop Stanley, mention is made of a heronry on the rocks opposite the Stack; no Herons nest here now.

The Kittiwake, so far as we know, does not nest on the cliffs of Holy Island, nor, indeed, anywhere on the western or south-western coasts of Anglesea. We have not seen the Lesser Black-backed Gull on this coast in spring, but have met with it near Holyhead in October. An adult Greater Black-backed Gull was flying over the sea near the South Stack, and we saw an immature bird consorting with some Herring-Gulls on one of the reservoirs on Holyhead Mountain, but the species does not appear to nest in the immediate vicinity of Holyhead. Guillemots and Razorbills breed in large numbers on the cliffs near the South Stack; the ledges occupied by the Guillemots conform with the curiously contorted strata of the rock. An excellent view of the long lines of birds, undulating with the whitewashed ledges, may be obtained from the zigzag stairway which leads down to the Stack from the cliffs above. On May 30th the birds were standing or lying prone upon the ledges in hundreds, but egg-laying did not seem to have begun, for we could see no eggs. Many Razorbills were brooding in holes and crevices, and the water at the foot of the cliffs was thronged with birds of both species, while others constantly passed to and from the ledges. Puffins were on the water in some numbers, but they had not then taken possession of the grassy slopes where they nest. On May 15th, 1898, Mr. Cummings saw a few Puffins on the grass beside the stairway, and on July 17th, 1902, we saw many on the ledges, and one sitting at the mouth of its hole on the Stack itself; one of the lighthouse-keepers told us that few now nest on the Stack. Some of the birds occupied holes on the grassy slope within a few feet of the stairway wall, where there are many rabbit-holes; but others had their tunnels on grassy ledges cut off by perpendicular cliffs. Rabbits could not reach these ledges, so that the birds must have excavated the holes themselves, which, judging by the honeycombed condition of

most Puffin colonies, is what they frequently do. Some birds were evidently brooding in cracks and crannies in the rock where there was no turf.

We saw a single Shag fishing near the North Stack on June 4th, and Cormorants are familiar objects on this rock-bound coast. Two pairs of the latter species were nesting on a vertical cliff between the Stacks, and a colony of at least fifteen pairs occupied some overhung ledges to the south of the South Stack.

The indented rocky coast south-west from Penrhyn-mawr to the strait which separates the island from the Anglesea mainland has no cliff high enough for Gulls or Cormorants to nest on; and, as on the west coast, the little bays lack sufficient beach to attract Ringed Plovers and Lesser Terns. The Oystercatcher, however, abounds here, as indeed everywhere in Anglesea; the low broken cliffs and isolated stacks afford abundant nesting sites. In spring and early summer the turf above these low cliffs is ablaze with flowers; after the primroses and vernal squills have faded, bluebells and sea-pinks come to perfection; sea-campion in great white masses, and other plants which do not flourish in more exposed situations, mantle the walls of the deep narrow fissures, where Carrion-Crow and Kestrel nest. Here and there between the South Stack and Porth Dafarch one sees the striking yellow flowers of *Senecio spathulæfolius*, one of the most local of our British plants.

At Rhos Colyn, some four to five hundred yards from the shore, are two low bare stacks, which are occupied by a large colony of Arctic Terns. As a rule, apparently, this species is later in nesting than the Common Tern. On June 12th, 1903, and on the same date the year before, many Common Terns in the colony at Ynys-yr-adar had incubated eggs, but on June 9th this year there were no Arctic Terns on the Rhos Colyn stacks, though the birds were fishing at sea. On June 12th, 1897, when we visited the stacks, we found only one egg, but on June 19th, 1891, there were hundreds—fresh, or but slightly incubated. In some cases the scanty nests were made of the long tufted lichen which the birds had plucked from the rocks; in several instances the eggs were laid on dried grass-stems or a few Rabbit-bones, which the birds must have carried from the land, for there are no Rabbits on the stacks, nor, indeed, is there any vegetation

but lichens. Often the eggs were placed on the bare rock, no attempt having been made to build a nest. On July 30th, 1884, eggs were still plentiful on the stacks; although there were many young birds about there were also fresh eggs; no doubt the first clutches had been taken. In 1892, however, the birds appear to have been earlier than usual, for on June 6th most of the eggs—and there were great numbers—were more or less incubated; a few were even chipping.

On the Anglesea mainland, between Cymmeran, where the strait is little more than a stone's-cast wide, and the Crugyll estuary at Rhos Neigr, is a long stretch of sand-dunes, where many Sheld-Ducks and Stock-Doves breed in the Rabbit-holes. Ringed Plovers nest on the sandy shore and on the big pebble banks at the mouth of the Crugyll. Here, too, there is a colony of Lesser Terns, perhaps consisting now of a dozen pairs, although twenty years ago, when Rhos Neigr was but a hamlet, more than double this number nested. Even then the fisher-lads persecuted the birds, and now the visitors give them little peace. This year, on June 6th, a bitter east wind was blowing, and the eggs in some of the nests were all but covered by the drifting sand. On that day two Dunlins, in company with six Sanderlings, were feeding on the beach; with them were two Ringed Plovers, apparently examples of the small migratory race, for they were obviously smaller and of slighter build than the birds which were nesting in the immediate neighbourhood. We followed this little party along the tide-line; when we put them up, as we did several times, the birds only flew for a few yards, keeping together all the time. When feeding the Dunlins ran with the tips of their long bills close to the ground, occasionally probing the sand, but the Sanderlings carried their heads higher, and pecked at their food in the same manner as Ringed Plovers. We saw three other Dunlins in full breeding dress by the side of the river. In former years we have often seen Dunlins in summer plumage in Cymmeran Bay and the Crugyll Estuary in May and June, and less frequently have met with parties of Turnstones. On May 23rd, 1892, eight Turnstones were feeding along high-water mark, turning over the dried seaweed to obtain the sandhoppers concealed beneath. This year we came across eight on the rocky shore near Llan-

gwyfan on June 10th. These June birds are laggards, for by that time most of the Turnstones have gone north. In October Turnstones and Redshanks are abundant on the rocky parts of the coast.

South-west from Rhos Neigr the coast is rocky, with a few sandy reaches in the bays, and a break of some extent near Aberffraw, where the south bank of the River Ffraw is flanked by a broad stretch of sand-dunes. The cliffs do not rise to any great height until the bold headland of Pen-y-Parc is reached. This headland overlooks the Malldraeth sands, and beyond the estuary the desolate wastes of Newborough Warren. Carrion-Crows and Kestrels breed in some numbers along the low cliffs. One Kestrel, alarmed by our sudden appearance on the beach below her nest, left so hurriedly that she kicked a downy young one on to the sands below. We again (*cf.* Zool. 1904, p. 29) saw a Kestrel carry off a Starling. Our attention was attracted by a commotion in a hedge where Blackbirds, Starlings, a Sky-Lark, and a Reed-Bunting were clamouring; from their midst rose a Kestrel, bearing in its talons a young Starling, and with evident labour made off towards the coast. The Wheatear is fairly common here; on the west coast, except at Carmel Head, we met with only one pair—at Llanfwrog—and saw none between the North Stack and Rhos Colyn. The Rock-Pipit is abundant, as it is wherever the coast is rocky. Colonies of Jackdaws occur here and there, especially where the rocks are overgrown with ivy; near Llangwyfan some farm-lads were dragging the young ones from nests in the ivy to make into pies. At one of the colonies we saw a Carrion-Crow hotly pursuing a Jackdaw which was carrying food to its nest; it desisted, however, when a number of Daws and a Kestrel mobbed it.

The Merlin is not so common here as it is on the north coast; near Rhos Colyn one resented our appearance on the cliff, but we saw nothing of a pair which, in previous years, we had seen near Llangwyfan. There is but little ling on the brows above the cliffs here, and the birds have to seek other nesting sites. In 1891 this pair laid in an old Carrion-Crow's nest in an exposed position. On June 18th there were three young ones whose quills and tail-feathers were just appearing through their whitish-grey down. When handled they gamely threw themselves on

their backs, and fought with beak and talon. The old birds meanwhile were flying about the cliffs, greatly excited, uttering shrill whistling screams; the small blue male remained at a more respectful distance than his mate; she passed repeatedly within a few feet of us. Scattered feathers of Rock-Pipits and Wheatears along the edge of the cliffs showed where the birds had plucked their victims. In 1892 the eggs were laid on a narrow grassy ledge, not far from the nest of the previous year; in 1897 the nest of a Crow was again utilized, but the birds were molested, and when, on June 11th, we visited the spot, we found the broken eggs beneath the overturned nest. The male bird was nowhere to be seen, but the hen was about the cliffs. In June, 1901, Mr. Cummings saw a pair of Merlins, and found the nest beneath some brambles on the cliff about half a mile from the old station.

A pair of Greater Black-backed Gulls used to nest near Llan-gwfan on a stack accessible at half-tide. We saw nothing of the birds there this year, nor did Mr. Cummings in 1901, but we did not go out to the stack to look for the nest. On June 18th, 1891, there was an addled egg in a nest in the short grass on the higher part of the stack, and two downy young ones of unequal size were squatting on rock a few feet away. On June 10th, 1892, we saw the empty nest, and obtained, at a neighbouring farm, an egg which had been taken by one of the farm-lads from it. On June 7th this year we found a pair nesting on the summit of a bare isolated stack west of Pen-y-Parc. The old birds rose when they caught sight of us, and sailed high overhead, uttering a guttural "ugh, ugh," and another cry similar to the "ag, ag" of the Herring-Gull. They mobbed and buffeted a pair of Carrion-Crows until they drove them from the neighbourhood. From where we stood on the cliffs we could, with a telescope, see an addled egg in the nest, and two small nestlings moving about near to the nest; the young of this Gull seem to habitually vacate the nest soon after they are hatched. Presently a second pair of Greater Black-backs joined the others; for some minutes all four circled above the stack, barking in concert; then the new-comers retired. An hour later we came across two pairs on the summit of Pen-y-Parc; perhaps one pair were the birds we had seen earlier, for we could only find a

single nest. All four birds, however, flew to and fro with the Herring-Gulls, clamouring incessantly; they certainly behaved as if both pairs were nesting. The nest we found here was a flat structure of sea-pink and grass torn up by the roots, placed on the bare rock at the highest point of the headland. Two young birds—pale grey tinged with yellow, and boldly spotted with black, legs and bill lead-colour—were crouching close together about three feet from the nest. They could not have been long hatched, for the horny nails were still on the tips of their bills. The coloration of the nestlings is eminently protective, and had we not seen the nest and the egg-shells lying near we should probably have passed them by as they lay still on the grey lichen-covered rock.

At Pen-y-Parc there is a large colony of Herring-Gulls; Sheld-Ducks, too, nest there, as they do between the headland and Aberffraw, and on the northern shore of the Malldraeth Estuary. Several Cormorants and Shags were resting on a reef near the Point, but we saw no nests of the larger and only one of the smaller species. This nest was in a crevice splashed with much white excrement; the sitting bird, alarmed, left the nest and joined its mate, which was fishing at the foot of the cliff. A pair of Ravens nest here annually, but apparently with indifferent success; in 1901 Mr. Cummings saw the dead young ones—stoned from above—in the nest. The following year the nest, built in another site, contained newly-hatched young early in April. This year the nest was in the old site, but it had either been blown out or intentionally destroyed when Mr. Cummings saw it. In October, 1901, we saw a couple of Ravens flying along the cliffs near the South Stack. Mr. Cummings saw a Purple Sandpiper at close quarters on the rocks near Pen-y-Parc on March 18th, 1903 (Zool. 1903, p. 154).

We noticed a few Curlews in different places on the coast, and on June 10th a couple of Redshanks on the beach near Rhos Neigr, and three near Llangwyfan; but in the breeding season these two species, so abundant on the Anglesea coast at other times, are infrequent. On May 29th there were three Whimbrels on Penrhos Beach, near Holyhead, and on the same day we saw six feeding in a field of young corn near the mouth of the Alaw. One was calling at dusk near Rhos Neigr on June 9th, and we

saw a bird on the beach next morning. The flocks of Oystercatchers one sees in early June are probably non-breeders; there were fifteen together on the beach near Llanfwrog on the 2nd, and three days later seventeen at Rhos Neigr. Lapping had begun to pack by the 6th of June, though on the 7th we found newly-hatched young, and eggs on May 29th and June 8th.

We have not met with the Bar-tailed Godwit in spring, but on Oct. 9th, 1901, we watched two feeding with Curlews in Penrhos Bay. The Rev. M. C. H. Bird tells us that he has a female Black-tailed Godwit which was shot near Rhos Neigr at the end of May, 1886. At the end of September, 1904, Mr. Cummings met with the Grey Plover on Cymmeran beach, and again—a couple—at Porth Tre Castell. The Gannet is occasionally seen off the coast in the late summer; in July, 1884, and August, 1892, we saw twos in Cymmeran Bay.

Inland, western Anglesea is, like the north, for the most part treeless; many woodland birds are rare or absent. At Penrhos and at Carreg-lwyd, near Llanfaethlu, there are plantations, mostly wind-blown ash and sycamore, whilst at Treiowerth near Bodedern, and Llynon Hall near Llandeusan, there are woods and belts of timber. Some of the churchyards, and the larger farmhouses, such as Chwaen-wen, near Llantrisant, are surrounded by shade-trees, but generally speaking the country is bare. Rocky outcrops, gorse-covered wastes, bogs glorious with flowers in spring, and llyns save it, however, from monotony. Llewelyn's Wood, with its adjacent shrubberies and plantations overlooking the Malldraeth Estuary, can hardly be reckoned as Western Anglesea; this district reminds one more of the east side of the island.

Warblers are, naturally, scarce in this treeless country; Llewelyn's Wood was the only locality where we met with the Wood-Wren. We heard the Chiffchaff there, at Treiowerth and Carreg-lwyd. Even the Willow-Wren, except in the woods, is not common, though it is to be found wherever there are a few trees. A Garden Warbler in full song at Treiowerth was the only one we saw; we heard the Blackcap there, at Penrhos, and in many places in Llewelyn's Wood. The Goldcrest was noted in this wood, at Treiowerth and Llynon.

Less dependent upon trees, the Common Whitethroat is generally distributed and abundant, whilst the Sedge-Warbler is everywhere. The Lesser Whitethroat appears to be absent from Western Anglesea, but two were in song between Beaumaris and Penmon on the south-east coast on May 18th. The country seems to be admirably suited for the Grasshopper-Warbler, and, considering its abundance in the north and north-east, its scarcity in this district is remarkable; we heard one reeling on two occasions in a hedgerow at Rhos Neigr, and have met with the bird in former years in that district; elsewhere we sought for it in vain. The Tree-Pipit and Redstart, rare everywhere in the island, are apparently absent from the west, and we only met with the Tree-Creeper at Treiowerth.

The Blue Tit is not common; a pair of Great Tits were feeding newly-hatched young in a hole in a wall at Treiowerth, and we watched another pair collecting food near Llyn Coron. We did not meet with the Coal-Tit during the breeding season, but we saw some with Blue Tits and Goldcrests at Llynon in October, 1901. The Wren and Hedge-Sparrow are ubiquitous.

The Spotted Flycatcher is restricted to wooded localities; in these few places it is not uncommon. The same remark applies to the Green Woodpecker. The Greenfinch abounds, but the Chaffinch is not plentiful, even near and in the woods. We only saw the Bullfinch at Treiowerth and Llewelyn's Wood, but the Goldfinch is not uncommon wherever there are woods. The species affects the sycamores planted as shade-trees near farmhouses; we saw several at Penrhos, Treiowerth, Chwaen-wen, and in Llewelyn's Wood; and one on a piece of waste land close to Holyhead. One afternoon we saw more than a dozen old birds about the woods at Carreg-lwyd; while we were looking at some full-fledged young in a nest in a gorse-bush the old birds called incessantly from a sycamore hard by, at the same time jerking their rigid bodies from side to side as if they were fixed on pivots. We had come to the conclusion that the range of the Tree-Sparrow in Anglesea was limited to the neighbourhood of Penmon Priory, where there is a large colony, and it was a pleasant surprise to meet with the bird at Chwaen-wen, where several pairs nest in the old trees; we also saw two at Llynon Hall, and one in the churchyard at Llanfugail. The House-

Sparrow is everywhere, nesting in cliffs and hedgerow-thorns, as well as in more conventional situations. The Linnet and Yellow Bunting, as might be expected in a country where there is so much gorse, are common, and the Lesser Redpoll, though less plentiful than further east, is evenly distributed and far from rare.

Holyhead Mountain, the highest hill in Anglesea, rising to 720 ft., dominates the town. The higher part of the Mountain is a bare rocky waste where birds are little in evidence. Herring-Gulls drift across to their nests on the cliffs, or congregate to bathe in the shallow fresh-water pools which occur here and there; now and then one sees a beetle-hunting Kestrel poised against the sky, while a few Stonechats enliven the desolation of the upper slopes. The Stonechat is everywhere abundant in Anglesea, and especially so in the coastwise districts; in one small patch of gorse at Llanfwrog we saw seven cocks, four of them "chacking" from the tops of the bushes, within a space of a few yards. When one of the quarrelsome little birds intruded on another's territory there was a chase, the bright plumaged birds flashing amongst the golden gorse. The Stonechat's habit of feeding in reed-beds in autumn appears to be little known; in October, 1901, we saw several birds in the reeds at Llyn Maelog, clinging like Reed-Buntings to the stems, and a single bird was feeding in a bed of *Scirpus* at another lake. A week previously one of the writers had watched several feeding in the reeds at Crymlyn Bog near Swansea.

The lower slopes of Holyhead Mountain are devoid of trees; the rough pastures and fields under cultivation are divided from one another by walls of stone or turf; most of the ground, however, is furzy waste, beloved by Blackbirds and Hedge-Sparrows; indeed, we know of no locality where the Hedge-Sparrow is so abundant. In treeless Anglesea the telegraph-wires are constantly used by birds as vantage points from which to sing; the wires which cross the Mountain to the South Stack, as well as every prominent rock or stone, are requisitioned by the Song-Thrushes and Blackbirds.

The Nightjar is common on the Mountain, as everywhere on the wastes and rocky outcrops; sometimes it too will squat on the top of a telegraph-pole, and churr from this elevated position.

In Rhos Neigr village we saw one churring from the chimney-stack of a three-storey house.

The characteristic bird of Holyhead is undoubtedly the Corn-Bunting. Plentiful throughout Anglesea, its extreme abundance here has attracted the attention of many ornithologists. In May the persistent song, which has been likened to the jangling of a bunch of keys, may be heard even in the enclosures among the houses on the outskirts of the town itself. A little further afield the birds were singing everywhere, perched on telegraph and telephone wires, stone walls, or on the bare stems—chiefly brambles—which project above the turf walls. The sluggish birds continue to sing even when one has approached close to them, and then—often with dependent legs—fly slowly for a few yards to some similar perch, and sing again. The majority of the Corn-Buntings appear to leave Anglesea in autumn. In September, 1904, Mr. Cummings only met with two or three birds—one of which was singing—in Western Anglesea, and in October, 1901, we saw but few in this same district. Some few odd birds were in song so late as the 10th of the month, but others we met with were in small flocks.

A noticeable feature of Holyhead is the absence of Swifts, Swallows, and Martins. During the week we spent there we saw none in the town, though the Swallow is not uncommon in the surrounding country. The Swift, though not abundant, may be seen along the coast; we met with it at Bryngwran and other villages inland. The House-Martin is rare; three near Penrhos, one at Carreg-lwyd, and a pair which were nesting at Bodorgan Station were all we saw. The Sand-Martin is infrequent; a few nest in sand-banks in the warren at the mouth of the Alaw, and others in the mud-cliffs near Rhos Neigr and Aberffraw. On the evening of June 4th we saw a good many roosting with Swallows in the reed-beds at Llyn Maelog. Starlings, too, were roosting in the reeds on that date, and three days later we saw a large flock settle to roost in some low willows near Llangwyfan. Several Starlings were nesting in the hold of a stranded hulk in the straits near Valley.

We frequently saw Mistle-Thrushes feeding on and about the cliffs, and found a nest amongst sea-pink near Carmel Head; it was within reach from the beach. The Magpie is rare; we only

saw it near Llanynghenedl, at Llangwyfan, and near Carmel Head. In September, 1904, Mr. Cummings met with it near Llyn Traphwll, and on the bog below Llangwyfan-isaf. We again failed to find the Jay. The Cuckoo is fairly plentiful; one on June 3rd was already "changing tune." The Whinchat is rare; there were three or four pairs in the isolated part of the big bog Cors-y-bol, which is drained by a tributary of the Alaw, and a pair in a bog near Ty Croes Station. Mr. Cummings saw a pair on a bog near Holyhead in May, 1893. The Reed-Bunting is not uncommon in the bogs and round the llyns. The Ring-Dove is plentiful, but the Turtle-Dove apparently only occurs on migration; on May 8th, 1893, Dr. W. H. Dobie and Mr. Cummings saw two a mile or so to the south of Holyhead.

The Barn-Owl occurs sparingly; in July, 1884, we saw one in Llanfaelog village, and in 1886, and June, 1897, we several times disturbed one from its roost in the ivy at Tre Castell Bay. Some castings lay on the beach below the roost, and one of them contained the skull of a Dunlin. The examination of another batch of these pellets enabled us to add the Lesser Shrew to the Anglesea fauna (Zool. 1897, p. 327).

The White Wagtail occurs as a spring and autumn migrant; Dr. W. H. Dobie saw many between April 28th and May 2nd, 1894, in the neighbourhood of Rhos Neigr (Zool. 1894, p. 227), and Mr. Cummings has also seen them on this coast—near Porth Dafarch on May 13th, 1894, and near Porth Nobla on May 23rd, 1901.

It is unnecessary to more than mention such common species as the Rook, Robin, Meadow-Pipit, and Sky-Lark, but the Pied Wagtail, though frequently met with, is not so abundant as elsewhere in the island. The Grey Wagtail is absent from this part of Anglesea in the breeding season, but Mr. Cummings met with it at Caethle and Llangwyfan on Sept. 29th, 1904.

Western Anglesea lacks cover for Pheasants, but the bird is reared at Penrhos and elsewhere; a few wild birds are to be met with amongst the brambles which clothe the slopes above the cliffs in many places. The Partridge, on the other hand, is abundant. On the afternoon of June 5th—a hot day—we listened for some time to the liquid "whit, whit, whit" of a

Quail in a field of oats at Aberffraw. On the following morning, in the early hours, one was calling near Rhos Neigr, and later in the day we heard a third at Llanfaelog. After the 6th the weather was sunless and cold, and we heard no others; but Mr. F. Brownsword tells us that on June 24th he heard one calling near Llanerchymedd. The Land-Rail is abundant here as elsewhere in Anglesea, but perhaps not quite so plentiful as in the eastern portions. On Sept. 29th, 1904, Mr. Cummings flushed a Water-Rail from the edge of the Crugyll, and later found it crouching in a grass-grown ditch. Towards the end of October, 1904, a Spotted Crake was shot near Valley by a friend of Mr. Martin Wood, who saw the bird and told us of the occurrence.

The many lakes of Western Anglesea—some of them more than half a mile across—have an important bearing on the avifauna; Ducks of various species are more abundant in this part of the island than elsewhere. Some of these llyns are fringed with beds of reeds and a large *Scirpus*, and are more or less choked with aquatic vegetation. From the bare stony beds of others little islets rise, favourite resting places for Cormorants, which come to fish in the shallow waters. The Sandpiper nests on all the llyns; the Sky-Larks here reproduce the Sandpiper's notes in their songs, as those upon the sand-dunes introduce the call of the Ringed Plover. Near some of the lakes are extensive bogs, resplendent in early June with the yellow flowers of the iris. Snipe abound in such places—Common Snipe at all times, and Jack-Snipe in the autumn; Coots and Moorhens frequent the llyns. On one water we had between fifty and sixty Coots in sight at once, and we could not see the whole of the water, nor take into consideration the numbers which with their broods were concealed in the rushes. Where there are no reeds round the lakes the Coots make their nests—often in exposed situations—of the green *Scirpus* stems, on which the eggs are very conspicuous; the protective value of the clay colour spotted with black which assimilates so closely to dead fungus-speckled reeds is entirely lost.

Drake Mallards may be seen on all the lakes in spring in parties of two or three to upwards of a dozen, while in the rushes the ducks tend their broods. The Teal is plentiful in the

bogs ; we often met with small parties of three or four drakes, and from a swamp at Llechylched put up eight adult birds at once. The numbers of the resident birds are augmented in autumn ; hundreds resort to some of the lakes in September and October. The Shoveler is, like the Teal, more abundant in the west than elsewhere in Anglesea ; the strikingly coloured drakes often consort with drake Mallards, but sometimes are to be seen in little parties composed only of their own kind. We saw three and four Shovelers together in several places ; on one occasion six rose from a bog near Rhos Neigr, and on one of the lakes we saw a party of seven. Now and then we saw a duck and drake together, the eggs or young having probably been destroyed. The Mallard, though the commonest, is the shyest of the Ducks, a trait noticeable alike on the Cheshire meres in winter, and on the Anglesea llyns in the breeding season. When Shovelers and Mallards are together the latter will often take alarm and leave the Shovelers on the water, or if all rise the Mallards will leave the vicinity, while the Shovelers not infrequently return again to the water. When the Shoveler is swimming its characteristic pose, even if its broad shovel-shaped bill cannot be made out, enables one to pick it out from a party of Mallards. The head, carried low, appears to be weighed down by the heavy beak, and its somewhat squat body is, if we may use the term, down in the bows ; a duck or a drake in eclipse may be recognized by this pose. In several places we saw ducks which from their behaviour obviously had young broods. On June 6th we walked through a swamp at Llechylched, where the sluggish Crugyll is bordered by wet rush-grown land ; a narrow embankment raised three or four feet above the shallow water enabled us to see the birds which we might have missed had we been obliged to splash through the swamp itself. Six Shoveler drakes rose together, then a single drake, and later a duck and drake in company. Four ducks rose from the rushes, and squattered along the herbage and through the shallow water, two close together and two singly. Their actions were similar to those of a duck Mallard when surprised with a brood. The birds simulated disablement, flying with apparent difficulty, dragging their bodies through the water, and striking it with their wings. Unlike a Mallard, they made no sound, and as they went away from us showed little or

no white in their tails; the pale blue on the wing-coverts was, however, very conspicuous. We saw one brood of birds, perhaps ten days or a fortnight old, in a bed of *Equisetum*. The duck rose close to our feet, and squattered in full view across the water-crowfoot, which here, as it so frequently does in these slow-flowing streams, covered the water—a sheet of white.

On one of the lakes near Valley we saw a drake Pochard on the 3rd and 8th of June, and on the later date a female Tufted Duck on the same water. Both species probably nest sparingly in Western Anglesea—the Tufted Duck certainly does. During the third week of June, 1891, we constantly saw a drake Tufted with two drake Pochards on Llyn Maelog, where, on Aug. 1st, 1892, a drake Tufted was killed by flapper-shooters, and a brood of young in down, which were lurking in the reeds, were discovered by the beaters, and shown to one of the writers. In May and June, 1892, we saw Tufted Ducks on Llyn Penrhyn.

More Black-headed Gulls are to be seen feeding in the fields in Western Anglesea than in the north and east, and on an island, covered with rank grass and a few willow-bushes, on one of the lakes there is a fair-sized gullery—apparently the only one in Anglesea. We could hear the thin cries of an army of young birds on this island early in June, and estimated the number of adults about the place at five hundred; probably as many more were away feeding. In October we saw Common Gulls feeding in the fields with the resident species. On June 10th, 1897, we watched a Black Tern at Llyn Penrhyn (Zool. 1897, p. 329).

We met with Herons frequently in the bogs and about the lakes. At Treiowerth there is a heronry; from the high road we could see young birds standing in the nests in a belt of woodland, mostly spruce and ash.

The Dabchick breeds on all the lakes, but the Great Crested Grebe has, we fear, ceased to nest in Anglesea. Possibly old birds and helpless young have fallen victims to the unsportsman-like gunners who flock to Anglesea at the opening of the shooting season, and often fire without discrimination at any bird they see on the lakes. In 1892 three pairs nested in a reed-bed at Llyn Penrhyn; one nest contained five eggs—an unusual number. In May of the following year we saw a pair on Llyn

Penrhyn, and another on the adjacent Llyn Traphwll, but this year we searched these and other waters without seeing a single bird. In October, 1901, we saw a single adult on Llyn Hafodol, near Gwalchmai.

Though there are a few apparently suitable spots for the Dipper on the Cefni and other streams, we have not come across the bird until this year. On May 23rd one of the writers saw a pair on a little stream to the north of Beaumaris, and after a short search discovered the nest, containing young birds, beneath the beams of a wooden bridge. No other birds were seen on the brook. So far we have not found the Kingfisher in Anglesea in the nesting season, but the bird occurs on migration. On Oct. 6th, 1901, we saw one at a fountain in a garden near Holyhead Harbour, and on Sept. 29th, 1904, Mr. Cummings watched another on the coast between Rhos Neigr and Llangwyfan.

NOTES AND QUERIES.

MAMMALIA.

Carnivorous Propensity of the Badger.—On Sept. 28th a male Badger (*Meles taxus*), recently sent from Ireland and scarcely yet full-grown, escaped from the yard in which it had been placed, and killed a tame Raven (a very strong bird, but pinioned), a large hen Turkey, and two fowls, eating a considerable part of each of them, and apparently making some attempt to bury the remnants, as they had soil on them when found. Four young chickens were also missing, and these were laid to its charge as well. After this the Badger secreted himself for a short interval, but was presently heard of in a “rookery” wood at no great distance, where twenty-three fowls had been used by a gamekeeper for rearing Pheasants. Ten of these soon disappeared, and, as “cackling” was heard by a cottager living near on more than one night, there was little doubt that the Badger had been chasing them about the wood, but only one dead fowl was found. After this episode the animal probably went to sleep for a while in some hole, and, though suspected of purloining some vegetables, was not certainly heard of until the first week in November, when he was ascertained to have travelled some four miles. Here he crept into a chicken-house which stood by itself in a field, and in the space of about six days had despatched forty full-grown chickens. Of these the carcasses of thirty-six, or rather the scattered bits which remained of them, were subsequently counted by the owner. On Nov. 11th the Badger was found sleeping off the effects of this heavy meal in a corner of the chicken-house amid a pile of the feathers of the slain, and the next day was successfully snared. According to the best authorities, the ordinary diet of the Badger is roots and young Rabbits, and one would have thought there were plenty of both to be found in the county of Norfolk. J. H. GURNEY (Keswick Hall, Norwich).

Bat Swimming.—About midday on May 7th my son and younger daughter were watching the fish in a pond near this house, when a Great Bat suddenly dropped into the water about ten yards from the bank, and, to their surprise, swam to shore without the least difficulty. They described his movements as being very much like those of a Dog,

and said that he seemed to swim very high out of the water. Arrived at the bank, he shook himself, and made for the nearest tree, up which he climbed, and where I saw him some two hours later about twenty feet from the ground, apparently enjoying the warm sunshine, and none the worse for his adventure.—JULIAN G. TUCK (Tostock Rectory, Bury St. Edmunds, Suffolk).

AVES.

The Golden Oriole in Epping Forest.—On the morning of April 25th I was walking alone in Epping Forest, and when I had reached a point about midway between Chingford and High Beach a strange and brilliantly coloured bird sprang from the thicket near at hand, and flew at a good pace and on a low level for some fifty yards along the glade before me; it then alighted among the trees. I quickly recognized the stranger as a Golden Oriole (*Oriolus galbula*), and a few minutes later I had an opportunity of verifying my first observation, for in moving forward I put up the bird again. I then lost sight of it for the time being. On my return to the same locality about an hour later I again saw the Golden Oriole—no doubt the same individual as before—several times. Altogether I obtained five separate views of the specimen, although the first view gave me the best opportunity for observation. Once or twice I came upon it resting on the ground, as if in search of food, but on most occasions it alighted after flight upon the bushes or branches of the trees which abound in the vicinity. From the rich gold of the body-plumage—which was seen to advantage against the green turf and the thinly clad branches of the hornbeams—and the blackness of the wings, I conclude this to have been a male specimen. The black tail-feathers did not attract my notice. I have since made another visit to the locality in question, but without again seeing the subject of this note.—HERBERT CAMPION (33, Maude Terrace, Walthamstow).

Cuckoo at Portlaw, Co. Waterford.—A farmer near here, whom I know well, was witness, a few days since, to the Cuckoo's act of introducing its egg into a Titlark's nest. He has given me the following particulars, and I have seen the spot where the scene took place:—On May 23rd he was walking in one of his fields, and noticed a Cuckoo flying over a small clump of furze-bushes. It hovered round and round a particular spot, and then flew away a short distance. He then walked up, and found in the spot just beneath where the bird was circling a Titlark's nest with three eggs; then, hiding behind a fence quite near, he watched the Cuckoo, which returned in a few minutes.

It perched some few yards from the nest, laid its egg on the ground, and carried it in its bill to the Titlark's nest, and placed it therein. One of the three eggs in the nest he saw in its bill after it had left the nest, and this it left on the ground quite near; and when he went up to look at the nest after the bird had flown away he found the Titlark's egg broken in two, and the contents on the ground. The Cuckoo's egg, which is now in my collection, differs considerably in colour from those of its foster-parents. It is a good bit larger than the other eggs, but yet after all would hardly attract the notice of the real owner of the nest either from its size or colour. I have every confidence in the man who gave me the above information. He is a most reliable observer.—WILLIAM W. FLEMING (Coalfin, Portlaw, Co. Waterford).

The Sounds produced by the Long-eared Owl (*Asio otus*).—I fully agree with Mr. W. Gyngell, in his note under the above heading (*ante*, p. 183), that the Long-eared Owl is not so silent a bird as it is often alleged to be. Mr. Gyngell describes very accurately three sounds which it produces, and which are familiar to me; but my object in writing is to draw attention to what I consider the most characteristic sound of all—the nuptial note or “song” of the male—which, rather strangely, Mr. Gyngell does not seem to have heard. It is the more necessary to draw attention to this cry, as it is one which may very easily be confounded on paper, though quite unlike to the ear, with “Sound No. 1” of Mr. Gyngell's communication, which, I am confident, is, as he conjectures, produced by the female. The “song-note” is chiefly heard very early in the year—in Co. Wexford I am accustomed to hear it from the opening days of January to the beginning of April, but most persistently during February. It might be called a hoot, but does not, of course, bear the very faintest resemblance to the hoot of the English Tawny Owl. It is possibly the cry which Swaysland renders as “hoo-ok,” though that description may rather refer—as Mr. Gyngell assumes that it does—to the more moaning note of the female—Mr. Gyngell's “oo-woo.” Mr. Robert Warren has also described a “long drawn oo, oo, oo,” which is spoken of in the ‘Birds of Ireland’ (p. 116) as the seasonal call of the male, but of which the description appears to me even more applicable to the note of the female. In fact, it seems scarcely possible to tell from a description which note is intended unless both are described. I will now endeavour to set down what seem to me the readiest distinctions between these two cries:—(1) The male note has an abrupt ending (I should syllable it as “oop”). The female note dies off softly like a heavy sigh (“shoo-ogh”). (2) The “oop” is uttered at short regular intervals

—"oop, oop"—an "oop" every third second. The "shoo-oogh" comes at much longer and generally very irregular intervals—one bird which I attempted to time varied from nine seconds to twenty seconds in the length of her pauses, and this was in the height of the courtship season, when the Owls are most voiceful. (3) The "oop" can be plainly heard for half a mile. The "shoo-oogh," in the case of a strong-voiced individual, I have heard at three hundred yards—across an open field, not among trees—but one would generally need to be a good deal nearer than this to hear it. (4) The "oooping" bird, when it takes flight, immediately claps its wings, producing the resonant noise which Mr. Gyngell describes—I must confess that I had imagined the wings were clapped over the back, like those of the Nightjar and of the Wood-Pigeon, but I at once accept Mr. Gyngell's welcome observation that the contact is under the body—and it then flies about, repeating the claps at measured intervals, near the place where the female sits. The "shoo-ooghing" bird, on the contrary, flies from her tree in perfect silence. A curious property of the "oop" sound is that when heard quite close at hand it seems insignificant in volume, and one would never suspect its power to carry for anything like the distance to which it can really be heard. In the height of its season (*i. e.* the middle of February) it is begun each evening about half an hour after sunset, and can be heard—if several pairs are breeding in the vicinity—going on incessantly throughout the entire night.—C. B. MOFFAT (36, Hardwicke Street, Dublin).

UNDER the above heading, Mr. W. Gyngell writes (*ante*, p. 183) on the calls of the Long-eared Owl. However, I cannot agree with his description of the seasonal call of the male. Since January, 1864 (when I first became acquainted with the calls of the male) I have had ample opportunities of observing the birds, and listening to their calls, for several pairs breed every season in the trees of this place, breeding in the old nests of Magpies and Sparrowhawks, and but seldom in those of Rooks. Occasionally I have had the pleasure of listening to four or five birds in different parts of the place calling in rivalry to each other; when that is the case the calls are not so continuous, for the birds pause in their calls oftener to listen to their rivals.

Sound No. 1.—The call of the male is not a double syllable word, the call being merely the low-toned word of "oo," long drawn out, emitted at regular intervals of a few seconds, and may be kept up from ten minutes to half an hour or longer without ceasing if the bird is undisturbed. I have repeatedly listened to birds calling at the short distance of ten to fifteen yards, specially observing and listening for the

purpose of identifying and describing the calls, and I can most positively state that the calls of the birds of this neighbourhood are totally unlike the sounds of "roo-oo" or "whr-oo"; and I may remark that I have had an Owl calling for hours within ten yards of my bedroom window; so there was no possibility of mistaking the calls for anything but the usual long-drawn "oo, oo."

Sound No. 2.—This is the alarm-note and angry call of the female Owl when anyone approaches her young, even long after they have left the nest, and she flits about from tree to tree loudly "quarking" as long as the intruder remains near; and this "quarking" note of the mother frequently betrays the locality of the young birds when sitting on a branch unseen at first. No doubt but this cry may be also emitted by the male, and I have only once heard it in winter from a bird that had one evening just fled across the lawn. I have never heard it uttered by the young birds at any time, and if they were capable of or wished to utter this call I must have heard it from a clutch of four that were hatched and reared in a tree in our flower-garden not more than ten yards from my bedroom window. They were a great annoyance, for they kept up their plaintive cries for food from dusk to daylight, and on dark days often began their cries as early as twelve o'clock at noon. Also, for many years in succession, I have taken the young, and hand-reared them until fit to be sent to the Dublin Zoological Gardens, and never heard the "quarking" cry from them.

Sound No. 3.—This is caused by the bird flapping its wings (like a Dove or Pigeon) as it leaves its perch on the tree when disturbed in calling, or when flinging itself about on the wing as if in play, but, owing to the softness of the wing-feathers, the sound of the flapping is much lower and softer than that of a Dove.

My first acquaintance with the cry of this Owl thus occurred. About eight o'clock one bright moonlight night in January, 1864, I was surprised by one of our servants, in a most excited state, rushing into our sitting-room to say that some poor person was dying in the plantation near the cattle-sheds, for she heard their dying moans, and asking me to go and help the sufferer. Immediately on going out I heard the moaning, but, not thinking that any person in distress could be so close to the houses, I thought the moans might come from one of the cows drinking; but, entering the cow-shed, I found all quiet and safe, and on coming out again I heard the moans still continuing, and located them as proceeding from a tree on the edge of the little wood. As I cautiously approached a dark-coloured bird left the tree quietly, flapping its wings a few times, and disappeared in the shade. A few

minutes after the moans again began further off in the wood, but as I walked up to the place the sounds ceased, a bird flew off, giving a few flaps of its wings, as in the first instance, and then for over an hour the moans were resumed all round the place, but, although seeing the bird, I could not identify it, but came to the conclusion that from its mode of noiseless flight it was some species of Owl. For several evenings afterwards, while the moonlight lasted, I followed the bird (gun in hand), but, owing to it cunningly leaving the opposite side of the trees from me, I did not obtain the chance of a shot, and so the puzzle as to the species remained unsolved. However, a week or two later, as I was riding home from Ballina at nightfall, I heard the moans proceeding from a tree in a roadside plantation; so, stopping my horse, I listened to the sound, carefully watching the trees for some time, when, to my delight and satisfaction, I perceived a fine Long-eared Owl on a branch of a larch-tree in the very act of moaning. Then, a few evenings later, I saw another bird on a tree in the lawn, about twenty yards from the hall-door, where it remained for nearly half an hour moaning. The difficulty I had in identifying the bird (until I saw it in the act of moaning) was that in no ornithological work that I have had access to was any description given of the seasonal call of the male Long-eared Owl; neither in Thompson, Yarrell, Montagu, &c., is any mention of it. This silence is strange, for surely those who had heard the cry of the young must have more easily in the same woods heard the moans of the male. — ROBERT WARREN (Moy View, Ballina).

Position of Sitting Birds in Relation to the Wind. — Brooding birds face the wind when exposed thereto, and this may account for the changes in position assumed by the Hedge-Accentor observed by Mr. J. H. Gurney (*cf. ante*, p. 165). It was noted that the changes were in the same direction, *viz.* to the left, so that we may suppose they represented adjustments of position in relation to changes in the direction of the wind. Not only is a position facing the wind the most convenient for a sitting bird, but it also best enables it to hear, and perhaps scent, enemies. It would hardly be necessary, from the small number of eggs covered, and the compact form of the nest, for a Hedge-Accentor to turn from time to time in order “to distribute the warmth of her body more equally.” I may be allowed to congratulate Mr. Gurney upon his interesting observations. — W. RUSKIN BUTTERFIELD (4, Stanhope Place, St. Leonards-on-Sea).

Notes on the Ornithology of Richmond Park, Surrey. — I am able to add one species to the very remarkable lists of birds (*ante*, pp. 147

and 187) which have been published. I find a note of having seen a Jay (*Garrulus glandarius*) in the Park on April 2nd of this year.—HAROLD RUSSELL (16, Beaufort Gardens, S.W.).

Surrey Notes.—During May last I found three nests of the Song-Thrush (*Turdus musicus*) built right on the ground. Two of these were in woods, and sheltered by brambles and other plants. The third was in a field, and placed in a patch of long grass, in just such a situation as you would expect to find a Sky-Lark's nest. It is all the more remarkable that the bird should have selected such a site, as there were plenty of bushes and trees at no great distance in which it might have built. Although Song-Thrushes' nests may often be found on banks, I think the above instances of their building right on the level of the ground are somewhat exceptional. On April 9th last, when walking across Limpsfield Common near here, I saw three large Gulls flying in a northerly direction. They were at a considerable elevation, so that I was not able to make quite sure of the species, but thought they were Great Black-backed Gulls. A week later I saw another bird near the same place, and, as it was flying much lower than those I had seen previously, and came quite close to me, I was able to identify it as *Larus marinus*. On April 21st I again met with the bird at a large pond not far from Lingfield. On referring to Mr. Bucknill's 'Birds of Surrey,' I find that the bird occurs rarely on the Thames, and has on a few occasions been seen inland. These notes may therefore be of value to readers of 'The Zoologist' interested in the ornithology of the county.—CHAS. BENTHAM (Keymer, East Hill Road, Oxted).

THE ZOOLOGICAL SOCIETY'S GARDENS.

DURING the month of May the number of Chimpanzees exhibited in the Gardens amounted to eleven, a record for this or any other menagerie. One out of the three new examples recently added was from Uganda, and is peculiarly interesting on account of the decided rufous tinge pervading the tips of the hairs. From the same locality came a specimen of that rare red-crowned, white-bearded species of Guenon, described as *Cercopithecus neglectus*, which is one of the many forms of animals occurring both in Uganda and West Africa. It is generally associated systematically with the better-known Diana Guenons, of which two well-marked races inhabit West Africa, namely, the one with red thighs (*C. diana, sensu stricto*), and the one with white or lemon-yellow thighs (*C. diana roloway*). Two examples of the latter were presented during the month; as well as the second specimen we have received within the last twelve months of the rare Nigerian Green Guenon, *C. pousarguei*. From West Africa we have also acquired two pretty little Duikers, the crowned (*Cephalophus coronatus*) and Maxwell's (*C. maxwelli*). It is interesting to compare the difference in colour between these two, which are kept in the same enclosure; Maxwell's Duiker being of a rich slate-grey tint, and the crowned the ordinary tawny tint with black and white markings, so prevalent in Antelopes as a whole.

Probably the most attractive additions amongst the Mammalia are five Prairie Dogs or Prairie Marmots (*Cynomys ludovicianus*), sent by Mr. Hornaday, the Director of the New York Zoological Park. Apart from their quaint behaviour, these animals are interesting on account of their association in their natural haunts with a species of small Burrowing Owl (*Speotyto cunicularia*), a bird which takes possession of the burrows of other animals, sometimes of the Marmot, sometimes of the Ground Squirrel or Soudlik in North America, and sometimes of the Viscacha in South America. In the Gardens, the Prairie Dogs have been placed, with two of these Owls, in a sand-covered enclosure, where the two species may be seen living side by side.

For the last few years Sloths have been represented in the Gardens by an example of Hoffmann's two-toed species (*Choloepus hoffmanni*). Within the last few days, however, a specimen of the three-toed species (*Bradypus tridactylus*) has been purchased. Curiously enough, examples of this animal have never done well in Regent's Park, on account of the difficulty of getting them to feed. The one in question has, however, made a favourable start, and after being fed for a couple of days

by hand, has now learnt to help himself from a dish. It is a matter for congratulation to have specimens of the two known genera of this family of Edentates living together in the same cage.

To the collection of Storks have been added three Indian Tantalus, an African White-necked and a West African Marabou, which, with some White Storks, a Maguari Stork, a Jabiru, and two Adjutants, bring the species of this family now represented in the Gardens up to seven in number. Other rare birds are a female Nepalese Hornbill and two Sulphur-breasted Toucans (*Rhamphastus carinatus*). The latter species has not been exhibited in the Gardens for many years.

In the Insect House may be seen specimens of a handsome tropical Epeiroid Spider (*Argyope trifasciata*), brought with some Porto Santo Tarantulas (*Lycosa portosantana*) from Madeira by Mr. F. G. Aflalo. Two female specimens of the *Argyope* have spun their characteristic orbicular webs in the glass-cases in the house. On the outskirts of one hangs a diminutive male of this species, awaiting, it is to be feared, the fate that has already befallen two of his companions, namely, of falling a victim to the large and voracious female, which, like other members of this family, will devour the males, if she can catch them, as soon as the breeding season is over.

R. I. P.

NOTICES OF NEW BOOKS.

Mendelism. By R. C. PUNNETT. Cambridge: Macmillan & Bowes.

THIS little book refers to the evolutionary processes observable in organic nature, and enunciates a theory which is a clear challenge to what has been styled "the all-sufficiency of natural selection." It leaves "natural selection" as a giant factor in organic evolution, but not the sole one. It postulates the view that "the small fluctuating variations are not the material on which selection works." Bateson, ten years ago, drew attention to Discontinuity in variation as not being an unusual phenomenon. This consideration in the hands of De Vries produced the *Mutation* theory, and Mendel has demonstrated the fact that "the mutation when once it has arisen is not likely to be swamped by inbreeding with the normal form, provided that it is not injurious to the species."

But Mendel's contribution to the study of evolution is far from recent, and represents a piece of work—for it is based on actual experiment—that remained practically unknown for five-and-thirty years. It was given to the world six years subsequent to the publication of Darwin's great work on 'The Origin of Species,' and appeared as a paper in the Proceedings of the Natural History Society of Brünn, under the title "Experiments in Plant Hybridization."

Gregor Mendel, the future Abbot of Brünn, prepared this paper in the cloister, which reminds us of Borelli writing his 'De Motu Animalium' under somewhat similar circumstances. Mr. Punnett has given us some interesting traits in the life of Abbot Mendel. His thoughts had travelled far beyond the cloister; besides his experiments on plants he is known to have carried out others on bees, but of these no record apparently exists; he was a meteorologist, and also interested in sun-spots, while for a time he was "the manager of a bank." Mr. Punnett has produced a particularly concise statement of the experiments which have prompted the teachings of what is styled "Mendelism," and has contributed a valuable addition to our ever increasing evolutionary literature.

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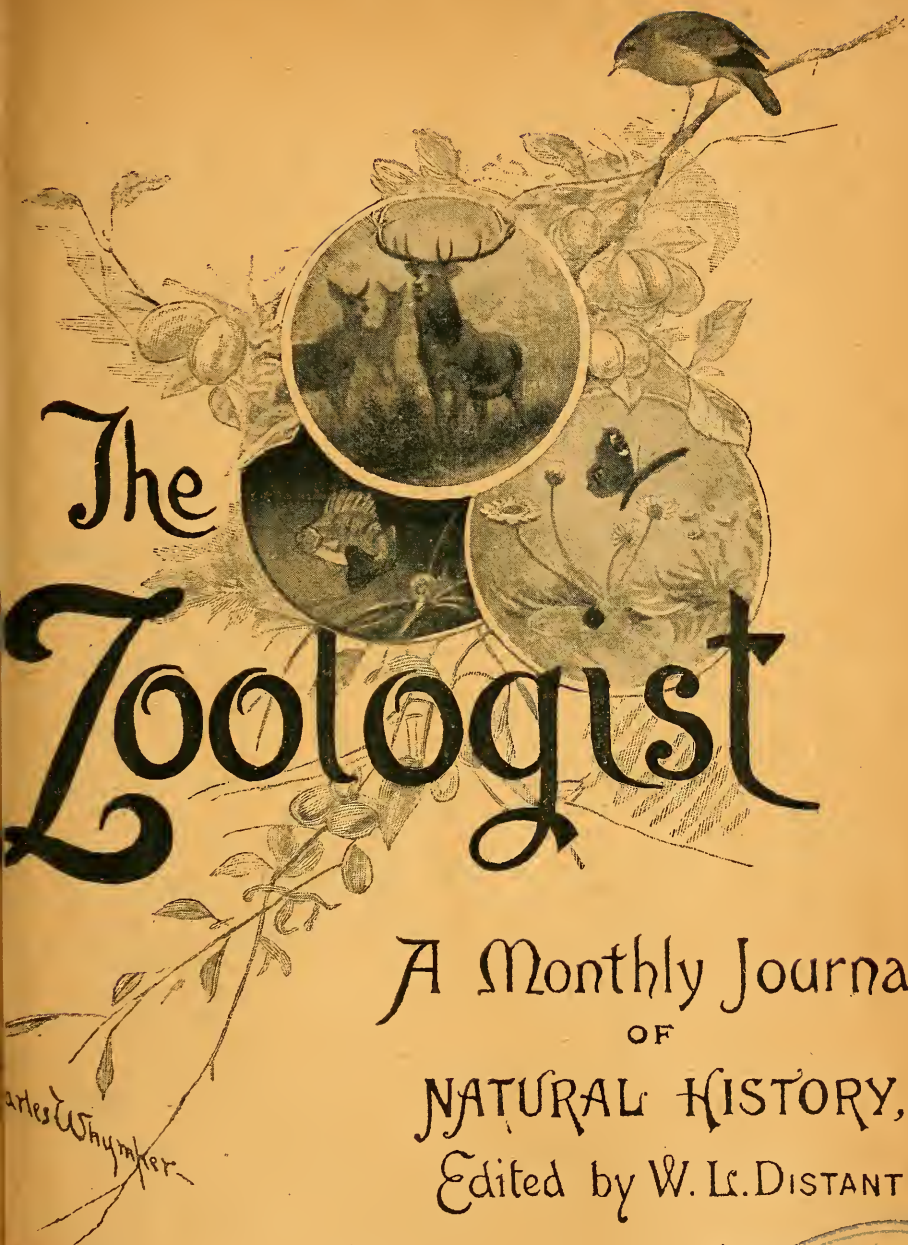
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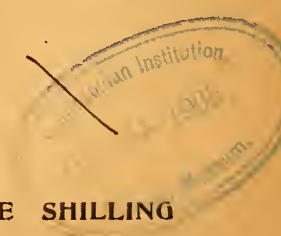
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THE ZOOLOGIST

No. 769.—*July, 1905.*

ON THE MIGRATION OF BIRDS.*

BY OTTO HERMAN, late M.P., Director of the Hungarian
Central Office of Ornithology, &c.

AT the moment of commencing my short lecture, I am under the impression of the surroundings, and of the occasion on which I have the privilege of speaking. Surroundings and occasion impose upon me duties I cannot afford to lose sight of. To speak on the migration of birds is an easy and, at the same time, a difficult task. Easy, if the phenomenon of migration is looked upon from the point of view of the impression it makes upon the mind of man; difficult, if we would do justice to the requirements of the subject as a scientific study.

It would be easy for me to draw a richly-coloured picture of the arrival of our pets in spring; to describe the feelings of the inhabitant of the temperate zone called forth by the sight of the first Swallow. The popular songs of all the nations of this zone teem with joy at the return of the songsters to wood and field; the poets, too—the noblest—are inspired thereby. Perhaps I might succeed in interlarding my description with oriental shades which might make a lasting impression on the practical sons of Albion, who take a lively interest in the enumeration of these facts.

* Address given at Fourth International Ornithological Congress, London, June, 1905.

The reverse of the vernal picture, and the feelings awakened by it, is found in the autumnal migration. The disappearance of our faithful house and garden friends, the sudden silence of wood and meadow, makes us sad, because it tells of evanescence, and heralds inclement weather, thus rendering our depression doubly acute. The autumnal migration leaves its impression on the mind of the people too, an impression sometimes so powerful that a great nation cannot shake off the shackles of regret. I need only refer to the German song of the Swallow, written by Herlossohn, and set to music by the classical composer Abt, familiar alike to cottage and palace, as a testimony of this general harmony of feeling. I might perhaps add some fresh tints, but my sense of duty forbids me to do so. The fact that I have to speak in the heart of England, on the occasion of a strictly scientific congress, is decisive.

The direction the thought of England requires me to take on this subject is an easy question to decide. England has given the world three stars of the highest order. The first was Bacon of Verulam, who advises us, in considering the phenomena of Nature, to adopt the method of experience, a course which amounts to the exclusion of speculation, and especially of fancy. The second was Isaac Newton, who by the law of gravitation has taught us the all-conquering power of the laws of nature, and has explained the equilibrium of the universe, thus putting exact science in the foreground. The third was Charles Darwin, who has conquered the rigidity of the conception of organisms, and has explained the idea of evolution. The example of these three great men must cause me, especially on English soil, to confine myself to facts, to the exclusion of sophistry, fancy, and belief in authority.

Before, however, I undertake the development of this theme, I must make the following remark. In spite of all Bacon, Newton, and Darwin did, in spite of the victorious advance of the exact and inductive branches of science, speculative theories held the day, even during the nineteenth century, in the consideration of the migration of birds, taken as a science. This is found even to-day in the nature of the phenomenon itself. The power of flight of birds, of nocturnal migration, and many other unknown circumstances led people to talk of "riddles," even of

“miracles.” They did not and still refuse to admit that it is our knowledge which is at fault, a position not conducive to experiment, leading to the declaration of judgments which are void of positive foundation, and of any actual inductive basis.

One of the most wonderful pictures of human intellect is displayed to our eyes when we learn that the great German Emperor Frederick II. (1194-1250), as “auceps,” *i. e.* fowler and falconer, was induced to have recourse to the method of experience, and to follow Bacon’s precepts long before Bacon lived, and that his views on the migration of birds were far better and more valid than those of many a famous author of the nineteenth century. The emperor knew that the birds pass from colder regions to warmer ones, and *vice versâ*; that not all birds are birds of passage; that some of them pass only from the mountains to the valleys, and *vice versâ*; that the movement is dependent upon temperature and food supply; that they meet before commencing migration; that land-birds move in a certain order, in two convergent lines—*e. g.* Cranes—even that the bird at the head of the flight has to accomplish the hardest work, and is therefore relieved;—all absolutely correct opinions. It is a thousand pities that the concluding part of the manuscript is lost, and that we are therefore not in a position to know where, in the opinion of the Emperor Frederick, the birds actually do pass; but the words “warmer regions” are sufficient to prove that the emperor had no “riddles,” but only *natural* things in mind.

But as in other fields, this period is followed by a time of decadence, a natural consequence of departing from immediate experience: the characteristic of this age of decadence is speculation, which sought contributions from old authorities, and the axioms established by them.

Then arose the so-called immersion theory, with all its appurtenances; the belief that the birds of passage do not leave us at all, but spend the winter sleeping either at the bottom of some water or in caverns or hollow trees. Even serious natural scientists of the eighteenth century, as Geoffroy de St. Hilaire (1772), still believed in winter sleep, and, indeed, pretends to have seen with his own eyes sleeping Swallows, certainly Bats. Your great countryman, E. Jenner, the benefactor of

mankind, had to protest against this, as he did in 1824; yet the misbelief has nevertheless prevailed in more or less obscure writings until the present day.

Even in the high-class works of famous authors of our own time echoes of this mediæval belief in miracles are still discernible: mention is made of the gift of presentiment, of miraculousness, of puzzles which, if reduced to Bacon's terminology, are nothing but "want of inductive knowledge, and of positive notion resulting therefrom."

It would require the foresight and patience of a Theseus to unravel the labyrinth of peasants' maxims dealing with the world of birds and the foretelling of the weather.

Taken as a whole, the science did not get much farther than an amassing of arrival- and departure-data, which finally formed a chaos that daunted and still daunts the boldest authors. Most of them preferred to take the thing at the easy end: to draw far-going conclusions from a few data, to exert their ingenuity, sometimes only their fancy. This state of things naturally resulted in many singular contradictions, of which I would like, with your kind permission, to mention a few:—

Naumann.—There are definite routes of migration.

Homeyer.—There are no routes of migration.

Weismann.—The birds learn how to migrate.

Gaetke.—The birds act by instinct.

Palmén.—Orientation is a traditional gift.

Weismann.—Orientation is congenital.

Gaetke.—There is no leadership.

Weismann.—There is leadership.

Wallace.—The weather has no essential influence.

Homeyer.—The weather has an essential influence.

Naumann.—Temperature plays a very important part.

Angot.—Temperature is not an incentive.

Lucanus.—The flight takes place at a height of 3000 ft.

Gaetke.—The flight goes on at a height sometimes of 35,000 ft.

Braun.—The original home of the birds is the tropics.

Deichler.—The original home is not the tropics, &c.

The prevalence of the speculative tendency in endeavouring to explain the movement led many authors to assume migration routes, and to schematize them, even before they were corroborated, on maps. If we draw the most important of these migration routes on a map of the eastern section of the northern hemisphere, an entanglement of lines is obtained; if all the routes indicated by the authors are entered, we get a Gordian knot. We are overcome by the feeling that it is impossible for the birds to pass along these routes. Some ornitho-chartographers, instead of migration routes, draw, so to say, only stupendously bold lines over points where no human being has ever set his foot, still less birds under observation!

I do not want to enter here into a critical discussion of the subject. I take the facts—*they exist*, and authorize us to continue our investigations on the basis of facts, therefore in an inductive way; and, in order to do this, we must proceed in a strictly methodical manner.

I shall now, in brief outlines, elucidate the principles of the method. The migration of birds is a phenomenon of movement which leads from one zone to the other, and *vice versâ*. It follows therefrom that *space* and *time* are the basis of the phenomenon, and that the question cannot be solved from the phenomena of *one* locality or point only, even if this be a whole country. The solution is possible only if we elucidate the phenomenon in its *whole* course, or, to express it concisely, if we endeavour to grasp and clear it up.

From the nature of the subject it follows that the task can only be accomplished by a *division of labour*, which ought to be evenly divided as far as possible over the whole area. The migration of birds corresponds in the main with the seasons of the year, and is thus, as a phenomenon, connected with the subject we call meteorology. Meteorology owes its great success to the network-like division of its areas, to the uniformity of observation, and of working out of the data. The migration of birds, as “ornitho-phaenology,” ought to be treated exactly in the same way, *viz.* in organical connection with meteorology.

The short space of time at my disposal prevents me from entering on a detailed exposition of the method. I shall therefore only touch on the essential points. We must work out the

myriad data recorded in literature methodically according to space and time, and draw from the average figures thus obtained the conclusions relating to the progress of migration; so much for the past. The new observations must be carried out at all points uniformly, and continued, year after year, according to the same even method.

But, you will ask me whether I am able to point to the tangibility of the method? I answer, in the case of our Hungarian method, certainly, and I shall restrict myself to the Swallow; the question is now, what do we know of the spring migration of the Chimney-Swallow in Hungary?

In 1898 more than five thousand nine hundred masters of elementary schools, and others also, decided to observe the arrival of the Chimney-Swallow, and to report the results of their observations to the H. C. O. These observers, more than six thousand in number, covered the area of Hungary very well. They sent in their data on special post-cards; the points of observation were geographically determined, and then each day separately schematized on particular maps. In such a way we obtained fifty-four day-maps, each with as many dots as there were points of observation. The result was:—Beginning of the migration, March 10th, 3 points; culmination, March 30th, 343 points; end, May 2nd, 15 points. Hereby the series increases until March 30th, when it culminates, and then it decreases. We see furthermore that the arrivals fluctuated according to the state of the weather; that the settling of the alpine region began only at the end of April; that the plain, the hilly portion (Transdanubian district), and the Transylvanian plateau differ with respect to the time of migration; and that therefore Hungary may be divided into *four* migration areas. Furthermore, it was remarked that the settling did not take place on narrow routes of migration, also not in a broad front, but that it resembled the *scattering* of the seed by the sower, where many a seed might be flung this side of or beyond the place for which it was intended. It was, moreover, proved that the mean day of arrival in Hungary for the year 1898 was April 8th, since rectified, on the basis of more than ten thousand data, to April 7th. From these series followed the settling maps, which show that the Swallow settles in Hungary in

spring, coming from S. ; the White Stork from S.E. to N.W. ; the Wagtail from W. to E. ; the Woodcock from S.W. to N.E. ; the Cuckoo from S.E. to N.W., &c. All positive facts which it would not have been possible to establish by the old method.

And, if you ask me what else we have determined by our method, I reply : We know that the Swallow settles in the areas of Europe, from Gibraltar to Luleå, in one hundred and five days ; that the young Swallows are already fledged in Gibraltar when the old ones for Luleå only arrive ; that the settling of Hungary may last as long as seventy days ; that the Swallow remains here on an average one hundred and sixty-seven days. This must be sufficient. If I were to enumerate all the facts brought to light by the inductive method, I should be obliged to put your patience to a severe test, but the result would only be to show that Hungary is the best observed and best worked-out country. The whole work is still only a local one, even if taken in the widest sense of the word. We Hungarians only work now with three hundred thousand critically determined data. This is much, and still little, if we take the areas still absolutely unknown, or of which we barely possess any data.

For the working out of the migration of the Cuckoo we have hitherto collected from the whole area of distribution thirty thousand positive data, but we are still without those of the Iberian peninsula, the entire Balkan, and the larger part of Italy. From England, on the contrary, we possess the most marvellous series concerning the appearance of this bird. It was placed at our disposal by Mr. Thomas Southwell, of Norwich, and comes from the Marsham family in Stratton Strawless, who have kept a faithful record of the arrival of the Cuckoo, with a few intermissions, from 1739 to 1904—a fact which does unspeakable credit to the many generations who have continued the work. When, however, all regions are as well explored and as well known as possible—at least, as well as Hungary is—and not till then will the true nature of the phenomenon of migration be revealed to us. But, people will say, it is an enormous, a Herculean, task to make millions of observations, and to work them out methodically. That is true enough. But I ask, which of the tasks the human intellect has accomplished in the interests of its own enlightenment has been easy? Not one! The road

to success is a true Calvary. It is our evident duty to carry out the work of "ornitho-phaenological" observation. In this task I count, in the first place, on the ornithologists of England, the heirs of Derham, a man who, as far back as two centuries ago, busied himself with the science of observation. What is required of us is to throw into the balance a sense of duty, courage, and unbending resolution.

Before closing, however, I must take into account the realistic tendency of the time. We often hear the question asked, what can a knowledge of the migration of birds profit us? The profit is a twofold one :

1. The solution of the problem is in the interest of science, therefore of intellectual progress ; consequently the highest profit of mankind.

2. Only the solution of the problem can give us a correct notion of the great part that birds of migration play in the household of nature.

The millions of birds which, season after season, wander from one zone to the other represent an enormous aggregate of labour ; and this not only by their flight itself, but by their search for food. This labour and the search for food act in the organic life of nature as does the regulator of a steam-engine, at one time accelerating, at another retarding. By migration this labour is transferred from one zone to the other ; it is indispensable, and can only be performed by the birds, whose bodily structure corresponds in many respects to peculiar tools.

A full insight into the essence of the work done by birds will give us a correct notion of their usefulness or injuriousness to man, and lead us to rational action for their protection. A clear conception of the masses of birds in question may be gathered from an inspection of the hecatombs of winged creatures which year by year during migration shatter their heads in contact with lighthouses.

I thank you, gentlemen, for the patience and indulgence with which you have listened to my remarks.

MENAGERIE MEDICINES.

BY W. B. ROBERTSON.

IN olden times, before scientific deduction and a knowledge of chemistry had taken the guiding-reins in the practice of medicine, the cures practised, even by command of the then highest medical authorities, were, if viewed through the eyes of our latter-day knowledge, marvellous to the verge of unbelief. The art of printing has preserved to us records of the remedial agents of two and three centuries ago, and a cursory study of these records yields many interesting instances of the crudity of the medical science then in vogue.

Wild animals were cut apart, and each separate organ was supposed to have a potency, usually bearing some relation to the nature of the animal in life. In this respect the medical beliefs of former centuries had a striking resemblance to the superstitions which hold sway among some native tribes where various wild animals have their homes to-day.

The Lion took his place at the head of the list of animals whose parts were held to be efficacious in the conquering of diseases. His heart, dried and reduced to powder, was looked upon as a specific for epilepsy; his fat was good for all affections of the nerves and for deafness; his flesh lent increased strength to the brain; his blood, treated in the same manner as his heart, was an antidote for poisoning, and even his bones in dry powder were used to allay fevers. The Elephant seems to have been required for his tusks only. Grated ivory was administered to fortify the heart, to resist poison, and was also made into a decoction with the same intent.

The equipment of the Hippopotamus most valued was his teeth. Powder of Hippo teeth was sometimes given to arrest internal bleeding. The Camel was almost as useful as the Lion in regard to the different parts of his anatomy which he was compelled to yield to the service of medicine. It is stated that

nearly all his organs contained "valuable oils and volatile salts." His gall mixed with honey was a confection given to invalids of the middle ages, and his blood, fat, flesh, and brain had each its niche as a curative. Of the Giraffe, the only parts which old-time apothecaries seem to have commandeered were his horns and nails for epilepsy. For the same disease the Wolf was called upon to yield his heart, for pulmonary disorders his lungs, his intestines for stomach troubles, and his teeth to assist the teething of children.

In the list of smaller game, the Hare had first place. The hair of this animal was applied to wounds to arrest bleeding, and the blood, heart, and lungs were given for dysentery. The blood of a newly-killed Hare had merit in skin diseases.

But no living creature large or small was favoured as was the Viper. Belief in the potency of all parts of the Viper was strong and universal throughout Europe for many centuries. Much literature describing its use in medicine is open to the student. The instructions given by one old authority regarding the procuring of Vipers are these:—"One should seek Vipers in spring or autumn, because then they are fatter and stronger than they are at other times. The volatile salts of Vipers are preferable to those of all other animals, because they are more subtilè."

Vipers were given in many forms, including essence, tincture, oil, salts, and powder. The powder—that is, the flesh dried and triturated—was considered by some old writers as much inferior to the other preparations, in the belief that the drying dispelled much of the strength. Some practitioners went so far as to insist that the deaths of the animals caused a similar deterioration, and insisted that they should be put into the retort or the decoction-pot while still alive. A bread of Vipers was even made. Powder of Vipers' flesh was introduced into cakes with sarsaparilla, yolk of egg, yeast, flour, and milk; and one may read that this, eaten regularly, cured leprosy. Vipers generally were held to be victorious over nearly every disease of which therapeutics had cognizance, and to yield concentrations little less potent for good than the elusive elixir of life of ancient alchemy.

Serpents of all sorts took a place below Vipers, yet were held in high regard. The skin which the Serpent discards each

summer was made into an infusion, and was given for disorders of the ears, teeth, and eyes.

The discovery of the New World opened in its flora and fauna too valuable a field to be neglected in the search for new remedies, and the animals which soon became accepted in medicine were the Beaver, the Buffalo, and the Armadillo. "Castorem" was an extensively used drug two centuries ago. It was made from the Beaver, and given for nervous disorders, and even for measles and small-pox. Buffalo horn was an esteemed sudorific. The bone in the tail of the Armadillo was broken into very small pieces, which were put into the ears to cure humming in these organs and deafness. We find a warning not to use more than one piece at a time.

The roasted heart of a Monkey was believed to sharpen the memory. Stones said to exist in the head or stomach of a Porcupine were believed to chase away "bad humours" by causing perspiration. The claws of the Lynx, worn as an amulet, were good for the nerves. The flesh of the Chameleon was held remedial in cases of gout and rheumatism, and the dried blood of the Tortoise was given for epilepsy. The list might be extended down the whole catalogue of animal life as it was known at the time of which we write.

If the domestic animals were not held in higher esteem than those which required to be hunted, the methods of preparing them or employing them in medicine were often more repulsive. For instance, we read that for pains in the side a living Cat opened and applied thereto performed a cure. Not quite so disastrous for the Cat, but perhaps more dangerous for the patient, was a remedy recommended for whitlow, a trifling but painful growth under the finger-nail. One was advised to put the finger into the ear of a living Cat several times a day for fifteen minutes each time. The Dog was often treated as unceremoniously as the Cat. For certain brain diseases a newly-born Dog was cut open and applied to the head as a cap. The fat of a Dog was considered to make a good ointment, and was frequently used as a base. It was applied for deafness, and given internally for consumption. The inwards of the Horse appear to have been neglected by ancient medical practices, but the excrescences which appear upon the legs of Horses were, if

cut in spring-time and grated to powder, taken for epilepsy. Attempts were made to cure the same malady by internal doses of the horn and hoof of the Ox, the parts of which were believed to possess virtue as curatives. The bones, particularly the bones of the legs, were introduced into plasters. The stomach of the Ox sometimes contains a ball formed by the accumulation of hairs which have been swallowed through a course of years, and this was both used as we use a sponge and was given as an internal medicine to arrest bleeding. The service rendered in medicine by the Cow was similar to that exacted from the Ox, and in addition the udders were considered a good pectoral remedy when made into broth. The Pig and the Ass also contributed to the curious remedies of our forefathers, but sufficient has been written to show how absurdity reigned, and to secure appreciation of the progress made since the days when medicine scarcely deserved to rank among the sciences.

THE FAUNA OF THE "CEDARS," LEE, KENT.

BY JOSEPH F. GREEN.

IN an Ordnance map dated 1800 this place is shown as so many fields, partitioned out by small elms, and, although these elms are now gigantic, the old arrangement is still visible. The cedar trees are *far, far* older, being probably contemporary with their neighbours, the famous Spanish chestnuts of Greenwich Park, planted by the children of James the First. For some thirty years I have resided more or less continuously in these grounds, a suburban oasis of some forty acres, belonging to Mrs. Penn; so artificially laid out, that several generations have learnt to excel at our national games, and yet sufficiently wild and wooded to attract and protect a fair representation of the animal life that haunts our great metropolis; so close to London, that on an extra still night you may catch a weird echo of sonorous Big Ben, and yet so far afield that you may perhaps at the same time be charmed by the loud clear notes of a Nightingale, or be startled by the harsh scream of an Owl. Here, as elsewhere, it has ever been my delight to make notes on all matters appertaining to natural history, which enables me now to give a short account of my personal experience of the "Cedars" fauna.

Our wild mammals are few, although we have our share of Rabbits, Rats, Voles, Field-Mice, and Mice (domestic). Hedgehogs, owing to their nocturnal and retiring habits, are not often visible, but our night watchman occasionally sees them, and I remember a couple that were hybernating in a sort of nest just under the ground. The Dogs had scratched them up, but we called them off, re-covered the little prickly animals, and all was well.

In 1903 I contributed a paper to the West Kent Natural History Society on the birds of the "Cedars," and have only one addition to make—a Wheatear, that strutted about on our West Lodge lawns, May 2nd, 1904, and then *flew up into*

a tree; unusual for a bird so associated with barren heaths and Rabbit-warrens. The number of wild species I have myself identified in the grounds is seventy-two, but several of these are solitary instances, such as Pied Flycatcher, Peregrine Falcon, Turtle-Dove, Woodcock, Cormorant, Ring-Ouzel, Wheatear, and Red-backed Shrike. The *rookery* here is a very ancient affair. The Rooks commence to repair their nests in February, which through the winter months have been used by Tits and other small birds to roost in. I could relate plenty of stories about their peculiarities, but will confine myself to two. In February, 1901, we started hockey for the first time on the cricket-ground. The large elms overshadowing the ground contained the usual Rooks' nests; but the busy occupants failed to appreciate this innovation, and moved all their nests bodily across the railway to the other side of the grounds. The Rooks (with other birds) are fed every morning on the "Cedars" lawn. One Sunday this was forgotten, and I saw a small detachment of the boldest spirits march up to the drawing-room window and commence tapping. A sort of gentle reminder! With them I often see, and still oftener hear, a pair of Carrion-Crows.

A Ring-Ouzel was picked up by my youngest daughter in the camellia-house, half-choked by a berry. This was extracted, and the bird lived some time in a Pheasant aviary, but finally died in a fit. It was no doubt attracted by the "Cedars" grounds on its autumn migration. A Hawfinch I picked up dead on a West Lodge* path; these birds visit us every March, and feed on the holly-berries, but I have never noticed their nest. There is occasionally a stray Pheasant or two on the grounds, and last year a Partridge hatched off her clutch and reared the brood, notwithstanding the assiduous attentions of a Kestrel-Hawk, that fortunately gave itself away by screaming.

The Owls are a great institution here, and I love to hear them. In June and July the young Brown Owls seem to call for food all night—a quick "too-whit." The old birds give a very loud drawn-out whistle, on a descending scale, followed by the same note in tremolo, like a child in distress; our watchman sometimes sees them dive into the ivy after the roosting Sparrows, which swarm here. I have often counted over one hundred and fifty on a fence by the West Lodge field. The Barn-Owls love

* A house built inside the grounds.

to sit at night, in a friendly way, by the West Lodge Pigeons, looking, no doubt, for Mice.

Sparrows, Starlings, and Wood-Pigeons are increasing here (and I think everywhere else) enormously. The Wild Geese (*A. albifrons*), which are not pinioned, nest at the pond regularly; they eat nothing but weeds and grass; they are sometimes accompanied by a Heron. I hang pierced cocoa-nuts out for the Tits; and the Great Tit, Blue Tit, and Coal-Tit seem to prefer this to any other food. The Great Tit, I am glad to say, can hold its own against any number of Sparrows. Nightingales seems to have left us, but, as they have returned to "Brooklands," close by, they may perhaps favour us again. The Cuckoo still remains faithful, though every spring we hear less of its welcome note, owing, no doubt, to so many properties around being amassed for building purposes. For years I have been trying to get a clutch of Hedge-Sparrow's containing a blue Cuckoo's egg; and last year I succeeded. It is curious why a Cuckoo's egg in Redstart's is nearly always blue, and yet hardly ever blue in the Hedge-Sparrow's, although Redstarts' and Hedge-Sparrows' eggs are almost identical.

It is much more difficult to give an even fairly accurate list of Lepidoptera, especially the night-flying and sober-coloured moths. Still, by regular sugaring, using a moth-trap, and taking advantage of nature's sweets, I have been able to catalogue the imagines of fourteen butterflies and ninety-three moths. The butterflies are all of the commonest (but I live in hopes of one day seeing *antiopa* on the over-night's sugar, as I did at Bifrons last autumn). Our earliest, not counting hibernating species, is the pretty little "azure blue" that appears in some numbers every April (attracted, no doubt, by the fine old West Lodge hollies). Of moths, the handsome *Plusia moneta* (it is still without an English name), that suddenly invaded our shores, is very common, and very conspicuous as a larva on our larkspurs, and is very easily reared. The hawk-moths (lime and poplar) are numerous as larva, pupa, and imago. A light variety of *populi* is common and very handsome, and the little Humming-bird Moth occasionally visits our pink geraniums. The *Noctue*, of course, are more easily attainable, owing to sugar; and I find methylated spirit the best draw. It is a pretty sight to watch

by lantern light the great Red-underwings thrusting their long probosces into the sugar, with their sparkling eyes and quivering scarlet under wings. But still more enthralling is it to find, as I did at Benacre, on the 24th of August, 1901, a "Clifden non-pareil" amongst them.

On the 31st of July, 1888, the day after the great storm, one end of the "Cedars" pond resembled a small waterfall. Numbers of Eels were washed ashore, and amongst them one four feet long, eleven inches round, and seven pounds in weight. A still more extraordinary take, in the same water, was a Rudd that weighed four pounds four ounces. I caught it myself in July, 1874, with paste soaked in honey, during a sharp thunder-



RINGED SNAKE (*Tropidonotus natrix*).

storm ; and also at the same time two Carp, five pounds each. This pond contains Carp, Bream, Perch, Roach, Rudd, Dace, and Eels. I remember once catching in this pond a two-pound Perch, which I had stuffed, but now cannot find. The history of this piece of water is obscure, and its volume inconstant. A few years ago it rapidly diminished, without our discovering the reason ; so much so, that we offered the great Carp to the "Zoo." Luckily they declined them, for the water all came back, and is now higher than ever. Kingfishers and Moorhens have nested on the banks as long as I can remember, and Wild Duck, Herons, and Sandpipers pay occasional visits. An uncle

of mine was exceedingly fond of fishing in this pond, and was there nearly every day. Once, while fishing from the bridge, he struck, as he thought, a fine Carp, which, on reeling in, was found to be a Tortoise. It had to be landed somehow to get the hook out, and to do this it had to be hauled up to the bridge. My uncle was a sensitively humane man, and when it was up his troubles were far from over, as it kept drawing in its head, hook, line, and all. He finally returned the creature to the water, put up his things, and never fished there again.

A few days ago one of the gardeners killed a Ringed Snake, two feet six inches long. As these Snakes live mainly on Frogs, it had probably only recently left the water; so I suppose it is right to class it as another denizen of the "Cedars" ponds. This is the first true Snake I have seen here, but I have several times noticed a Slowworm basking in the sun.

AMONG NORFOLK TERNS.

BY A. H. PATTERSON.

ON Whit-Monday, June 12th, of the present year, I paid a flying visit to the quaint old town of Wells, and, in company with Dr. S. H. Long, of Norwich, spent a couple of hours exploring the marshes reaching immediately from the town-front to the seashore. The tide was out, leaving exposed, in the bed of the creek that passes for a river, patches of Mussel-covered mud; these molluscs had been spread there to fatten—or sicken—in what must be, even on the flood-tide, sewage-tainted water, a subject for the local authorities. I should personally much prefer the clean-fed “Stukeys” from Stiffkey, a few miles eastward out there on the seashore. A single Common Tern was hungrily eyeing the rather turbid bit of water a few yards above the surface, making more pretence at than really fishing.

The tramp and scramble and leaping across the rough marsh-land, intersected by numerous sharply-cut creeks that wound round about in every direction, and traversed by well-worn trails leading seawards, was made interesting by reason of meeting with unfamiliar forms of plant-life, which, with the exception of the Michaelmas-daisy (*Aster tripolium*), the jointed glasswort, and the aromatic sea-southernwood, were altogether different from those of my own neighbourhood. The thrift was conspicuously sprinkled around, with tufts and clumps of the shrub-like *Suaeda fruticosa* in equal abundance. The creeks and “pulk-holes” gave evidence of a varied fauna and invite research.

A pair of Redshanks had much to say against our intrusion; they evidently had a nest somewhere in one of the higher tussocky corners, which would be awkwardly placed, however tempting the area generally, unless beyond the reach of the tidal water, which on the spring tides, I am assured, places the whole marsh under water. I thought it rather odd that there should be

here a three hours' flood and a nine hours' ebb, and, stranger still, that a twelve- and fourteen-foot rise is a usual thing, seeing that at Yarmouth, not so far away, a six-foot tide is esteemed a good one! A couple of Sheld-Ducks most picturesquely broke the middle distance with a dash of conspicuous colouring, but they were exceedingly shy, and quickly took to wing.

The locality chosen by the Terns for their nesting quarters is barely above the common level, and the sea-water, lifting above the creeks, must on unusually high tides trickle into the depressions here and there. These cover an acre or two—perhaps more, and are within a stone's throw of the sea, from which they are separated by a ridge of low hummocky sand-dunes hardly deserving the name of sand-hills. These shut off the highest wave-sweeps of the far-travelling sea that at low water is a good mile away. The usual high-water limit, distinguished by a long thick rim of Cockle-shells, numbered by myriads, and empty valves of *Solen ensis*, and which I had but a few moments for inspecting, gave promise of many an hour's remunerative overhauling to anyone sufficiently interested. And, *mirabile visu!* nest after nest of Common Terns dotted the inside edge of this ridge of jetsam and flotsam a span or two only from the tide-limit; the spume of the waves must have blown at times upon them. On asking the keeper what about a higher tide than usual, Tom Cringle only suggestively shook his head. On referring to the all too meagre report for 1904 of the Wells Wild Bird Protection Society, I find a suggestion of danger: "There were neither heavy gales nor high tides to harm the nests, and by poisoning the Rats early in the season the young birds were saved from their depredations."

The larger area referred to is a wide-spreading shingly level, interspersed by patches of sparse verdant dune-herbage. The Terns—the Common (*Sterna fluviatilis*) and the Little (*S. minuta*)—had much to say by way of protest, and flew screaming around—the Little "Chit-pearl" as vociferous as its larger relative—in excited hundreds, like so many whirling snow-flakes, keeping up their objection so long as we kept upon the move. The nests in many places were but a yard apart; a triangular stride would cover three of them. I was struck by the marvellous correspondence in colour of the eggs to their surroundings; those

deposited among the rufous-tinted shingle were of a russet-colour. The ground here was as smooth almost as if it had been rolled ; indeed, the levelled stones gave one the impression of a rude attempt at tessellated pavement. Among the blue-grey patches of pebbles the predominating tints were greyish, and on the greener portions they most assimilatively assumed that coloration. In some instances, however, protective colouring was a negative quality, and conspicuously contrasted eggs quickly caught the eye. Dr. Long pointed out one egg, on a dark ground, of a vivid bluish green, and some nests contained three differently coloured eggs. Every egg was blotched more or less with bluish ash and dark brown.

The eggs of the Common Tern were easily distinguished from those of its *confrère* by their larger size. In almost every instance three eggs were laid, and most were hard-set ; I obtained an addled one of each species, and understood that one clutch of young birds had already forsaken their nest. We looked in vain, however, for any of them in the adjacent marrams ; they appear to be as capable of concealment as the little ones of the Ringed Plover. Extreme vigilance was necessary to avoid trampling on nests, but we soon learned to "spot" them, thanks to Tom Cringle's "trade mark" in the shape of a heel-pushed heap about a foot away from each one. With a few exceptions every nest of the Common Tern was lined with coarse, sixpenny-sized pieces of Cockle and Oyster shells, those of the Little Terns being adorned by a handful of finer fragments. There can be no doubt these pieces of shell are collected by the birds instinctively for the sake of their useful retention of heat ; they certainly do not add to the comfort otherwise. All the eggs were not only warm to the touch, but the lining of shells was distinctly so also. Their Ring-Plover neighbours used still smaller fragments. A few of the larger Terns' nests were lined with dry grass-bents, and formed really comfortable cosy habitations.

Here and there we came across patches of pebbles running larger, many of the size of the Terns' eggs, others up to that of a hen's egg ; these seemed to be seldom wetted, even by the sea-spray, and were of a blue-grey colour ; many of them were plentifully spotted with a minute lichen, which I have been referred to as *Lecanora aspersa*, and also as *Lecidea petræa*, the

latter most probably being the correct name. Wherever a trio of eggs had been located amongst these the similitude was remarkable. I took a stone or two home with me, and, placing egg and stones together, made a coloured sketch of them, "just for the novelty" of it. These lichen-spotted stones do not occur at Yarmouth, where all the shingle-strips are subject to the laving of the sea-waves, but at Aldborough, on the Suffolk coast, under conditions like those obtained at Wells, I found long stretches of them exactly corresponding in appearance.

We presently hid in the long marram-grass on the higher sand-heaps, when the Terns with no more ado simply flew above their nests, and from an elevation of ten or twenty feet alighted right down upon them, their wings closing as their light buoyant bodies touched their precious eggs. The wind was easterly, and nearly all their previously agitated manœuvres had been performed head to it; and they, without exception, sat upon their eggs with the bill pointing eastward. The clamour ceased at once. Just prior to our sitting down on the sand-dune we flushed a Red-legged Partridge from its nest, the startled bird dashing across the nesting area, whereupon the angry Terns darted down at it, and fairly mobbed it out of sight.

I regret that my time was so limited, for the nesting habits of the Terns are exceedingly interesting; and Tom Cringle himself, a characteristic son of the marshes, was "no chick" at bird-lore, or uninteresting in his conversation. A mighty hunter of wild-fowl he may be in the winter months, but a famous and reliable watcher he appears to be in his proper season; and I question whether any of the "egg-poaching" fraternity would profit by trying any of their games upon him. That the very splendid protection given the Terns at nesting-time is rewarded by good results seems to be an assured fact, and one only regrets that on their passage south in the autumn they should be treated with scant kindness by irresponsible and reprehensible gunners. It is gratifying, too, that at Cley and Blakeney, equally famous nesting places, similar protection is afforded them; and the report issued by this Society is so entertaining, that I am constrained to copy a few lines from the watcher's report for 1904:—

"June 22nd.—Found Lesser and Common Terns' and Dottrells' [Ringed Plovers'] nests with eggs.

“*May 28th to end of month.*—Plenty of fresh nests.

“*June 12th.*—First clutch of Lesser Terns and Dottrells hatched out.

“*June 13th and 14th.*—First lot of Common Terns hatched; strong healthy birds.”

The last line of R. Pinchin's report is most satisfactory:—
“I am sure there are more Tern, Sheldrake, &c., come every year.”

Such efforts to preserve some of our most beautiful British birds are praiseworthy, and the results truly gratifying, and should not be hampered in any way by lack of funds. Messrs. Q. E. Gurney, of Northrepps Hall, and C. A. Hamond, of Twyford Hall, are the Hon. Secretaries of these useful societies.

NOTES AND QUERIES.

A V E S.

The Hawfinch in Epping Forest.—On May 14th we found a dead male Hawfinch (*Coccothraustes vulgaris*) in the Bury Wood, near Chingford. It appeared to have been killed by some sort of missile only a few hours previously, the clot of blood upon the wound being quite fresh. We took the specimen home, and had it stuffed and mounted. Mr. Howard Saunders ('Illustrated Manual of British Birds') describes the bill of the adult male Hawfinch in summer as "dull black at tip, leaden blue at base." This description applies to our specimen when the bill is viewed from above or from the side, but the under surface of the mandible is, to quote Mr. Howard Saunders again, "pale horn-colour," the colour noted for the bill in both sexes in winter. We should add that prior to the finding of our bird we had already observed the Hawfinch in the forest upon a few occasions.—F. W. & H. CAMPION (33, Maude Terrace, Walthamstow).

Albinic Form of Starling.—I have an immature specimen of *Sturnus vulgaris* in my possession, which was shot at Leeswood, Flintshire, on the 2nd ult. It is absolutely cream-white in colour, and I thought it worthy of record. Judging from the condition of its plumage, &c., it could not have left the nest more than a day or so.—A. NEWSTEAD (Grosvenor Museum, Chester).

Notes on the Tawny Owl (*Syrnium aluco*).—Last April a pair of Tawny Owls nested in one of the holes in our church-tower, and laid three eggs. One of these was infertile, having apparently been damaged by the claws of the sitting bird, but the other two were hatched. On one occasion I found a half-eaten Rat in the nest, and on another visit I found three Rats (all half-consumed), and a Field-Mouse. Two at least of these Rats were old ones, and I believe that the superior size and weight of the Tawny Owl enables him to kill these vermin when a White Owl could not do so. Much to my regret I found the cock bird huddled up in a corner of the belfry one day, and found he had been dead some time. The misfortunes of the family did not end here, as about a week after one of the owlets was lying

dead on the gravel-walk under the hole, and the other had entirely disappeared. Four days later it was found by a woman, who took it home and kept it nearly a week. Whether it fluttered down from the nest, or whether it was removed by the surviving parent to one of the trees near, I cannot say, but it must have been fed by her. Having acquired it, I returned it to the tower, where I fed it daily for a time, but, as it never seemed to be very hungry, the mother had evidently found it, and it eventually took its departure. The corpse of the other unlucky fledgling was devoured with much satisfaction by a young Tawny Owl we have here, which is a very tame and a most amusing bird. As is the case with all carnivorous pets, his food supply is rather a difficult matter, and the lives of sundry young Starlings and Thrushes have been sacrificed to meet his requirements. He will, however, eat raw meat and liver, or even cooked meat, if disguised with a few feathers. Some of his actions are very like those of a Parrot, especially when he is doubtful about the edible qualities of a piece of food, and holds it up with one foot with two toes turned back. He does not in the least mind being fed by candle-light, which does not appear to be at all trying to his marvellously beautiful eyes.—
 JULIAN G. TUCK (Tostock Rectory, Bury St. Edmunds).

The Sounds produced by the Long-eared Owl (*Asio otus*). — Your correspondents (*ante*, pp. 183 and 293–36) do not take notice of a sound which resembles the quick striking together of the teeth of the lower jaw against the back of those of the upper jaw—snap, snap, snap, &c.—so. Years ago, when, having found a Long-eared Owl's nest, sometimes with eggs only, but often with both eggs and young, I have brought the old birds both "close up" by thus snapping my jaws together. Sometimes one or the other parent brought food to the young, but often both came without. I called them up, much as I have also brought Woodpeckers. At migration time—*i. e.* in the far north—the Owls are more easily brought up, by imitating the cheep of some small rodent.—J. A. HARVIE-BROWN (Dunipace, Larbert, Stirlingshire, N.B.).

AFTER reading Mr. Warren's note in the June 'Zoologist,' on "The Sounds produced by the Long-eared Owl," I must correct the suggestion I made in the same number, that the "oo, oo," described on his authority in the 'Birds of Ireland,' might be the call of the female rather than of the male Long-eared Owl. Mr. Warren's full description makes it quite clear that he means the monosyllabic cry of the male—the note which I syllable as "oop"—and not the more or less dissyllabic "shoo-oogh" of the female. But I think Mr. Warren's

communication and my own point to exactly the same conclusion as regards Mr. Gyngell's "Sound No. 1," *i. e.* that the latter is the cry of the female. When I call this cry "more or less dissyllabic," I mean that it is slurred downwards and very prolonged; there is no dividing line between first and second syllables as in the cry of the Cuckoo, but only a gradual transition as in the challenge-crow of the Partridge.—C. B. MOFFAT (36, Hardwicke Street, Dublin).

I HOPE the observations on the noises made by the Long-eared Owl will continue and extend to the other species of Owl also. In Northumberland nearly every plantation has its pair of Long-eared Owls, and large woods many pairs. I have visited scores of nests with eggs and young, and have kept several as pets. The noises I have heard them make are—(i) A short expiratory "hagh," which one can easily imitate by forcing air rapidly from the chest with the mouth wide open. Young in the down and grown birds do this when approached. (ii) "Snapping the beak," a sharp sound made, I think, by suddenly opening the beak when the pressure inside is reduced by suction. (iii) A silvery chirruping, which can be imitated by shaking a bag of small silver coins for about three seconds at a time. When one of my tame Owls flew to a perch where the other was sitting, the sitting one nearly always greeted it with this noise. I have heard it in the woods at dusk just when they are beginning to move about. These three sounds are the only ones my tame Long-eared Owls ever made. The night noises of wild ones I have never been able to discriminate from those of the Tawny, which in Northumberland nearly always inhabits the same woods. I know the long sad moan and "shoagging" described in the June 'Zoologist,' but I believe the Tawny sometimes imitates the former. I am glad to be able to put them down to the Long-eared on your correspondent's authority. I have never known a Long-eared make any noise at all when disturbed in the daytime either from its nest or roosting-place, and I must have disturbed them hundreds of times. On the few occasions on which I have seen them on the move at night (when I had no doubt as to the species) they have moved silently from perch to perch in short flights, and I have always thought them to be quiet birds. The Tawny, on the other hand, is a noisy creature, frequently "hooting" (a term including a great variety of noises), and uttering its loud "kee-yak." My captive Tawnies also made a similar "hagh" and snap of the beak to those of the Long-eared, but they never hooted, and seldom made the loud "kee-yak." Once I watched three young Tawny Owls sitting on a dead branch of a beech tree in the moonlight, and whenever the old ones brought them

anything they all set up a lively chirruping. I have never heard the Long-eared make the No. 3 sound Mr. Gyngell describes in the May 'Zoologist,' but one day I visited a Tawny's nest, with newly-fledged young, in a spruce-fir, and the old bird, when disturbed from the nest, flew from tree to tree close by, and every now and then brought its wings together beneath it with a loud "bock." I followed her about until satisfied as to how she did it. On another occasion (a bright sunny day) I came across a Tawny sitting in a small spruce-fir eating a Starling. When disturbed it behaved as I have never before or since seen one. It flew from top to top of the large spruce-firs, every now and then bringing its wings together with a "bock," and then uttering a loud prolonged laughing cry, like that of a Peregrine when one is near its nest. A Barn-Owl I kept used to snap its beak, and I have heard wild birds utter their ghastly shriek, a loud "kee-yak," like that of the Tawny, and the peculiar snoring noise of the young (and old ?) in the nest, and when sitting about in the trees after having left it. With our very defective night vision it is seldom one has a chance of fixing the author of any strange sound one hears. I long attributed the abrupt "chuck" of the Nightjar to the Long-eared Owl, until one night a Nightjar sat a few feet off me on a light dusty road making this noise. I therefore hope many of your correspondents will give us instruction on our lovely and interesting night-birds by recording the opportunities they have had of discriminating between their numerous and varied notes.—C. H. BRYANT (76, Grand Parade, Brighton).

Montagu's Harrier at Rainworth in June.—A keeper near here, having lost several young Pheasants, put it down to a Sparrow-Hawk, and on June 14th, in the dusk of the evening, seeing a Hawk, shot it; he brought it to me on the 15th, when I saw it was a male Montagu's Harrier (*Circus cineraceus*). I was indeed sorry, because one would suppose it was one of a pair, and most likely breeding in the forest, a large extent of which is heather and white grass, and is just such a place we should expect to find this species nesting, though so far I have never known it to do so. This is only the third specimen of this Hawk I have known to have occurred in Notts, and, curiously enough, all have been obtained near where this one was shot.—J. WHITAKER (Rainworth Lodge, Notts).

Nesting of the Merlin in Breconshire.—Two nests of *Falco aesalon* have been found this spring by a gamekeeper on the Nant-ddhu Grouse moor, about twelve miles south-west from Brecon, and about twelve hundred feet above sea-level. One was found on May 15th, and another on May 25th. The first contained three fresh eggs, and the

second four. They were on the ground surrounded by heather. I have in my possession eggs from both of these clutches. They are a good deal smaller than Kestrel's, and at a distance appear to be of a uniform reddish mahogany colour, but on close inspection are found to be covered with minute brick-red and black specks, and most of them have a slight purple tinge. On May 29th, 1888, a Merlin's nest containing four eggs was found by my friend Mr. Edgar Thomas on the same moor. He happened to be walking across a heather-clad hillside, and flushed the sitting bird from the nest. This set of eggs were placed in a Brecon collection, and are very like those above described. Meadow-Pipits, as well as Grouse, are very abundant on this moor, and Merlins are more numerous here than in most parts of South Wales, attracted probably by the food supply afforded by one or both of these species. The gamekeepers think that these little Hawks destroy the young Grouse.—E. A. SWAINSON (Woodside, Brecon).

Nesting of the Merlin in Derbyshire.—The Merlin is now so rare a bird in North Derbyshire that some account of its nesting here during the present season may be of interest. On May 29th I visited a nest of this species. It was situated about eight and half miles N.N.E. of Bakewell, on a wild and unfrequented piece of moorland, and among rank heather on the slope of a hill. It contained five eggs, quite fresh, and much darker in colour than those figured in Seeböhm's books. The two old birds had been shot a few days before, but they had left ample traces of their presence, for within a considerable radius of the nest were the spots where their prey had been devoured. The remains showed that Meadow-Pipits had been the most common form of food, but a Greenfinch and two young Grouse had afforded some variety. Many pellets were also found, but these have not been examined. On June 28th another nest was found six miles N.E. of Bakewell, and three miles from that above mentioned. It contained five young Merlins in down, with the wing-quills just beginning to sprout. The old birds were killed, the hen being trapped, and the cock being shot. I have not yet had an opportunity of seeing the nest and its surroundings, but there is no doubt that the young Grouse will have paid heavy toll to the growing Falcons.—W. STORRS FOX.

Night-Heron, Black-headed Bunting, and Great Sedge-Warbler in Sussex.—On Sept. 24th, 1904, an immature female of the Night-Heron (*Nycticorax griseus*) was shot at Pevensy, Sussex. On April 21st, 1905, a very fine cock Black-headed Bunting (*Emberiza melanocephala*) was killed at Little Common, Sussex, in full adult yellow

plumage. On May 1st, 1905, a fine male Great Reed-Warbler (*Acrocephalus turdoides*) was killed at Bexhill, Sussex. The above were all brought to Mr. Bristow, of St. Leonards-on-Sea, to be set up, and are now in my collection.—J. B. NICHOLS (Parliament Mansions, Westminster).

Hybrid Pochard in Norfolk.—Last year I received, from the Rev. B. Upcher, a Duck, supposed to be a female hybrid of some sort, which had been caught on Saham Mere, an attractive piece of water in Norfolk to wildfowl. The Duck was shy and in very obscure plumage, but has now grown tame, and will come to the edge of the pond for bread, which has facilitated its comparison with sundry Pochards and Tufted Ducks, alive and dead. It is evidently a female, for its plumage has altered but little, and that it is a cross between these two species seems very probable. The chin and throat are quite dark, the belly nearly white; there are perceptible vermiculations on the back, and it has a not very distinct bar of white on the wing. The eye is dark brown, and the beak in size and shape intermediate between the Pochard and Tufted Duck. Its under tail-coverts are white, and this is the only point in which it does not quite agree with either of the above species, but better with the Nyroca Duck, of which it should be mentioned a hybrid was caught on Saham Mere some years ago (*Zool.* 1898, p. 108). J. H. GURNEY (Keswick, Norfolk).

On the Nesting of the Rock-Dove (?) in a Rabbits' Hole at Nevay Park, Forfarshire.—Towards the end of April (1905), whilst inspecting the enclosure of broken ground on a steep slope on Nevay Hill, for the planting of blackthorns and cotoneasters, a Dog steadily pointed at what was understood to be an empty Rabbits' hole (for they had all been cleared out preparatory to the enclosure). On examination the keeper found a pair of young Pigeons with feathers partially developed. The hole occurred on the upper edge of the broken ground, and an aperture existed on the top as well as that beneath the ledge, the latter apparently being most in use. The birds had evidently been hatched where they were found, *viz.* about a foot within the aperture at the edge of the ledge, where they were perfectly secure from observation. Moreover, the slope is nearly a mile from a habitation, and in a very quiet region. The keeper thought they might be the young of Cushats frightened from the larch woods by boys, but this was unlikely, though Mr. R. M. Craig, a young naturalist at present at the Gatty Marine Laboratory, has found the nest of the Cushat within reach of the hand on low spruces in Glenfinnart, Argyllshire. A few days before a swift-flying Pigeon, like a Rock-Dove, had been seen on the

hill, and a few days afterwards a pair were noticed at a considerable distance from the spot, near which only Cushats had been seen. Meanwhile the birds were left in their hole, in the hope that the developing feathers would soon establish their specific identity. Unfortunately before a week elapsed they had disappeared. Since the foregoing date, however, a pair of Rock-Pigeons were again seen (June 24th) near Rabbits' holes in a different part of the hill. The nesting of the Rock-Dove in Rabbits' holes seems to be rare, though their habits in the caves of the Outer Hebrides would seem to show considerable power of adaptation to circumstances. It is known that other land-birds, such as Jackdaws, make use of Rabbits' holes for nesting. Thus Jackdaws not only do so on the cliffs at Craighall, Perthshire, but have been observed to seize the very young and frolicsome Rabbits and drop them over the precipice. The privacy of the slope at Nevay, and the absence of rocky ledges, probably led the birds to select such a site, just as in former years the quietude of a country house at Murthly enticed the Kestrels to make their nest and rear their young in a box (which the Swifts usually regarded as their own) originally placed under the eaves for Starlings.*—W. C. McINTOSH (The University, St. Andrews).

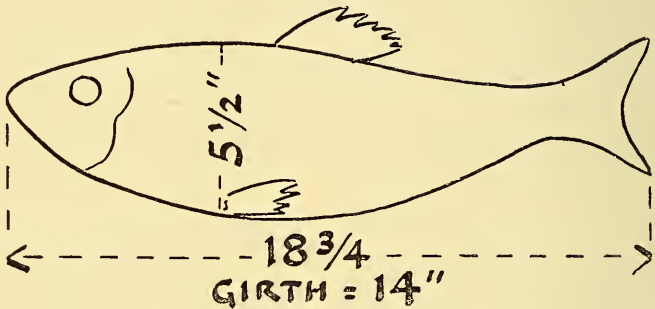
Effects of Rural Depopulation on Wild Life.—For the last year or two I have been taking rambles about the country-side, which men are abandoning more and more every day for overcrowded towns. I am struck with the great change this rural depopulation is making on the fauna of country districts. I have been making out lists of observed species in the locality where I happened to be from my boyhood upwards, and it is most interesting to me to compare these old lists with those I am daily adding to now. As I was saying, I am noticing decided changes. Not only is wild life more plentiful, but it is now really wild life, and not so much of that semi-domesticated type which is seen in the avian hangers-on to human society who love to haunt rural gardens, farmyards, corn-fields, and village lanes. In this connection I would like to say something about the reprehensible manner of making up local faunas and lists of species by lumping together all records of occurrences within half a century and more. The value of these local faunas would, in my opinion, be greatly increased were a comparison made between lists of thirty years ago and such as can be made out at the present time. This is especially true in these days when rural depopulation and land going out of cultivation by the thousand acres is making a comparison between the past and present

* 'Scottish Naturalist,' vol. iv. p. 46 (1877).

faunas of a particular locality very valuable.—ALBERT H. WATERS (Cambridge).

PISCES.

What is the Heaviest Weight reached by the Rudd (*Leuciscus erythrophthalmus*)?—The fish referred to by Mr. Green (*ante*, p. 256) is an undoubted Rudd, as its captor sent me a photograph of it in a case as set up by the taxidermist. In order that no doubt should appertain to its identity, I showed the photograph to Mr. Boulenger, who confirmed the identification. The weight of this fish (4 lb. 4 oz.) given by Mr. Green is so unusual that I wrote to that gentleman for exact measurements, and he kindly took off the back of the case and sent me following dimensions:—



I then sought the experience of Mr. R. B. Marston, the well-known editor of the 'Fishing Gazette,' as to the record weight of this fish, and the following reply was kindly sent me:—"The largest Rudd, recorded by Dr. Day in his 'British Fishes,' was taken by my late friend Dr. Norman in Norfolk, and weighed 3 lb. 1 oz. I may have recorded larger ones, but do not remember them. There is a Roach of nearly 4 lb. at the present Earl's Court Exhibition, as well as many large Rudd, but none quite 3 lb., I think." I have also written to our contributor, Mr. A. Patterson, who possesses such a wide knowledge of Norfolk fishes, but he could only inform me that this fish does not often exceed two pounds in weight, and his greatest weight record is the one taken by the late Dr. Norman, to which Mr. Marston has already referred. Consequently this record of Mr. Green is a very unusual one.—W. L. DISTANT.

THE ZOOLOGICAL SOCIETY'S GARDENS.

IN the month of June two acquisitions, one to the collection of Mammals, the other to that of Birds, overshadow the rest in importance. The mammal is a young female Orang-outan from Deli, Sumatra, presented by Dr. Graham. She is a perfectly docile and healthy animal, and, coming with a good appetite and at a favourable time of the year, will form a test case for the suitability of the Apes' House for members of this genus of Anthropoids. So far as can be judged from up-to-date results, Chimpanzees do well here; but it by no means follows that conditions that suit Apes of the latter kind are also suitable for Orang-outans. In view of what is known of their mode of life it seems probable that a house built on the principle of a well-ventilated conservatory, with a large tank of evaporating water, would be more in keeping with their natural habitat, namely, trees overhanging forest swamps, than the relatively dry cages in which the Chimpanzees live and thrive. From Mr. Rothschild the Society has received on deposit a second example of that rare and handsome species of Monkey, Wolf's Guenon (*Cercopithecus wolffi*), which is allied to the Mona and Campbell's Guenon; also a specimen of a species not represented in the collection for many years, the Pluto Guenon (*C. leucampyx*).

For a long time we have been on the look-out for a male Painted Ocelot. At length, through the kindness of the Right Hon. Charles Booth, we have received one from Cis-andean Peru, procured by H. E. Signor Fuentes. The four examples now in the collection admirably illustrate the great and as yet unintelligible colour variations presented by this species of South American Tiger-Cat.

Wild stock of domestic breeds have an interest all their own. Hence it is satisfactory to record the donation of a specimen, albeit young, of the Grecian Ibex (*Capra agagrus*), from Antimilo, one of the Cyclades, where this species, the progenitor of domestic Goats, still survives. To a question as to the possibility of this specimen being half-bred from wild and tame stock, Major Finnie, the donor, replied that, so far as his observations go, the wild Goats avoid and do not mingle with the domestic herds.

Another interesting ruminant is a female specimen of the daintiest and most beautifully marked of all Antelopes, the Harnessed Bushbuck (*Trapelaphus scriptus*), from West Africa.

The last addition to the Mammalia to be noticed is a pair of Orkney Voles (*Microtis orcadensis*), presented by Mr. Headen Cocks. This

very interesting species was described, it will be remembered, in 'The Zoologist' for last year by Mr. J. G. Millais. With the exception of the Skomer Bank Vole, all the known species of English Voles are now represented in the Zoological Gardens.

The important addition to the collection of Birds, mentioned above, is a series of eleven Kiwis, representing the North Island race of the original species, namely, *Apteryx australis mantelli*, or Mantell's Kiwi. The Society has to thank Lord Ranfurly, the Government of New Zealand, and Mr. H. C. Wilkie, F.Z.S., for the donation, and the latter also for his great care of the birds upon the long voyage home. It is certain that no such series of Kiwis has ever previously been exhibited in any European menagerie. Antipodean birds usually do well in England. Hence it is to be hoped that this morphologically isolated type will be for many years represented in the Gardens.

It is not often that that remarkable arachnid *Galeodes* is seen alive in England. In the Insect House, however, there is now a female of the Soudanese and Egyptian species, *Galeodes lucasii*, presented by Mr. W. G. Percival. In Egypt this animal is commonly known as the Tarantula, from its ferocious and spider-like aspect, and both in that country, in India, and South Africa fights between *Galeodes* and Scorpions are a common pastime of soldiers.

R. I. P.

OBITUARY.

WILLIAM THOMAS BLANFORD.

ZOOLOGISTS and geologists will feel an absolutely personal regret at the loss of Dr. Blanford, who passed away on June 23rd, in his seventy-third year, at Bedford Gardens, Campden Hill.

He was born on Oct. 7th, 1832, at 27, Bouverie Street, Whitefriars, in the city of London, the house and manufactory adjoining it belonging to his father, William Blanford, and which premises now form part of the printing and publishing offices of the 'Daily News.' Educated privately at Brighton, he was sent to Paris at the age of fourteen, where he remained till March, 1848, and then passed two years with a mercantile house at Civita Vecchia, the head of that firm being an old friend of his father's. Returning to England in 1851 he joined his father's business, but soon detected his true vocation, and entered the Laboratory of the Royal School of Mines under Lyon Playfair in 1852, and matriculated in the autumn of that year. After leaving the School of

Mines in 1854, he passed a year at Freiberg in Saxony, in the study of chemistry, mineralogy, mining, and metallurgy. It was in this year that he and his brother were offered and accepted posts on the Geological Survey of India, and it is from this date that an active scientific career commenced which was only terminated by death.

Dr. Blandford was one of those few men who are really scholars in the domain of their subject. His first published paper, in 1854, was "On a Section lately exposed in some Excavations at the West India Docks"; his almost last was in 1901, on "The Distribution of Vertebrate Animals in India, Ceylon, and Burma," printed in the *Trans. Roy. Soc.* He was attached as geologist and zoologist to the Abyssinian Expedition in 1867, which resulted in the publication of a well-known and valued volume; while subsequently another volume on the 'Zoology and Geology of Persia' was the outcome of his journey with another expedition. As a result of his labours in the Geological Survey, he had traversed, in the course of nine years, the whole peninsula on foot or on horseback, with the exception of some twenty or thirty miles, from the Arabian Sea near Surat to the Bay of Bengal at Coconada.

His zoological work, however, is focused in the volumes devoted to the 'Fauna of British India,' of which the vertebrates have been described and the invertebrates commenced. Some of these volumes he wrote, and all published to date he edited, and it seems only the other day, though the date was 1881, that at his request we supplied him with some statistics relating to the then scanty knowledge of the Indian Insecta, which he included in a paper "On our Present Knowledge of the Fauna inhabiting British India and its Dependencies," read before a meeting of the British Association. To have inaugurated and so long edited with conspicuous ability this well-known series of volumes is to have engraved his name in faunistic zoology. He was a good and conscientious editor, as those who served under him will admit; always courteous, he was yet constant to his own opinion, and when any divergence of view arose he was generally found in the sequel to be in the right, and if in a very few instances the contrary was the case, he was the first to acknowledge it. It is unnecessary to refer to the high posts he from time to time held in our scientific societies; suffice it to say he died in harness, after living a worthy and strenuous life in advancing the study of natural science, and died really regretted by his friends, and respected in all scientific circles.

COL. L. HOWARD IRBY.

It is with sincere regret for the loss of an old and valued friend and a thoroughly good and trustworthy ornithologist that I venture to send the accompanying notice to 'The Zoologist' of the death, on the 14th May last, of Col. Leonard Howard Irby, F.Z.S., F.L.S., &c.

I first met him at Gibraltar in 1870, when he was still in the service as a Major in the 74th Highlanders, and engaged in writing his well-known 'Ornithology of the Straits of Gibraltar.' From that time until the date of his death I saw a great deal of him, and was connected with him in various shootings, and in expeditions to all parts of the British Islands in search of materials for the series of bird groups at the Natural History Museum at South Kensington; also of British Lepidoptera for our own private collections. His knowledge of birds was wonderful, while his quick sight and accurate shooting lasted until the end. No one more thoroughly enjoyed a ramble over hill and dale, and a good bird-hunt, than he did. Moreover, he did not confine his energies to birds alone, but was a keen lepidopterist, and devoted to the study of wild flowers.

Born in 1836, Col. Irby was educated at Rugby School and at Wimbledon; he joined the 90th Light Infantry as ensign in 1854, and at once proceeded to the Crimea, where he served until the end of the war, including the siege of Sebastopol. During this period he managed to collect, and write notes upon, Crimean birds, which soon attracted attention; so that his further notes on the birds of Oudh, written while serving in the Indian Mutiny campaign, were gladly welcomed by the leading ornithologists of the day. It is interesting to record that he and Lord Wolseley, both in the 90th Light Infantry, together fought their way, with their respective companies, into Lucknow at the time of the memorable relief of that city. In 1864 Col. Irby was transferred to the 74th Highlanders, in which regiment he served until his retirement from the army, which took place, I think, in 1872.

The ornithological works by which he will best be remembered, and the accuracy of his knowledge of birds be appreciated, are the 'Ornithology of the Straits of Gibraltar,' first published in 1875, with a second and enlarged edition in 1895, and his 'Key-List of British Birds,' published in 1888. These may, I think, be looked upon as two important standard and classical works on birds, and are probably to be found on the bookshelves of every ornithologist of the present day. His other minor papers, including one in 'The Ibis' on the "Birds of Santander," are perhaps not so well known; but all are most interesting and carefully written.

Spain was his favourite hunting-ground, and there, in company with his genial and firm friend, Lord Lilford, he spent many of the pleasantest days of his life. Both of them were excellent Spanish linguists, both loved the sunny hills and woods of the peninsula, and thoroughly appreciated the attractive qualities of the natives. It was in Andalusia, of course, as well as on the opposite coasts of Morocco, that the materials for the 'Birds of the Straits' were so ably collected, and it was to Spain that poor Col. Irby's last expedition was made, when, ill and unable to endure the climate of England, he went out to Malaga for the past winter. Here he took up his quarters for some months on the shores of the Mediterranean, but unfortunately the weather even in this favoured region proved inclement, and by no means beneficial to him, and he returned home only to die shortly afterwards of heart-failure at 14, Cornwall Terrace, Regent's Park. He was buried at Kensal Green Cemetery, followed to the grave by many sorrowful old friends. His residence in Cornwall Terrace commenced in December, 1889; it was a most suitable position for him, as it was close to the Zoological Gardens, the Botanical Gardens, and Lord's Cricket Ground, of all of which institutions he was a member. He served often and ably on the council of the Zoological Society, and was keenly interested in all matters pertaining to the animals and their management. He was also a frequent visitor to Lord's, and enjoyed seeing good cricket as much as anyone. Many a good match have I watched from the pavilion in his company, and I had hoped to sit there alongside him again this summer. But this is not to be, and so I will conclude with the expression of the hope that these hastily written lines may prove of interest to his many ornithological friends.

S. G. R.

Yalding, Kent.

EDITORIAL GLEANINGS.

Biologia Centrali-Americana.—We have to thank Mr. Champion for the following statistics relating to this great biological publication:—

Progress of the zoological portion of the work up to March, 1905 (including parts 1–187).

Forty volumes completed, twenty-nine of which are devoted to Insecta.

The number of species already enumerated or described, and the subjects still awaiting treatment, are as follows:—

Subjects treated.	Total Number of Species.	New Species described.	Subjects not yet treated.
Mammalia	177	—	Pisces.
Aves (4 vols.).....	1413	14	Crustacea.
Reptilia and Batrachia	695	63	
Terrestrial and Fluviatile Mol- lusca	887	82	Coleoptera (certain families of Rhyncho- phora).
Araneidea and Opiliones (2 vols.)	1181	837	
Scorpiones, Pedipalpi, and Soli- fugæ	69	8	
Acaridea.....	47	43	Hymenoptera Acu- leata.
Chilopoda and Diplopoda*.....	71	32	
Coleoptera (16 vols.; † all fin- ished except Rhynchophora) }	15,293	9659	Micro-Lepidoptera.
Hymenoptera (3 vols.).....	2202	1053	
Lepidoptera (6 vols.)	5444	1672	Neuroptera (other than Ephemeriðæ and Odonata).
Diptera (3 vols.)	2320	993	
Rhynchota Heteroptera (2 vols.)	1700	870	
„ Homoptera (2 vols.) ‡	1168	616	
Orthoptera (2 vols.) ‡	877	310	
Neuroptera*	152	44	
	33,696	16,296	
Totals for Insecta alone	29,156	15,217	

* In course of publication.

† Thirteen volumes completed, three in course of publication.

‡ Vol. ii. in course of publication.

“*Plague of Pike.*—According to Mr. T. C. Daniel, president of the Exe Board of Conservators, Pike are playing great havoc among the Trout in the Exe at Tiverton. The Watch Committee are to consider the best means of ridding the river of the pest.”—*Daily Chronicle*, May 15th.

THE famous snake-catcher of the New Forest, “Brusher” Mills, has been found dead at Brockenhurst. Of unkempt and decrepit appearance, the old man had for many years lived a hermit’s life in a secluded part of the forest near the King’s hunting-ground, and was in many ways a quaint character. Venturesome tourists sometimes came across Mills while he was out “hunting.” With much dexterity he would pick up the snakes between his fingers and transfer them to the large tin can which he carried fastened to his waist. It is calculated that Mills caught between five and six thousand snakes during his many years’ residence in the forest. These he disposed of to the “Zoo” authorities as food for the larger reptiles. Shortly before his death Mills visited the railway hotel at Brockenhurst, and afterwards his lifeless body was found in an outhouse.

WE have received the “Fourth Report of the Government Entomologist” (Mr. Claude Fuller), published by the Department of Agriculture of Natal. In addition to insect-pests, we find the following complaint as to the arrival of *Passer domesticus* in the “Garden Colony” :—

“The presence of this pestiferous bird in Durban, and the certain indications of its increase since April, 1902, when Mr. J. D. S. Woodward called attention to it, are sufficient reasons for introducing some notice of the bird into this report. Apart from that, since I have become acquainted with its establishment at the port, I have considered it my bounden duty to urge its extermination upon all and sundry. The Sparrow is receiving the same apathetic attention here that it has received elsewhere, whilst it is establishing itself in a new field and under fresh conditions and circumstances.

“The circumstances of its introduction are similar to other cases, and can only be described as ‘the mistaken enthusiasm for things English.’ I gather that a few birds were imported by a gentleman in Durban some six years ago. These he kept in captivity for some time, and then, because their chattering was such a nuisance, they were turned at large.

“The situation at present is this: the English Sparrow, which must be classed amongst the worst of vermin, is now established in Durban, but so far does not extend to the rest of British South Africa. Nothing to control its increase and spread is being done, and the question is whether we in Natal are to sit idle and allow the pest not only to become a nuisance to ourselves, but a menace to the rest of the colonies.

“I know there are arguments against the extermination and destruction of Sparrows. They are all the same, and have been used over and over again, but they are mere platitudes of senseless and ignorant or unobservant people. The case for and against the bird has been fought out again and again. It has been argued before Select Committees of the House of Commons, and before those of colonial legislatures. It has been argued by many scientific men in many lands, and in every case the weight of evidence has been against the Sparrow, and the verdicts such as to warrant this colony in taking every measure to suppress the birds altogether, at once and at any cost.”

THERE is always a romance attached to the obituary of the last representative animal in a local fauna, and this applies to the last wild Red Deer in Co. Donegal. This story, as told by Mr. W. F. de Vismes Kane, has been recently communicated by Mr. R. Welch to our excellent contemporary ‘The Irish Naturalist,’ and we venture to reproduce it as it appeared, for it would lose by abstract or condensation:—

“It must have been about the year 1862 that I was Salmon-fishing in the Lackagh, and Mr. Stewart’s (of Ards) water-keeper, Edward Gallagher (if I do not mistake a name that was once familiar to me) attended me. The Salmon were then more keen at taking the fly than they became afterwards, and he was a sure hand with the gaff. He had a very old bedridden father—he might have been ninety years old from his looks—who told many stories about that part of the country. He said *his* father, a very old man, told him that when he first came to those parts the country was very sparsely inhabited, and to see any of his neighbours he had to travel over the hills and bogs seven to ten miles. The Lackagh was then so full of Salmon that it was easy to gaff as many as one wanted in the season, and the rocky banks (‘*Lack*’agh) were full of wild cats, who fed on the fish killed by the Otters, and left with only a bite or two taken out of them. Also that there were still plenty of Deer in the mountains still surviving, and that very occasionally word was sent round that part of

Donegal to appoint a day and have an organized hunt. Certain passes were known and appointed, toward which the whole available beaters drove the Deer, and a palisade on each side was repaired, which narrowed little by little as it approached a bog. Here right across the mouth of the palisaded route was dug a very deep trench in the bog, at the bottom of which were upright sharp stakes, and all this was lightly covered with heather. This story carries one back, I should say, to the beginning of the eighteenth century.

“The manner in which the last Deer was killed is as follows, and happened quite in the old man’s lifetime, if I recollect aright:—There was a single surviving Stag frequenting Glenveigh. Many times he was hunted, but never could be shot. It was observed that whenever the chase took a certain direction he evaded his pursuers, and those lying in wait, by making for a path which crossed the precipitous face of a mountain (probably one of those on the far side of the lake from the present castle). This path at one place was broken off, and the Stag jumped the gap, and followed the track on the other side. On one occasion an old woman, hearing the shouting, concluded that the quarry was once again trying this method of escape. She was on the far side of the gap, and so, taking off her red petticoat, she placed it on the stone on the edge where the Deer would alight when he took his usual leap. The animal, coming to the off-take, swerved in his jump to avoid the unwonted and surprising coloured garment. He slipped on alighting, and could not retrieve his footing, but fell down and was killed.”

IN the ‘Newcastle Daily Journal’ for July 8th there appeared a communication respecting the occurrence of the Rustic Bunting in the North of England. Mr. Thomas Thompson, of Winlaton, writes as follows:—

“It is over six months ago since I mentioned to you that I hoped to have something to say respecting a ‘Rustic Bunting’ (*Emberiza rustica*). Mr. I. R. Slack, a neighbour of mine, had it exhibited at the Crystal Palace cage-bird show in January last, where ‘Mr. Walter Swaysland was one of the judges, and he pronounced it most emphatically to be not a Rustic Bunting.’ The words I have just quoted are taken from the ‘Feathered World,’ a newspaper published in London. This bird has been in Mr. Slack’s possession since 1903, and was caught near Seaton Sluice, Northumberland. I compared the specimen with a skin I obtained from London a few weeks ago, and it agreed with the latter closely. I may also state that Canon H. B.

Tristram, of Durham, saw Mr. Slack's bird, and said no doubt it is a hen Rustic Bunting. Very few specimens of this species have been seen in England, and its name does not appear in Mr. Hancock's Catalogue of the Birds of Northumberland and Durham.'"

MR. J. TRAVIS JENKINS, writing in the July issue of ' Knowledge and Scientific News ' on the subject of the migration of flat-fish, states :—

" The majority of scientific experts agree that round fish, *i. e.* fish of the Herring and Cod type, perform migratory movements of considerable magnitude, but as regards flat-fish, *i. e.* Plaice, Soles, and Flounders, the consensus of opinion is by no means so unanimous.

" The International Committee for Investigation of the Seas, which has quite recently been established, has taken up, among other problems, the question of the migration of members of the flat-fish family, or *Pleuronectidæ*. This international committee consists of scientific experts nominated by the Governments of England, Norway, Sweden, Germany, and Holland, and is subsidized by grants from the respective Governments. Batches of marked *Pleuronectids*, chiefly Plaice, have been marked from time to time, and then liberated at various points in the North Sea. The mark used consists of a silver wire, which is threaded through the body of the fish. To this wire are attached on the under side a bone button, and on the upper side a numbered brass label. Each fish is carefully measured and labelled, the whole operation from the time the fish is removed from the tank to the time it is replaced taking less than one minute. It is hoped that by these experiments the amount and nature of the migration of flat-fish will be determined, and attempts will be made to show the influence of the environment on migration. The intensity of fishing in any given area can be determined by the proportion of fish recaptured to the total number of marked fish returned to the sea. Since each marked fish is carefully measured both when it is returned to the sea and when recaptured, the rate of growth can also be determined. Plaice seem to withstand the marking operation wonderfully well, but Soles are far more difficult to deal with successfully. No doubt other results will be arrived at, notably the efficacy of closed grounds in maintaining a reserve of fish, and the effect of the density of fish population on the rate of growth."

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NOTES ON THE DRAWINGS

FOR

SOWERBY'S 'ENGLISH BOTANY.'

By F. N. A. GARRY.

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THE ZOOLOGIST

No. 770.—August, 1905.

BIOLOGICAL SUGGESTIONS.

EXTERMINATION IN ANIMAL LIFE.

Part I.—BY NATURAL OR NON-HUMAN AGENCY.

BY W. L. DISTANT.

We need not marvel at extinction; if we must marvel, let it be at our own presumption in imagining for a moment that we understand the many complex contingencies on which the existence of each species depends.—CHAS. DARWIN.

There is no species of animal which is not exposed to destruction through various accidental agencies—by hunger or cold, by drought or flood, by epidemics or enemies, whether beasts of prey or parasites.—A. WEISMANN.

To me the greatest marvel is the countless, the infinite number of the organisms that have existed, each with its senses and feelings, whose bodies now help to build up the solid crust of the earth.—RICH. JEFFERIES.

“IMPERFECTION of the Geological Record” is a phrase that justly accounts for many of those lacunæ which disfigure, but do not impair, the evidential structure on which rests the conception of animal evolution. To realize how many links must be missing from the palæontological cable which moors the present fauna of this planet with the life existing in the ages of the past, we have only to study and enumerate the frequent dislocations which occur in our own time to the chain of life. Extinction and extermination are terms which zoologists are too often compelled to use. Hunters no longer seek the Bison on the American

prairies—the few survivors of that species are protected in a refuge locality; the Quagga is absent from the South African veld; the egg of the Great Auk has now an enhanced and melancholy value to oologists; the Dodo is extinct on the island of Mauritius, where in 1598 it was found abundant; Steller's Sea-Cow is no more. We now only read of "the last of the Tasmanians," and the encircling gloom is gathering around the Australian aborigines; while the Kalangs of Java, described by Keane as in some respects the most Ape-like of human beings, are practically extinct. As Prof. J. M. Tyler has well observed, the marsupials, except the Opossum, are confined to Australia, and the oviparous mammals or monotremes to New Zealand. Formerly the marsupials at least ranged all over Europe and Asia, for we have indisputable evidence in their fossil remains. But they have survived only in this isolated area, and here apparently only because their isolation preserved them from the competition with higher forms. If the Australian continent had not been thus early cut off from all the rest of the world, the only trace of both these lower groups would have been the Opossum in America and certain peculiarities in the development of the egg in higher mammals. This shows us how much weight should be assigned to the formerly popular argument of the "missing links." The wonder is not that so many links are missing, but that any of these primitive forms have come down to us.* As an incentive to investigation of the zoology of the Sandwich Islands, it has been stated "valuable collections are being made and brought home, and unless these are made now they can never be done, as the extinction of much of the present fauna is not only inevitable, but will be immediate."† Fortunately much has recently been done in investigating this fauna. The steady march of evolution can only be studied by the records of palæontology; the lacunæ in the faunistic record of the past can only be really understood by what is going on around us, and has occurred in recent times. Not the decrease of individuals, but the annihilation of species is what we too frequently record, and when we reflect that such studies and records are absolutely quite modern even in historic times, we may well imagine what

* 'The Whence and the Whither of Man,' pp. 87-8.

† 'Report Committ. Brit. Assoc. Ipswich,' 1895.

has taken place in the past. The views of the earlier naturalists on this subject have shared the fate of many species, and become practically extinct. Even Linnæus evidently believed in the permanence of types. He wrote: "Thus, whilst all things are purified, all things are renewed, and an equilibrium is maintained; so that of all the species originally formed by the Deity, not one is destroyed."*

When we begin to analyse the causes that have operated in the destruction of so much animal life, two main factors are at once recognized—(1) natural phenomena, in which the action of man is entirely absent or scarcely perceptible; (2) the sole agency of man, either directly or indirectly. The first must have been the most gigantic, acting long before the appearance of man upon the earth, unremembered, unrecorded, due to events in which our own lives played no part; not necessarily more cataclystic than what occurs now, but covering an infinity of time compared to our own little era, and forming a resultant which we still imperfectly appreciate. The very walls of our museums, the outside structures that protect and shield the examples of a too often vanished fauna and flora, are frequently composed of or contain the relics of long extinct species. The Leitha limestone, largely used for building purposes in Vienna, comes from extensive nullipore banks in the Leitha Mountains, southwest of Vienna on the Hungarian frontier; and just as in Paris many of the finest buildings are constructed of the consolidated calcareous remains of Foraminiferæ, so in Vienna are the incrustations of certain red seaweeds put to this purpose.† Some of the Egyptian pyramids are composed of limestone nearly solely consisting of the remains of extinct Nummulitids, and the cathedral of Gerona is built of the same material. Beneath London itself, in the clay on which it stands, are the embedded remains of a long extinct plant and animal life. Many of the fruits, for instance, are the produce of palm-like trees (*Nipa*) akin to the screw pines, and similar to those now growing in Bengal, in the Philippine Islands, and elsewhere in the East Indian Archipelago; while others are the cones of plants (*Pro-*

* Preface to 'Museum Regis Adolphi Friderici.' Transl. by J. E. Smith, "Tracts relating to Nat. Hist.," p. 18 (1798).

† Cf. Kerner & Oliver, 'Nat. Hist. Plants,' vol. ii. p. 667.

teacæ), similar to those which at the present day flourish in Australia.* Many shells, "though they belong to extinct animals, resemble those which are confined at the present day to warmer seas," including a fossil *Nautilus*, a genus which is represented by several species in the London clay.† Even our roads are sometimes paved with the remains of "extinct monsters." I remember some years ago, near Street, a village in Somersetshire, watching some stone-breakers at their melancholy occupation, and, as they broke up the Blue Lias with their hammers, the teeth of some old Saurians were exposed. Our coal-scuttles contain the remains of extinct plants, and the hideous pall of black smoke vomited from the industrial centres of which our pseudo-civilization is so proud proclaims the combustion of a flora no longer existant. The fossil resin from extinct *Coniferæ* supplies the amber mouth-piece of the pipe we smoke; we ourselves are living species surrounded by and making use of the remains of others long extinct.

The effects of glacial epochs are perhaps now beginning to be understood as of a sometimes more exterminative and of a less distributive character than was formerly the general opinion. It was quite simple to invoke a glacial epoch as a giant spectre which first drove living nature south, and then attracted its return by the genial influences which attended glacial retreat. Retreating forms of life through glacial influences, and their subsequent return when such phenomena were alleviated, was a common argument in all distributive essays; it is now becoming an axiom in the study of evolution that these icy visitations often caused wholesale extermination. Many animals and plants stayed to die before they endeavoured to flee and live—at least, very often so. The gradually approaching conditions of a severe environment insidiously weakened plant and animal life; lethargy anticipated death, sudden changes of temperature effected wholesale slaughter, and, as in our own casual and unusually severe winters, there are swift swings of the pendulum which determine the effacement of much that would have survived had the stress been gradual. In these glacial spasms the intensified effects took place of what we can only realize in the

* Huxley, 'Physiography,' p. 229.

† *Id.*, *loc. cit.*, pp. 288-9.

present day, and in our own climate, by observing the deadly operation of one night's extra and unusual severity of frost on much plant life, or the avian destruction during an exceptionally severe winter. Even in present sunny Italy periods of nipping cold have taken place; for, as Gilbert White argued: "Surely the judicious Virgil, when writing a didactic poem for the region of Italy, could never think of describing freezing rivers, unless such severity of weather pretty frequently occurred."* Mr. Dixon has somewhat recently expressed his opinion that the conditions of the Ice Age, instead of being grand incentives to southern migration, exerted a vast exterminating influence, and that they must have caused the utter extinction of every species whose breeding range was entirely confined to the areas glaciated, or sufficiently within the influence of glaciation to render existence impossible. The effects of the Glacial Epoch on the dominant Euro-Asian fauna are shown to be exterminating rather than incentive to southern migration.† The same opinion has been expressed by Mr. Emery in studying the distribution of Ants: "Later the Glacial Epoch destroyed in Europe nearly all the rest of tropical insects, their return being made impossible by the natural barriers of sea, deserts, and mountains accumulated southward and eastward of our continent."‡ Sir Charles Lyell, in remarking on the absence of organic remains in stratified drift of the glacial period, regards the possibility of their having been originally scarce, and not simply destroyed by time, rain-water, and other agencies, for, as he writes, "we read of the water of the sea being so freshened and chilled by the melting of icebergs in some Norwegian and Icelandic fiords, that the fish are drawn away, and all the mollusca killed."§

We have many records of the baneful effect of sudden and severe cold on birds. The Rev. J. C. Atkinson, writing in 1891, relates that on a Whit-Monday some thirty years previously three inches of snow fell, and there were two nights—those

* 'Nat. Hist. Selborne,' Harting's edit., p. 151.

† 'The Migration of British Birds,' p. 287.

‡ "On the Origin of European and North American Ants," 'Nature,' vol. lii. p. 899.

§ 'The Antiquity of Man,' 4th edit. p. 296.

preceding and succeeding it—of very hard frost. “One of the consequences was the bursting, under the tender mercies of the frosty temperature, of hosts of the Grouse eggs” on Westerdale moors, and the equally exposed parts of Danby high moors.* In this case the majority of the birds were believed to have nested again, and no loss, excepting a late maturing, occurred. But in glacial approaches these visitations would have been more recurrent, and probably not followed by sufficiently genial weather. I noticed in the Transvaal, on the high veld at Pretoria, where the so-called winter is a dry season of delightfully temperate days and cold nights and mornings, that now and then a sharp frost supervenes for a few days, or rather nights, with fatal consequences to introduced plants, such as young blue-gums, acacias, &c. The only swannery in England is the one at Abbotsbury, near Weymouth, belonging to the Earl of Ilchester, where, in 1880, there were upwards of fourteen hundred birds. The severe winter of 1880–81 reduced the number of Swans to about eight hundred, an average which has since been maintained.† Hardy as Rooks are, “a long frost kills them in numbers, principally by slow starvation. They die during the night, dropping suddenly from their roosting-place on the highest boughs of the great beech-trees, with a thud distinctly heard in the silence of the woods.”‡ Darwin estimated that the winter of 1854–55 destroyed four-fifths of the birds in his own grounds.§ Mr. Boardman, who had great experience with birds in Canada, informed Dr. Leith Adams: “I remember during the cold season of 1858–9 that Crossbills and Pine-finches were very numerous, and I procured a large number in February, to see how far the eggs had advanced, and found them nearly as large as buck-shot. Two days afterwards we had a *warm shower, then a sudden change to extreme cold*, which killed every small native bird in the woods, where we found their bodies in abundance.”|| Mr. Kearton writes, that in the memorable winter of 1895 great numbers of Grouse perished from starvation on the northern

* ‘Forty Years in a Moorland Parish,’ p. 317.

† ‘Roy. Nat. Hist.’ vol. iv. p. 337.

‡ Jefferies, ‘The Gamekeeper at Home,’ new edition, 1890, p. 115.

§ ‘Origin of Species,’ 6th edit. p. 54.

|| ‘Field and Forest Rambles,’ p. 125.

hills; "and whilst nest-hunting in Westmorland ghylls and Yorkshire dales the following spring my brother and I found skeletons every day."* Neltje Blanchan describes the Hermit Thrushes (*Turdus aonalaschkæ*), whose range is in the eastern parts of North America, as being very rare since the severe cold and storm in the Gulf States a few winters ago, when vast numbers died from cold and starvation.† Rider Haggard has detailed his experiences in one of the islands of the Hebrides during the terrible winter of 1890-91. The keeper there told him that he picked up many Snipe, dead or dying, by the side of the frozen watercourses; indeed, the Snipe on that island, where they used to swarm, have only recently begun to recover in numbers from the effects of that year of desolation. During an exceedingly rigorous winter in Orkney, in 1894, as Mr. Campbell thinks, hundreds of Cormorants perished from hunger. In a roofless hut, a few yards from high-water mark, he counted fourteen dying and dead. Rats were busily devouring the dead, while the living stumbled weakly over the half-eaten bodies of their comrades. In the most unlikely places they were to be met with, coming right up to the doors, as if begging for shelter. One of them surprised him by waddling into the workshop, passing over his boots, as if unconscious of his presence, and settling underneath the bench to die.‡ These instances of the fatal consequences of sudden and severe cold on the lives of birds are only few and partial; they are but indications of what must frequently occur in the present living epoch of the earth, and their records fulfil the purpose of drawing attention to similar catastrophes that must necessarily have happened in the past. We could add indefinitely to the list did space allow, but must somewhat hastily refer to the exterminating effect of glacial processes on other animals, especially on mammals.

Scotland was visited with an exceedingly violent snowstorm on the night between the 24th and 25th January, 1794. James Hogg, the "Etterick Shepherd," has graphically described its devastations. In that division of the South of Scotland that lies between Crawford-muir and the Border seventeen shepherds

* 'With Nature and a Camera,' p. 163.

† 'Bird Neighbours,' p. 126.

‡ 'Notes on the Nat. Hist. of the Bell Rock,' p. 101.

perished, and upwards of thirty were carried home insensible. The number of Sheep that were lost was beyond calculation. Whole flocks were overwhelmed with snow, and their bodies were not recovered till the snow disappeared. The greater part of the rivers on which the storm was most deadly run into the Solway Frith, on which there is a place called the "Beds of Esk," where the tide throws out and leaves whatever is carried into it by the rivers. When the flood after the storm subsided there were found on that place, and the shore adjacent, 1840 Sheep, 9 Black Cattle, 3 Horses, 2 Men, 1 Woman, 45 Dogs, and 180 Hares, besides a number of "meaner animals."* The herd of Deer in Martindale Forest was estimated to number about three hundred head, but about fifty succumbed to the hardships of the terrible winter of 1893-94.† The following instance appertains partly and largely to the direct action of man, but, as cold was the original enemy, it is recorded here in the words of Mr. Baillie-Grohman. In a severe blizzard which swept over Colorado in the last week of January, 1893, a band of about one thousand Wapiti became imprisoned by the snow on a high and heavily timbered *mesa* in the mountains near Steamboat Springs. Ranchmen, prospectors, and hide-hunters, on hearing of the windfall, "waded in," killing many with clubs, as the local papers reported, and I believe not a single beast was allowed to escape.‡ According to Dr. Altum, a German forester, "the most terrible enemies of Mice are not other animals, but such sudden changes of weather as occur almost every year. Alternations of frost and warm weather destroy them in numberless quantities; one single sudden change can reduce thousands of Mice to the number of a few individuals." He also states that a succession of gales or cold and damp weather during the exodus of the Pine-moth (*Bombyx pini*) destroy it to incredible amounts, and during the spring of 1871 all these moths disappeared at once, probably killed by a succession of cold nights.§ Even fish suffer from a like cause. Col. Custance tells us that in Salmon rivers a very severe frost has been known to affect

* Cf. Low, 'Domesticated Animals of the Brit. Islands,' pp. 106-7.

† Rev. H. A. Macpherson, 'Red Deer,' p. 30.

‡ 'Fifteen Years' Sport and Life,' &c., p. 33.

§ Quoted by Prince Kropotkin, 'Nineteenth Century,' vol. xxviii. pp. 716-17.

the spawning-beds, and to destroy the whole of one year's crop of eggs.*

Plants are, as well known, particularly sensitive to these visitations. M. de Lanessan remarks : "None will be ignorant of the terrible havoc which an unseasonable cold produces on fruit-trees. The least hoar-frost occurring at the time when the shoots of the vine begin to expand is sufficient to destroy that year's vintage. An intense frost occurring at the same time would decree the death of the plant itself."† A winter storm at the end of December, 1886, was especially disastrous to junipers. Snow came on early in the evening when the thermometer was barely at freezing-point, and there was no wind. It hung on the trees in clogging masses, with a lowering temperature that was soon below freezing. The snow, still falling, loaded them more and more; then came the fatal wind, and all through that night was heard the breaking trees. When morning came there were eighteen inches of snow on the ground, and all the trees that could be seen, mostly Scotch-fir, seemed to be completely wrecked. Some were entirely stripped of branches, and stood up bare like scaffold-poles. This refers to only one spot in England.‡ We all remember Gilbert White's account of the January frost in 1768: "The ilexes were much injured, the cypresses were half destroyed, the arbutuses lingered on, but never recovered; and the bays, laurustines, and laurels were killed to the ground, and the very wild hollies, in hot aspects, were so much affected that they cast all their leaves."§ Of the December frost in 1784, the same writer states: "The frost killed all the furze and most of the ivy, and in many places stripped the hollies of all their leaves."|| The study of fossil flora discloses the fact that the temperature of the globe has been always on the decline; in ancient epochs it was very high.¶

Dr. John Murray, in discussing the undoubted resemblances

* "The Trout" ('Fur, Feather, and Fin Series'), p. 170.

† Quoted by Coe, 'Nature *versus* Natural Selection,' p. 67.

‡ Cf. Gertrude Jekyll, 'Wood and Garden' (ed. 1899), p. 27.

§ 'Nat. Hist. Selborne' (Harting's edit.), p. 302.

|| *Id.*, *loc. cit.*, p. 308.

¶ Cf. M. Quinton (English transl.), *Ann. Mag. Nat. Hist.* ser. 6, vol. xviii. p. 64.

between the faunas and floras of high northern and high southern latitudes, as shown in the arctic and antarctic marine faunas and floras, is disposed to consider or invoke the deadly effects of a very ancient chilling influence. "In order to give a rational explanation of these remarkable facts in the distribution of marine organisms at the present time, as well as of the presence of tropical fossils in Palæozoic and even later geological strata within the polar areas, it seems necessary to assume that at one time there was a very different distribution of heat and light over the surface of the globe than what obtains at the present time. A uniform high temperature all over the surface of the globe in the early stages of the earth's history is required to explain these phenomena. In later Mesozoic times a gradual cooling at the poles appears to have set in, and slowly brought about the destruction of a large number of the shore and shallow water animals, especially those which secreted large quantities of carbonate of lime, or were provided with pelagic or free-swimming larvæ. This weeding-out of numerous species in the polar areas, from a fauna which must have much resembled the coral-reef fauna of the present time, accounts for the relatively small number of species which we now find in polar waters, and, through lessened competition, for the relatively large number of individuals belonging to some of these species. In still later times, when polar lands became covered with ice and snow, and when glaciers descended at almost all points into the ocean, shallow water organisms appear to have taken refuge in the deep sea, and a migration of polar animals towards the equator was initiated over the floor of the ocean."*

Although the shorter summer and the longer winter must have undermined the constitution and eventually have destroyed many delicate forms of life,† some, like the Myriapoda, can withstand great alterations of climate. Mr. Sinclair, in the island of Cyprus, found identical species of *Scolopendra* and *Lithobius*

* 'Compte-Rendu,' 3rd Internat. Congr. Zool. Leyden, pp. 109-10.

† Sir Robert Ball has argued that the shorter summer and the longer winter is the cause of the ice age, and not, as is so often thought, a less supply of heat from the sun. According to this authority, and worked on mathematical calculation which admits "of no dispute," of the total amount of heat received from the sun on a hemisphere of the earth in the course of a year, 63 per cent. is received during the summer, and 37 per cent. during the winter ('The Cause of an Ice Age,' p. 90).

not only in the heat of the low country, but also on the top of Mount Troodos, "quite at home among the snow," and as common as in what he imagined to be the more congenial climate.* This gives us some clue to the antiquity and survival of the Myriapoda, fossil remains of which have been found in the Old Red Sandstone of Scotland. That well-known insect belonging to the Thysanura (*Campodea staphylinus*) has been found by Dr. Sharp at midsummer, near the shores of the Mediterranean, in company with the subtropical White Ants, and within a day or two of the same time he noticed it to be abundant on the actual summit of Mount Canigou, one of the higher Pyrenees, where the conditions were almost arctic.† This creature has been supposed to be the nearest living representative of a primitive or ancestral insect. The mountain fern (*Cystopteris fragilis*), "while not objecting to Italian heat," yet flourishes at the base of the Riffelhorn in Switzerland, at the elevation of 9000 feet above the sea.‡

It is necessary to remember that the causes which produced the last glacial epoch are still operative in the present as well as having been so in the past. A long series of glacial visitations consequent on the sequence of natural phenomena is what we must endeavour to visualize. Sir Robert Ball calculates that the intervals between their recurrence may, it is true, be not unfrequently 21,000 years, but the period will often be far greater.§ The mind is appalled with the idea of what a vast destruction of living types, both animal and vegetal, must have taken place during these icy invasions. Many forms doubtless escaped, as we can see by the survivals of to-day, but others must have perished in whole series, leaving not a wreck behind. In the time to come, when the material civilization of Northern Europe will be annihilated under the thick mantle of ice incidental to a new glacial epoch, science in an organized form will watch and record its insidious approach. A zoological literature of the near past will then exist, and species, if destroyed, will be missed, and their obituaries written. The museums and libraries of

* 'Cambridge Nat. Hist.' vol. v. pp. 32-3.

† *Loc. cit.* p. 183.

‡ Hinchliff, 'Over the Sea and Far Away,' p. 261.

§ 'The Cause of an Ice Age,' p. 156.

mankind will then be found further south, but acquired knowledge will not be lost ; the present fauna may be more than decimated, but will not perish unsung. The despised monographer of to-day will have produced the classic of the future, and men will turn to such works as giving the history of the animal life of a long ago. Vast improvement will doubtless be effected in the art and durability of pictorial illustration, and the figures of animals and plants which now exist will be reproduced and preserved as precious relics of a vanished past. We have worked without this material ; who can gauge the nature of the work posterity will produce when possessed of the bricks now produced with such dire travail ? For after all knowledge cannot be forced—it is only slowly accumulated ; the flash of genius frequently illuminates a stage of the road, but the path again darkens, and we plod on. But the next glacial epoch will occur in an historical period, and will explain the action of its predecessors.

(To be continued.)

NOTES ON LAND-BIRDS OBSERVED ON THE NORTH ATLANTIC AND GULF OF ST. LAWRENCE, 1904.

BY JOHN TRUMBULL.

EARLY last autumn I asked a few friends to note down on some forms any land-birds they might happen to meet while crossing the North Atlantic. From material they sent me, and from notes collected by myself, I have brought together the following records. I have adhered to the same plan as last year in giving the distance from land when under two hundred miles in knots, and over that distance by latitude and longitude; and also by noting briefly the weather at the time the record was made. Where there has been any doubt as regards the identity of a species I have placed a query.

I am indebted to Prof. J. Macoun, of Ottawa, for his kindness in identifying some wings; and to Mr. W. Mowat, of the s.s. 'Sicilian,' for verifying some positions and distances.

SAVANNAH SPARROW (*Passerculus sandwichensis savanna*).—March 27th. Bay of Fundy. One seen flying about s.s. 'Tunisian' from 9.30 a.m. to 3.30 p.m. When first noticed we were fourteen miles east of Grand Menan. Clear weather. May 3rd. One seen on same steamer at 10.30 a.m.; one hundred and twelve miles S.E. of Halifax, Nova Scotia. It was caught at 3 p.m., thirty-eight miles south of Sable Island. Fine clear weather. Sept. 15th. Gulf of St. Lawrence, off Heath Point. Two caught on same vessel at 1.30 a.m.; S.W. wind.

THRUSH (sp. ?).—April 23rd. One seen to alight on board at 7.45 p.m. when off Chubucto Head, Nova Scotia, by Mr. Grant Robinson, second officer. It rested for a few minutes, and then disappeared. Moderate N. wind; fine clear weather.

LAND-BIRDS (small).—April 24th. Two seen by Mr. Doyle, fourteen miles N.W. of Cape Sable, Nova Scotia, from 6 a.m. to 8 a.m. Fine weather.

FOX-SPARROW (*Passerella iliaca*).—April 24th. Bay of Fundy.

One caught at 10.40 a.m., ten miles west of Briar Island. Similar weather.

LAND-BIRD.—May 3rd. Off Sable Island. One seen by Captain Whitney. Fine clear weather.

LAND-BIRDS (small).—May 27th. Gulf of St. Lawrence. Three seen by Captain Vipond (s.s. 'Tunisian'). Light N.W. breeze, overcast.

RED-BREASTED NUTHATCH (*Sitta canadensis*).—May 27th. Gulf of St. Lawrence. One flying about ship at 9 a.m. Similar weather.

LAND-BIRD (size of Blackbird).—June 5th. Gulf of St. Lawrence. One seen at 4 a.m. by Mr. E. Cook, chief officer. Another (small yellow) observed at 8.15 a.m. between St. Paul Rock and Cape Ray, Newfoundland. Light S.W. breeze; clear weather.

THRUSH (sp. ?).—June 5th. One seen eight miles W.S.W. of Cape Ray, flying towards the land. Light S.W. breeze, fine clear weather.

WHITE-WINGED CROSSBILL (*Loxia leucoptera*).—July 3rd. Gulf of St. Lawrence, about forty miles N.W. of Bird Rocks. Four flying about ship at 8.30 a.m. Three of them were caught by a member of the crew at 11.30 a.m., two males and one female. Both males were brought to Liverpool alive. Moderate E.N.E. breeze, hazy weather.

SNOW-BUNTINGS (*Plectrophenax nivalis*).—July 29th. Gulf of St. Lawrence, off Fame Point. Two seen by Dr. Crymble, surgeon of s.s. 'Sardinian.' Sept. 26th. One settled on board s.s. 'Tunisian' at 2.20 p.m., one hundred and fifty miles east of Belle Isle. It seemed a very strong bird, and did not remain with us long. Fresh east breeze, fine and clear. 27th. Two seen by Mr. Grant Robinson, second officer of same vessel, at daylight, lat. $54^{\circ} 11' N.$, long. $45^{\circ} 24' W.$ Four more by Captain Vipond at 9 a.m., lat. $54^{\circ} 32' N.$, long. $44^{\circ} 18' W.$ The six still with us at 3.40 p.m., lat. $55^{\circ} 10' N.$, long. $41^{\circ} 41' W.$ One caught at 5.30 p.m. same day. Moderate S.W. to S.S.E. breeze, cloudy weather. 30th. One seen to settle on board same steamer by Mr. Prentice at 1 p.m., one hundred and twenty miles N.W. of Belmullet, the nearest land. It remained with the ship for an hour. Strong N.N.W. gale. Oct. 3rd. Two on s.s. 'Corinthian' when near Belle Isle. Mr. D. S. Campbell, who was a passenger, tells me

they remained with the steamer across the Atlantic to the Irish coast (Oct. 8th). 9th. Mr. Milligan reports that four came on board s.s. 'Sardinian' while passing through the Straits of Belle Isle. This record has been verified by a wing. Light W. and S.W. wind, fine clear weather. On the same day one settled on s.s. 'Pomeranian' at 10 a.m., seventy-four miles from the Irish coast, and remained on board till dusk. Fresh N.W. wind, clear. 11th. One flying round s.s. 'Tunisian' at 9.45 a.m. At noon, lat. $55^{\circ} 14' N.$, long. $39^{\circ} 55' W.$, we had five or six. Moderate N.W. gale. 15th. Mr. Freer reports three joining his ship at noon, lat. $53^{\circ} 23' N.$, long. $43^{\circ} 43' W.$, and remaining till dusk. 16th. Two observed on same steamer one hundred miles east of Belle Isle; both remained till sunset. Mr. R. Bamber, chief officer of s.s. 'Sicilian,' tells me that about a dozen came on board his steamer when passing through the Straits of Belle Isle. They increased in number to about fifty on 19th inst., and then gradually diminished till Bowling (23rd), when the last two disappeared. On same day Mr. J. E. Hodgson tells me he saw five on s.s. 'Ivenia,' lat. $47^{\circ} 41' N.$, long. $43^{\circ} 30' W.$ Two were unfortunately killed, but the remaining three lived till Boston. Mr. Guy Hamilton, chief officer, s.s. 'Ontarian,' reports meeting with five in lat. $52^{\circ} 59' N.$, long. $46^{\circ} 46' W.$ Moderate, fine weather, clear, wind easterly. Next day (17th), at 8 a.m., there were two on board same steamer, lat. $53^{\circ} 34' N.$, long. $40^{\circ} 20' W.$ Light E.S.E. breeze, fine clear weather. 25th. One seen by Mr. G. Smith, fourth officer of s.s. 'Tunisian,' at 1 p.m., lat. $53^{\circ} 31' N.$, long. $49^{\circ} 28' W.$; last seen at 4 p.m. Moderate N.N.W. gale. 26th. One heard calling before daylight, and three seen at 8.15 a.m., lat. $54^{\circ} 57' N.$, long. $41^{\circ} 50' W.$; another at 11 a.m. One seen to fall into water by ship's side at 4.30 p.m., lat. $55^{\circ} 28' N.$, long. $38^{\circ} 14' W.$ Mr. J. E. Stitch, chief officer of s.s. 'Pretorian,' observed one in lat. $56^{\circ} 7' N.$, long. $25^{\circ} 8' W.$; "weather hazy for last three days." Next day (27th) Mr. Stitch met several at noon, lat. $56^{\circ} 7' N.$, long. $18^{\circ} 35' W.$; haze and drizzling rain. One found resting on s.s. 'Tunisian' at dusk, caught at 7 p.m., but was given its liberty next day. 29th. Gulf of St. Lawrence, ten miles S.E. of Heath Point, Anticosti. One on board s.s. 'Sardinian' from 7 a.m. till noon. Fresh S.W. breeze, threatening to snow. 30th.

Mr. Freer reports meeting with three sixty miles east of Belle Isle. They remained with the ship till dusk.

LAND-BIRD (small).—July 29th. Gulf of St. Lawrence, off Anticosti. One seen at noon by Dr. Crymble. Haze; wind S.E.

SWALLOW (sp. ?).—July 29th. Gulf of St. Lawrence, off Heath Point, Anticosti. One seen by same observer at 3 p.m. Similar weather.

LAND-BIRDS (small).—July 30th. Gulf of St. Lawrence, twenty-five miles off Point Rich, Newfoundland. Four seen by same observer. Rain and haze; wind S.E.

LAND-BIRD (small).—July 31st. Gulf of St. Lawrence. One settled on board s.s. 'Tunisian'; it did not remain long. Wind variable, clear.

LAND-BIRD (small).—Aug. 28th. One seen on s.s. 'Tunisian' at 8 a.m. by officers on watch. Fine clear weather; wind S.W. at 10 a.m. Same day another small bird like a Flycatcher was seen flying about and resting occasionally.

LAND-BIRD (size of Lark).—Aug. 29th. One seen flying about s.s. 'Tunisian' by Mr. Smith, fourth officer, one hundred and twenty-one miles E.N.E. of Belle Isle. He did not see it settle. Haze and overcast sky; wind W.S.W.

BARN-SWALLOW (*Hirundo erythrogastra*).—Aug. 29th. One flying about s.s. 'Tunisian' at 5.25 p.m., lat. $53^{\circ} 29' N.$, long. $48^{\circ} 41' W.$ Moderate W.S.W. wind and distant haze. Next day (30th), at 7.10 p.m., in lat. $55^{\circ} 17' N.$, long. $40^{\circ} 06' W.$, one caught, which was probably the same bird. It was alive at midnight (31st), lat. $56^{\circ} 27' N.$, long. $25^{\circ} 20' W.$ 31st. One caught at 4 a.m., lat. $56^{\circ} 02' N.$, long. $34^{\circ} 50' W.$, died at 4.25 p.m. same day. Another at 6 a.m., lat. $56^{\circ} 05' N.$, long. $34^{\circ} 00' W.$

LAND-BIRD (small).—Sept. 2nd. Three observed from same steamer at 7 a.m., one hundred and twenty-one miles N. $70^{\circ} W.$ of Tory Island, Co. Donegal. Another at 1.30 p.m., thirty-five miles N. $53^{\circ} W.$ of same place. Light west breeze, clear weather.

LAND-BIRDS (small).—Sept. 2nd. Gulf of St. Lawrence. Mr. Milligan, chief officer of s.s. 'Sardinian,' observed three distinct species on board from daylight to dusk. Clear day, wind variable.

DOVE (sp. ?).—Sept. 10th. Mr. Guy Hamilton, chief officer of s.s. 'Ontarian,' reports meeting with one at 4 p.m., one hundred and twenty-three miles N. 76° W. of Bull Rock, Co. Cork. Weather fine and clear; wind N.W.

LAND-BIRD (size of Thrush).—Sept. 10th. Dr. Crymble writes me he saw one from s.s. 'Laurentian,' one hundred and thirty-five miles N.W. of Belmullet, Co. Mayo. Clear weather; wind E.

CURLEW (sp. ?).—Sept. 11th. Two flying round s.s. 'Tunisian' at 9 a.m., lat. 56° 22' N., long. 24° 17' W. They remained in the vicinity of ship for fifteen minutes. Hazy weather, with rain; fresh N.E. breeze.

WHEATEAR (*Saxicola œnanthe*).—Sept. 11th. One settled on awning-stretcher of same steamer at 9.30 a.m. for a few seconds, lat. 56° 23' N., long. 24° 31' W. It seemed a very strong healthy bird, and showed no sign of fatigue.

SANDPIPER (sp. ?).—Sept. 11th. One flying some distance off same steamer at 12.18 p.m., lat. 56° 33' N., long. 26° 07' W.; clear.

PINE WARBLER (*Dendroica vigorsii*).—Sept. 15th. Gulf of St. Lawrence, off Fame Point; one caught at 9.30 a.m.

LAND-BIRD (large).—Sept. 18th. Mr. Milligan observed one keeping with s.s. 'Sardinian' at 7 a.m., thirty-seven miles off the Irish coast. Light W. and S.W. wind; fine clear weather.

LAND-BIRDS (small).—Sept. 24th. Gulf of St. Lawrence, seven miles south of Heath Point, Anticosti. Mr. A. Freer, second officer of s.s. 'Pomeranian,' tells me that several small birds like Wrens were about his steamer at 5 a.m. They remained on board about six hours, and disappeared as the ship drew near Cape Whittle.

RUBY-CROWNED KINGLET (*Regulus calendula*).—Sept. 24th. One came on board with last species. Identified by wing and crest sent me by Mr. Freer. Oct. 29th. Another noted by same observer ten miles S.E. of Heath Point, Anticosti.

WOODPECKER (sp. ?).—Sept. 24th. Gulf of St. Lawrence, seven miles south of Heath Point, Anticosti. One observed at same time as first Kinglet.

HAWK (sp. ?).—Same day, twenty miles south of Little Mecatina, Gulf of St. Lawrence. One settled at 3 p.m. on crosstrees

of foremast of same steamer, and rested half an hour, and then disappeared. Fine and clear; moderate S.W. breeze.

LAND-BIRD (small brown).—Same day, forty miles S.W. of Point Rich, Newfoundland. One came on board same steamer at dusk, and probably remained till daylight. Fine, but dull; moderate S.W. breeze.

LAND-BIRDS (small).—Sept. 25th. Gulf of St. Lawrence. One seen by Mr. Grant Robinson, second officer of s.s. 'Tunisian,' at 5 a.m. Two seen by same observer between 2 p.m. and 4 p.m. Early morning foggy, wind E.; weather clearing at 4 p.m.

DUCKS (sp.?).—Sept. 29th. Two flying west at 10.30 a.m., lat. $56^{\circ} 36' N.$, long. $23^{\circ} 31' W.$; fresh N.N.W. breeze, fine weather.

SNIPE (sp.?).—Sept. 30th. Two seen flying about ship by Captain Vipond and Mr. Robinson, one hundred and ninety-nine miles N. $75^{\circ} W.$ of Tory Island. Strong westerly gale, fierce squalls.

GREATER REDPOLL* (*Acanthis linaria rostrata?*).—Oct. 9th. Three settled on s.s. 'Sardinian' while passing through the Straits of Belle Isle en route for Glasgow. Mr. Milligan, who sent me a wing, writes that "one of the three came across with us." N.W. wind; fine clear weather.

LAND-BIRD (small).—Oct. 14th. Straits of Belle Isle. One seen by Mr. Guy Hamilton at noon, twenty-two miles off Cape Whittle. Cloudy weather; wind N.E. 15th. Two more seen by same observer at 4 p.m., eighty-four miles east of Belle Isle. Light northerly wind; fine clear weather.

LAND-BIRDS (small).—Oct. 14th. Gulf of St. Lawrence, near Heath Point, Anticosti. Four or five seen by Captain Vipond at 7.30 a.m.; another at 10 a.m. Moderate N.N.W. breeze, clear.

THRUSH (probably American Robin).—Oct. 23rd. Gulf of St. Lawrence, off South Point, Anticosti. One seen by officers on watch ('Tunisian'). Wind S.; foggy weather.

SLATE-COLOURED JUNCO (*Junco hyemalis*).—Oct. 23rd. Gulf of St. Lawrence, off Anticosti. Mr. Grant Robinson drew my attention to one hopping about the decks at 12.35 p.m. It

* Professor Macoun has examined a wing, but is not quite satisfied with his determination.

remained with the ship till 4.30 p.m. Dense fog from noon onwards.

STARLING (*Sturnus vulgaris*).—Oct. 27th. Mr. J. E. Stitch, chief officer of s.s. 'Pretorian,' reports meeting with one at noon in lat. $56^{\circ} 7' N.$, long. $18^{\circ} 38' W.$ Haze and drizzling rain; light easterly wind.

LAND-BIRD (small).—Oct. 27th. Three seen by Mr. Grant Robinson at 12.30 p.m., lat. $56^{\circ} 15' N.$, long. $30^{\circ} 05' W.$ Fine clear weather.

LAND-BIRDS (several species).—Oct. 29th. Gulf of St. Lawrence, ten miles S.E. of Heath Point. Mr. A. Freer reports several on board his ship from 7 a.m. till noon. They suddenly disappeared when thirty-four miles from Cape Whittle, the nearest land. Three wings received were identified by Prof. J. Macoun, of Ottawa, as Redpoll (*Acanthis linaria*), Pine Siskin (*Spinus pinus*), Tree-Sparrow (*Spizella monticola*). Fresh S.W. breeze; threatening snow.

LAND-BIRD (small).—Oct. 29th. Two seen by Mr. J. Fortune from s.s. 'Tunisian' at 11 a.m., fifty-four miles N. $77^{\circ} W.$ of Tory Island. Wind variable.

LAND-BIRD (like Common Snipe).—Nov. 1st. Mr. Guy Hamilton reports meeting with one at 8 a.m., fifty-eight miles S. $89^{\circ} W.$ of Bull Rock, Co. Cork. Light N.E. breeze; fine and clear.

LAND-BIRDS (like Chaffinches).—Nov. 2nd. Same observer reports four or five at noon, lat. $52^{\circ} 31' N.$, long. $19^{\circ} 23' W.$ Moderate W.S.W. breeze and cloudy weather. 3rd. Two still on board at noon, lat. $53^{\circ} 13' N.$, long. $25^{\circ} 55' W.$ Moderate westerly breeze.

LAND-BIRDS (size of Blackbirds).—Dec. 18th. Sixty miles off Nova Scotia. Three observed keeping with s.s. 'Sicilian' for few minutes. Moderate N.N.W. wind; hazy.

These notes may be looked upon as showing, in a very small way, the number of birds which are seen yearly on the North Atlantic, and Gulf of St. Lawrence. Probably, if they were multiplied by forty or fifty times, they would be still far short of the number that wander out to sea.

It will be seen that the Snow-Bunting is the most frequent bird met with, and that it occurs in considerable numbers, and

over a wide area of the Atlantic, in September, October, and November. There is no doubt that the majority of them are young and inexperienced birds, but that a fair number are mature ones, probably carried out to sea by strong gales. It seems strange that the Wheatear should be met with in much the same part of the Atlantic for the last three years, unless it is able to fly direct from Greenland to the north coast of Ireland, a distance of over eleven hundred miles.

The American Barn-Swallow may have wandered across and escaped notice, as one lived on board the s.s. 'Tunisian' to within five hundred and fifty miles of the Irish coast. Those who have Swallow skins in their possession should examine them for this species. Further investigation will probably show that many other species occur, and that most of our American visitors to this country have been assisted chiefly by steamers from the St. Lawrence by way of Cape Race and Belle Isle.

ON A NORFOLK HERONRY.

BY A. H. PATTERSON.

NINE miles to the south-west of Great Yarmouth, on the north side of the River Yare, lies the large but scattered village of Reedham, so named, it is supposed, from the great quantities of reeds that formerly characterized the adjacent lowlands; and made somewhat important by reason of its being constituted a "junction" by the Great Eastern Railway. It was here, too, that Lodbrog the Dane is said to have been slain by the jealous Berne, the Saxon king's huntsman.

To me the greatest interest attached to Reedham is the fact that a flourishing colony of Herons is established there, and, after a long-determined intention, I at length paid a hurried visit to it on the hot sultry afternoon of July 15th of the present year. The heronry may be easily seen from the window of the train just as it enters the outskirts of the village, although the unsuspecting might pass and re-pass it many times without a knowledge of its existence. At intervals along the route the lumbering flight of a passing Heron may be noticed, or some member of this colony may be seen thigh-deep in a Breydon "run," watching for a lunch of Eels; and now and again another, scarce troubling to look at the snorting engine ahead of us, stolidly eyes the ditch he stands in, hoping for the coming of some Vole or Stickleback, for he knows the monster to be harmless as far as he is concerned.

The Reedham heronry is situated about a mile from the station, on Mr. Stimpson's estate, in a wooded "carr," on rising ground where the marshes commence, and is reached by a round-about roadway, made lively for the pedestrian at this season by the onslaught of flies, which seem to be awaiting his coming in the tall nettles that forefront the thickset hedges, and where the Meadow-Brown butterflies start ahead at his shadow.

I was fortunate in finding Mr. Pearson, the steward, immediately on entering the farm premises, and was made

noisily welcome (?) by a brace of chained dogs belonging to a well-known circus proprietor. It was but a short ramble from here to the heronry; the harsh cries of some of the birds betokening that several of them were as yet at home. Pearson, a most intelligent and interesting man, and who seems justly proud of the birds, pointed out, as we strolled along, a turnip-field most woefully suffering from the "canker"; on every leaf, or remnant of it, were numbers of small green larvæ,* with curiously pointed posterior, and which skipped about in a most excited manner on a sheet of paper when touched, in that lateral wriggling fashion assumed by a chopped worm, but infinitely more quickly. At the time of writing I am informed that my old friends the Starlings are now after them by thousands, but the pests are so widely distributed in Norfolk this year that irreparable damage will be done the farmers. On the field mentioned a hundred and forty Herons have at times assembled.

As one enters the closely packed clump of tall Scotch firs and somewhat attenuated ashes, he is greatly impressed by the luxuriant growth of the reeds and bracken that, often together, crowd beneath them, the fronds of the latter shoulder-high in places; whilst beautiful ferns, tall vicious nettles, and sprays of red campion abound, and hundreds of red-ripe wild raspberries invite him to pluck and taste them. The height of the trees and their thickly bushed tops attract attention, as also does one ancient fir, standing in their midst dead and decaying—a barked, scarred, and punctured skeleton; you feel something akin to pity as well as interest in the old thing, which seems ready to totter and fall, but the sturdy survivors, clustering around it, ward off the evil day, and screen it from every wind. In that dead tree more interest seemed centred than in all those living; it had died of sheer old age, and was now a happy hunting-ground of the Lesser Spotted Woodpecker. The droppings of the Herons had not killed it, or why had it suffered alone? The thickly growing undergrowth had caught much of the Herons' excreta before any of it had touched the earth beneath it, and, far from suffering, grew the more rankly for it. There was "an

* I forwarded several of them to Mr. H. J. Thouless, of Norwich, with whom they pupated; he has since informed me they were the larvæ of a small moth (*Plutella cruciferarum*). It is a very distinctive species.

ancient and fish-like smell" in the air that tickled the nostrils somewhat, but not offensively, although the bailiff assured me "there was something in it" after a heavy shower of rain.

Kestrels were here in plenty, and the keen-eyed hawks dashed into the open with emphatic and shrilly cries of "kee, kee, kee!" at our approach. "Yor don't kill the Kestrels?" I asked of Pearson. "No, I do not," he replied; "they are far too useful." A remark that spoke much for his forbearance and common sense.

Wood-Pigeons, too, "flip-flapped" away from their slovenly nests, leaving their low-built, loosely-stacked bundles of faggots in hot haste; in one instance I saw the greater part of an egg showing between the foundations.

In a few moments we came under the Herons' nests, which needed no pointing out, for such huge constructions, although by no means carelessly built, and with several occasionally adorning a single tree, stood out boldly between my binoculars and the sky; and in the few open spaces between the topmost boughs old birds might be seen wheeling around on light strong wing, in a manner by no means ungraceful, and altogether different from that heavy lumbering flight one notices as fishing birds move from one Breydon "drain" to another, or when lazily winging their way over the marsh ditches. The familiar "frank!" was repeatedly uttered, and an occasional deeper bass "trouk!" betrayed anxiety and a note of warning. Some nest had probably and unwittingly been bereft of a younger tenant; while presently we found our surmise correct, for we came across a young Heron, full-feathered but unable to fly, who at our approach, scared and excited, played a clumsy game of leap-frog with the bracken he as often blundered through. We let him go; his parents would have found it awkward to drop through the tangled branches to come and console him, but there can be no doubt he will find enough food thrown down to him, perhaps unintentionally, to keep him going until he dares venture out to the neighbouring ditches to hunt for himself.

Only a few young Herons remained in their nests; the majority of these, indeed, sat or stood just outside them. We noted that they were well-feathered, and all but ready to follow their elders to their daily war upon the Frogs and Voles and fishes

But such bundles of faggots were these high-perched nests ! Some of them would well-nigh have filled a wheelbarrow. On one large ash-tree there must have been over a dozen, and the whole ninety and more of them were so closely built that you might have sat in the central one, and easily have pitched its eggs into the furthest nest. And this is the heronry, in the very wood wherein, three hundred years ago, Sir Thomas Browne also saw the Spoonbills nesting ! I felt like taking off my hat, for the place seemed hallowed by associations, and venerable in its history.

The Herons are looked for every year, "reg'lar as a clock," on Feb. 1st ; their call is heard for the first, the bailiff assured me, on that date at about eight in the evening ; so punctual are they on their return. On April 1st young ones are heard "twipping" in the nests. The young ones in early summer keep much in the vicinity of the wood, using that side most sheltered from the wind. The Frogs, Water-Voles, Sticklebacks, and other creatures in the neighbouring moist places then pay heavy toll. At pairing-time there is much ado in the tree-tops, and squabbles are not infrequent ; and no wonder, when they begin to set up establishments as close to each other as houses in a Yarmouth "Row." In August they all go, and find fresh pastures. Some, no doubt, take a trip to the Continent, a procedure as fashionable with birds as men.

It was made pretty plain, too, where there were nests overhead, by the big area of white-splashed plants below. A score of angry and inebriated whitewashers could not have flung their trade-marks half so effectively ; it seemed to have rained excreta ! And lying around in the thinner clad places, and under the bracken, were many pellets, mostly the size of ducks' eggs. I noticed these in hundreds when brushing aside the herbage in order to discover any fish that might have fallen, but in this search I was not fortunate ; I certainly picked up a three-inch tail-end of an Eel, brown, frayed, and evil smelling. It had evidently been thrown up by an overfed or excited youngster. Two of the pellets I took home with me, and pulled to pieces ; they smelt like decayed mushrooms. They were hard to disintegrate, being closely matted, and had much the appearance, when torn, of black cotton-wool ; I found them composed almost

entirely of the fur of the Water-Vole, with a few broken, brittle teeth and fragments of skulls, that crumbled somewhat easily between the fingers. I warrant the Herons destroy thousands of Water-Voles in the course of a season. In one pellet I found cream-white maggot-like larvæ, probably of some beetle, and many minute insects, that on white paper could, by the aid of a powerful lens, be distinguished as a microscopic beetle much resembling a Staphylinid.

Mr. Pearson remarked that the Herons did now and again drop small Eels, running up to half a pound, and sometimes a few small fresh-water fishes; he had found half a small Jack, and a Trout weighing at least a pound, but never had discovered a flat-fish, which is curious, seeing that in certain seasons when, like the present one, Eels are not plentiful, and Flounders have to satisfy them when fishing on Breydon. I saw early in July six young Herons busy on Breydon, capturing little Flounders.

For neighbours the Herons have the Kestrels and Wood-Pigeons, and this season a pair of Carrion-Crows. These the bailiff said were shy, wary, and silent; they seemed to know they bore the mark of a sable Cain; they allowed of no near approach, but glided out of their nest like black spirits, noiselessly and speedily, and kept away until the coast was clear again. Rooks numerously nested there also, and as many as five hundred young ones were shot each season, and Jackdaws too had a few nests in the neighbourhood. Reedham heronry, then, is by no means a lonely spot in birddom.

All the time we were chatting and brushing through the bracken—an hour at least—various species of moths took to wing at our approach; but not so the flies, which buzzed around our heads by hundreds: our hats were beehives by comparison! The odour prevalent must certainly be sweet to them, and no doubt they find the undergrowth a happy hunting-ground; and they either welcomed us or protested—I thought they did a great deal of both—and but for decorating the eaves of my hat with a festoon of brake-leaves, the torture—to me, at any rate—would have been unendurable; my friend seemed on better terms with them. They left us, however, when we ourselves came out of the “carr,” and in a very short time I left my most communicative friend to hurry to the train, thanking my lucky star that

my "name and fame" had preceded me, and had acted as an "open sesame" to the good man's store of Heron-lore.

On arrival home I opened Mr. Southwell's dainty volume on 'Natural History' by Thomas Browne, and could but help wishing that his remark, "The great number of riuers riuulets and plashes of water makes hernes and hernerics to abound in these parts," held good in its entirety to-day. But to see such a goodly heronry as that at Reedham was an experience far from uninteresting; and I endorsed his further remark respecting "yong hensies being esteemed a festiuall dish and much desired by some palates," for I certainly prefer to Wild Duck the carcase of a juvenile Heron that has not yet grown rank by living long enough on a diet of fishes and other flavouring creatures.

NOTES AND QUERIES.

MAMMALIA.

The Flight-time of the Noctule (*Pterygistes noctula*).—In a paper dealing with the habits of the Noctule (Zool. 1901, pp. 51-59), I expressed an opinion that the period of activity in this species is limited to a vespertinal flight of from one to two hours. From this opinion my friend Mr. J. Steele-Elliott (*tom. cit.* p. 153) and others dissented at the time, and more recently Mr. C. B. Moffat, in his interesting paper entitled "The Duration of Flight among Bats" ('Irish Naturalist,' 1905, pp. 97-108), arguing from the analogy of the closely allied Leisler's Bat and from his own limited experience of the Noctule, has also shown that I was wrong. Although it is beyond question that the Noctule has a matutinal flight, Mr. Moffat's observations, as well as my own, suggest that fewer individuals are abroad at dawn than in the evening twilight. I do not know of any precise observations on the time of the Noctule's exit and return in the early morning, or of the duration of the morning flight, and give my own experience with some diffidence, as it is limited to a single occasion. The Noctule abounds in the wooded Cheshire Plain, but, as its dens are usually high up in the branches of trees, it is obviously impossible in most cases to observe the Bats, even in bright moonlight, as they return from their evening flight, or leave the hole again in the early morning, and nothing can be done unless one is so fortunate as to find a den in a trunk or leafless branch which shows clearly against the sky, and is at the same time at no great height. A den about twenty feet from the ground, in a dead limb of a beech in Oulton Park, near Tarporley, furnished a fairly good subject for observation on the moonlight night of May 20th. When I reached the place at 7.40 the Bats were squeaking in the den, and continued to do so at intervals until 8.25 (eighteen minutes after sunset), when four left the hole in rapid succession, followed a few seconds later by four more, and then by two. None was heard nor seen until 9.24 (seventy-seven minutes after sunset), when one returned and dashed round the tree and among the dead branches. During the next twelve minutes others followed, though it was impossible to tell how many, and there was intermittent squeaking

in the den until ten o'clock, but no Bat entered or left the hole after 9.36. From ten there was a slight squeaking in the den at long intervals until 2.40 (eighty-five minutes before sunrise), when the noise increased, and more than one Bat emerged—in the gloom I could not tell the exact number—and all was still until 3.20 (forty-five minutes before sunrise) when three returned. These dashed round among the branches, alighting on the trunk at the mouth of the hole once or twice, and then dashing away again before entering the den, as *Noctules* generally do on returning from the vespertinal flight. There was no squeaking after the Bats entered the den, and I heard none until 4.2, when I left the tree. On the evening of July 12th I went again to Oulton, but was disappointed to find that the *Noctules* had vacated the tree; at any rate, I neither saw nor heard any between 8.20 p.m. and 2.35 a.m. I then went down to the mere, but, although at 2.45 I could see several Daubenton's Bats skimming over the water, it was too dark to make out any *Noctules* which may have been hawking overhead. At 3.3, when it was fairly light, I saw one, and from then until 3.47 (thirteen minutes before sunrise), when the last disappeared, several more, though not nearly so many as one may see flying over the mere on any summer evening.—CHARLES OLDHAM (Knutsford).

Daubenton's Bat (*Myotis daubentoni*) in Denbighshire.—Little is known as yet of the distribution of Daubenton's Bat in Wales. It may therefore be of interest to record that on the evening of June 13th last I watched several examples skimming in their characteristic fashion over a quiet reach of the Elwy, just above the bridge at Llanfairtalhaiarn.—CHARLES OLDHAM (Knutsford).

Lesser Horseshoe Bat (*Noctilio hipposideros*) in Shropshire.—On July 6th, 1904, a specimen of this Bat was flying around the hall of my house; it had evidently entered through the open doors, and on my approach with a light it became dazzled, and enabled me to capture it. This is the first record of this species for Shropshire, and it is now in the Worcester Museum. It is evidently an uncommon species in this neighbourhood, as since then I have been unable to procure any additional specimens.—J. STEELE-ELLIOTT (Dowles Manor, Shropshire).

Winter Whitening of the Stoat in Britain.—In 'The Zoologist' for 1904, p. 190, I see that Capt. G. H. Barrett-Hamilton asks any naturalist to add to the evidence which he already possesses as to the preponderance of female Stoats among the instances of winter whitening. In January of this year I got two very beautiful specimens near here, each

of which had a slight splash of brown only on the forehead. One was a trifle yellowish white. "Both were females and rather old," said Messrs. Pratt, of Brighton, who set them up for me. One of these Stoats is now included in the magnificent collection housed in Norwich Castle. I am glad of having an opportunity of recording the occurrence of these white Stoats so far south, and during such a comparatively mild and snowless winter as we enjoyed. — H. MARMADUKE LANGDALE (Compton House, Compton, Petersfield, Sussex).

Mus flavicollis in Suffolk.—On July 25th our Cat (now twelve years old) brought in a very fine female specimen of this Mouse, measuring quite eight and a half inches in total length. The weather was so hot at the time that I did not send it away, though it is the first I have seen for more than a year, but gave it to the Tawny Owl (*ante*, p. 264), whose enjoyment of the dainty morsel seemed to be intense. — JULIAN G. TUCK (Tostock Rectory, Bury St. Edmunds).

AVES.

Nesting of the Dartford Warbler (*Sylvia undata*) in Sussex.—On May 24th, while in Ashdown Forest, Maresfield, Sussex, I discovered the Dartford Warbler among the gorse-bushes on Camp Hill, and judging by the movements of the bird that its nest was near, commenced a search, when my brother, who was with me, drove off the female and found the nest, containing four eggs. Visiting the nest on June 16th, I found an addled egg in it, but failed to see anything of the young birds, though they must have been close at hand, if I may judge by the conduct of both the male and female. — ROBERT MORRIS ("Fernhurst," Uckfield).

Breeding Habits of the Great and Blue Tits.—I should be much obliged to any of your readers who would give me particulars of any instances in which a second brood has been reared after the first has flown in the case of either of these species.—F. C. R. JOURDAIN (Clifton Vicarage, Ashburne, Derbyshire).

The Red-backed Shrike (*Lanius collurio*) and its Prey.—This is an abundant species around this neighbourhood, several pairs nesting not far distant from my house. One pair that have reared their young close to my garden have given me an opportunity in my brief daily observations of noting to what extent this species is destructive to the young of other birds. In the first instance, some few weeks ago I noticed the male Shrike flying over the house with a young Long-tailed Tit in its claws; this it had evidently killed from a family party in a

plantation close by. It flew into a larch-tree some fifty yards distant, and thirty feet upwards, and not until I had thrown at it three times would it let fall its prey. It had been killed, as seems usual, by the back of the skull being crushed in. The following evening it captured the young of another bird, but I was unable to find it after being dropped into the undergrowth. Immediately afterwards I prevented a young Yellowhammer being killed, which it had buffeted to the ground a short distance from where I was working. Again, a young Pied Wagtail that had evidently left its nest but a short time previously and had flown on to the lawn was swooped upon immediately my back was turned and killed. The cries of the parent birds, joined by a pair of Flycatchers and a Grey Wagtail, attracted my attention to the Shrike and its victim, and, replacing the Wagtail, the Shrike immediately returned, and succeeded in flying with its proportionately very heavy load some short distance away, and over a hedge several feet high; and, although still mobbed by the various birds, devoured the greater part of the Wagtail's head before I again disturbed it for further examination; replacing it, the Shrike evidently again returned in my absence, and removed its prey away from further observation. In a previous year I found an adult Goldcrest impaled on a hedge near by, but this is the only instance I can recall where I have known any bird so treated. An instance was reported to me this year, in Bedfordshire, of a Shrike swooping upon a young Pheasant poult close to the coops. I have never witnessed any bird being attacked except by the male Butcher-Bird.—J. STEELE-ELLIOTT (Dowles Manor, Shropshire).

Albino Starling in Suffolk.—On June 12th a perfectly white Starling was shot in the adjoining parish of Beyton, and brought to me on the following day. It was a young bird, which had been out of the nest for perhaps a week, and a genuine albino with pink eyes.—JULIAN G. TUCK (Tostock Rectory, Bury St. Edmunds).

Egg-depositing by the Cuckoo (*Cuculus canorus*): an Explanation. I have to explain, in reference to my notes on this subject, that the bird which we call here the "Heather Linnet" is supposed to be the Meadow-Pipit (*Anthus pratensis*) of Macgillivray; subject, of course, to further inquiry. The local name is perfectly appropriate, as the bird is practically confined to the moors; and the question now turns upon which is the most common bird which the Cuckoo depends upon for the rearing of its young. There are many birds here in the nests of which the Cuckoo elsewhere is known to deposit its eggs. This Pipit apparently varies a good deal over the area of its distribution. It is

said by the author quoted to be anteriorly tinged with red in the lower parts; it frequents moors, &c.; but he does not mention mountains, but states the nest is usually placed on a grassy bank, &c. It is usually among or about heather here. "The eggs usually five; two broods are reared." Here there are usually four eggs, seldom five—very rarely so; only one brood. In the case of his Mountain Linnet or Twite (*Linota montium*), he says that it is abundant in the northern part of Scotland, &c., where it remains all the year. It becomes less common as we proceed southward. No mention is made of its occurrence in England. A reader of 'The Zoologist' wrote to me from the North of England to say that he had found this bird acting as foster-parent there. It must be noted that Macgillivray does not refer to its occurrence there, and it will be very interesting to have this corroborated. The mention of the nesting habits seems more akin to what I see of the Meadow-Pipit here than that given of the latter bird, as regards situation, at any rate.

Egg-depositing of the Cuckoo in 1905.—I again find that the Mountain or Hill or Heather Linnet, or "Lintie," as we call it here, but which must be known as or associated with the Meadow-Pipit (*Anthus pratensis*), is the only one which I see acting as foster-parent. I have been made acquainted with two nests, in which the eggs were seen. In the one case there were four eggs of the foster-parent and one of the Cuckoo. In the other case there were also five eggs, two of which were Cuckoo's. There were two young Pipits and one young Cuckoo, leaving two addled eggs, that of the Cuckoo being a pretty large one. They were left where Rats got hold of them. These increasing quadrupeds (Brown Rats) had a representative who found the way to the ejected young birds at the vicinity of the nest, and one night, as two of my servants were taking home my horses, they saw a Brown Rat with one of the young in its mouth. They gave chase, but the Rat succeeded in getting into a hole. The young Cuckoo got on all right, and evidently had reached the leaving of the nest stage. There are very many young ones chirping about here just now, so that there has been a prolific hatching season.—W. WILSON (Alford, Aberdeen, N.B.).

The Sounds produced by the Long-eared Owl (*Asio otus*).—As a contribution to the discussion on the sounds uttered by the Long-eared Owl, I append an extract from my note-book dated May 20th, 1903:—

"Last night about nine o'clock, when I was riding past a covert at Lower Peover, I heard the discordant creaking note of a young

Long-eared Owl—strikingly like a gate swinging on unoled hinges.* I went into the covert, and made out that the noise was coming from a tree, and also from on or near the ground; but when I got close to the spot whence the sound seemed to come it ceased, and I could find nothing. To-night I went to the place at eight o'clock, and soon found a Long-eared Owl in down with incipient ear-tufts. The primaries were showing, but the bird was quite unable to fly. It was sitting on a branch of a small dead fir, about four feet from the ground, bolt upright, with wings and downy feathers pressed close to its body, and looked in that position very attenuated. The toes were two and two, on either side of the branch. When I touched the bird it hissed like a swearing Cat, snapped its mandibles, making quite a loud noise, and attempted to bite. It then lowered its head, arched its wings so that the secondaries met above its back, and spread the primaries on either side, presenting the whole upper surface of its wings to the enemy, and so increasing its apparent bulk very considerably. At the same time it puffed out its body-feathers, and snapped and hissed. It did not wag its head as an angry Barn-Owl does, but remained rigid for some seconds. This attitude, which is no doubt a terrifying one, was assumed whenever I touched or alarmed the bird. About thirty yards from the tree on which the young bird was, I found the nest in a Scotch-fir, some thirty feet from the ground—apparently an old Sparrow-Hawk's nest had been utilized—and on it was a second young bird standing bolt upright. Beneath the tree and one near it were many pellets, and the wings attached to the plucked body of a Swallow.

“A clamorous crew of Blackbirds and Song-Thrushes, with at least one Mistle-Thrush among them, was in the meantime mobbing one of the old Owls, chasing it from fir to fir in the covert. About 8.30 the birds stopped mobbing the Owl, which then came into a fir near the nest, and called loudly ‘woof, woof, oo-ack, oo-ack, oo-ack.’† The Thrushes never molested it after I first heard it call, but sang in the trees, some of them close to the nest, for some time. The old Owl, from 8.30 until 9.15, when I left, was constantly calling ‘oo-ack, oo-ack,’ both when perched and when on the wing, but I only heard the barking ‘woof, woof’ once or twice after the initial cry. Just about the time that the old one began to call, the young ones started

* This note, which I take to be the hunger-cry of the young, is a familiar sound in our local fir-woods in spring; it is Mr. Gyngell's Sound No. 2, which he writes “kyiark” (*ante*, p. 183).

† These are possibly the barking or “quacking” noises alluded to by Mr. Howard Saunders ('Manual of British Birds,' 2nd edit. p. 294).

their monotonous creaking cry, and the one near the ground became much more lively, climbing clumsily among the branches, but, so far as I could see, not using its beak to help it in so doing. The old bird frequently came into the tree just above where I was standing near the young one, calling loudly, and obviously resenting my presence. Whether the young bird had left the nest voluntarily or had fallen out, the old one was evidently looking after it, and was no doubt feeding it as well as the one in the nest. The facial disc of the young bird was black; primaries blackish brown; iris deep yellow.

“Pellets gathered at the foot of the nesting tree yielded skulls of Field-Vole, Wood-Mouse—no Shrews—Buntings, Finches, and a soft-billed bird, apparently a Robin or a Hedge-Sparrow.” — CHARLES OLDHAM (Knutsford).

Sounds produced by Owls.—I am interested in this subject, and, without occupying too much space of your valuable and dear old *Maga*, I shortly desire to say I can corroborate *almost* every word written by your correspondent, Mr. C. H. Bryant, as regards each of the species mentioned (*ante*, p. 265), though, just as *different people's* appreciations of sounds *differ*, I might use other terms to express these several sounds. That, however, seems to me a “science” not reduced to *School Board level yet*, and as one still leaving some blessed opening for originality. I cannot, however, speak to the “snoring” sound of *old Barn-Owls*. The “kee-yak” I have *often* heard the *old Barn-Owl* give voice to, *within twelve inches of my ear*. At that time, and on these occasions, he had perched on the outside sill of my bedroom window, and invariably it denoted a *ghastly triumph*, because in his claws he held a still writhing or palpitating “small deer,” usually a Field-Mouse. I cannot affirm that the “kee-yak” regularly issues from the Tawny's throat, but, unless I was greatly deceived, I several times believed that such a sound emanated from a much bigger Owl—the Eagle-Owl—only different in pitch a little—which birds I kept in confinement for a term of years; at least his bill was open when I heard the weird shriek, and there was no “boom” in it. But perhaps Mr. Gurney might enlighten me on that point; to him I was indebted for one of the two birds I had—a small male. The hen was taken from the nest in Norway in 1871. I believe the latter may still be alive at Dalnaglas, Glen Shee; if so, I would be pleased to hear of her welfare. J. A. HARVIE-BROWN (Dunipace, Larbert, Stirlingshire, N.B.).

Rock-Doves (?) Nesting in Rabbits' Holes.—*This is a common habit of the Stock-Dove*, which is not the parent form of our domestic “Doo,” as I believe the Rock-Dove—which *usually nests in cairns* both on the *Zool. 4th ser. vol. IX., August, 1905.*

west and east coasts—*is*. At Craighall, not only do Jackdaws occupy holes on the cliffs, but the Stock-Dove does so also; and that from an early date in the chronological history of the species in Scotland.—J. A. HARVIE-BROWN (Dunipace, Larbert, Stirlingshire, N.B.).

I HAVE just read the note by Prof. McIntosh (*ante*, p. 268) concerning the finding of two young Pigeons of doubtful parentage in a Rabbit-burrow at Nevay Park, Forfarshire. Prof. McIntosh suggests that these were probably young Rock-Doves. If this is not a misprint for Stock-Dove (which was the conclusion I first came to on reading his note), may I suggest the latter bird as the probable solution of the mystery? The Stock-Dove is well known to nest in Rabbit-burrows in the neighbouring county of Fife.—B. B. RIVIERE (Flaxley, 82, Finchley Road, N.W.).

Do Partridges Migrate?—In response to Mr. A. Patterson's request (*ante*, p. 186) for notes *re* migrating Red-legged Partridges, the following may be of interest:—A bird of this species was seen to fly in from the sea on April 4th, 1896, and alight in an exhausted condition on the east pier, where it was captured alive. Another was seen coming in from the sea in the South Bay. When about one hundred yards from the shore it dropped exhausted in the water and washed ashore. This occurred on March 22nd, 1897. A third example of the same species was picked up dead, but quite fresh, floating in the sea near Hayburn Wyke, nine miles north of Scarborough, on March 17th, 1879. I saw all three specimens.—W. J. CLARKE (44, Huntriss Row, Scarborough).

The Great Crested Grebe (*Podiceps cristatus*) in Scotland.—I am glad to be able to say that this bird is slowly but surely extending its range in Scotland. This year I saw three pairs of these interesting birds on the Lake of Meuteith (Perthshire), and found two nests, the one containing two and the other three eggs. I had not time to examine all the reed-beds, or I might have found more of them. There is also one sheet of water in Renfrewshire where I know they breed annually, and possibly there are more.—T. THORNTON MACKETH (The Hall, Caldwell, Renfrewshire).

Notes on Nest-Boxes.—Our nest-boxes have during the past season been occupied by Great Tits, Blue Tits, Nuthatches, Tree-Sparrows, Starlings, and one pair of Stock-Doves. For the first time I have not had a single box taken by House-Sparrows, which seem to have given way to the Tree-Sparrows so far as the boxes are concerned, and of the latter I have had quite a dozen nests. If any moss is used in the

building of a Sparrow's nest in a box, it is pretty certain to be that of the Tree-Sparrow, and clutches of six eggs are far more frequent with this species than with its larger relative. A pair of Spotted Flycatchers built a very pretty nest on the lid of a box, but so far as I know no eggs were laid, and we had a Pied Wagtail's nest in an old water-can in ivy on a wall, which hatched off all right. One of my correspondents in Lancashire begged for a clutch of Nuthatch to put under a Tit, and of seven eggs I sent him five were hatched out by a Blue Tit. He tells me the young birds went off all in good time, and it will be interesting to know if they breed in that locality next year. I have not seen a Redstart or a Redstart's nest this season; they have occasionally come to the boxes, and a boy working in the garden told me in all good faith that he had seen a Nightingale go into a box, which, it is almost needless to add, was a hen Redstart. One of our prettiest summer migrants, the House-Martin, is certainly on the increase here, and I always endeavour to keep alive the old superstition that if the Martins' nests are disturbed it will "bring bad luck to the house."—JULIAN G. TUCK (Tostock Rectory, Bury St. Edmunds).

AMPHIBIA.

The Natterjack Toad (*Bufo calamita*) in Bedfordshire.—Jenyns, in 1835 ('Manual of British Vertebrate Animals'), spoke of this Toad as met with in plenty on Gamlingay Heath, in Cambridgeshire, which was about a mile from the border of Bedfordshire, and which similar tract of country extended as far as Sandy, some five miles distant. A few years later almost the whole of this heath-tract of country was broken up and brought under a high state of cultivation, which it was thought involved the extermination of this amphibian. Prof. Alfred Newton, however, kindly informs me that it is still known and survives at Gamlingay, though restricted to a very few spots, in its old haunts. On June 16th last, late in the evening, I met with a single specimen near some water-holes of a sand-pit, in the parish of Sandy, and on the following day found this species fairly abundant in what was evidently their spawning haunts. Examination of the excrement of several taken at the time consisted partly of the wing-cases of smaller Coleoptera, including the ladybird-beetle, but in confinement worms, caterpillars and other larvæ, woodlice, earwigs, and insects generally seem to be readily taken.—J. STEELE-ELLIOTT (Dowles Manor, Shropshire).

Variety of the Common Toad.—A curious variety of the Common Toad (*Bufo vulgaris*) was found in the garden here on July 11th. It

was a young animal apparently in its second year. The general tint was a pale yellowish drab or fawn-colour, with darker markings and small brick-red spots. About the head and face were irregularly shaped patches of a decided indigo-blue. Though the colouring of the young is often much more lively and varied than in older individuals, I never before met with a specimen showing any trace of the last mentioned colour.—G. T. ROPE (Blaxhall, Suffolk).

Palmated Newt (*Molge palmata*) in Western Carnarvonshire and Bardsey Island.—The Palmated Newt has a wider distribution in Britain than the two commoner species, and is found in parts of Wales, especially in the west, where the Crested and Smooth Newts do not appear to occur. In 1887 Mr. C. Oldham and I found it at Porth Ceiriad, near Abersoch, in Western Carnarvonshire (Zool. 1888, p. 394); on June 17th, 1905, I came across it still further to the west, close to Braich-y-pwll, the most westerly point in Lley. The Newts were in some shallow pools, below marshy ground at the top of the cliffs, at the side of the path which leads down to St. Mary's Well. These pools, owing to the dry weather, did not cover many square yards. Two days before I found Palmated Newts on Bardsey Island, about two miles to the south-west of Braich-y-pwll. Near the ruins of St. Mary's Abbey, on the island, there is a well of cool clear water, which the inhabitants told us never fails, though in droughts many of the other sources of water supply run dry. Two or three small hollows have been made just below the well for the purpose of watering the Sheep; in the largest of these pools or hollows, only about a couple of yards in diameter, there were a number of adult Newts. No other batrachians, nor any of the reptiles, are known to occur on the island. T. A. COWARD (Bowdon, Cheshire).

The Palmated Newt near Hastings.—So little is known of the distribution of our native Newts, that it may be worth while to state that the Palmated form (*Molge palmata*) is of frequent occurrence in the Hastings district. My determination of the species has been confirmed by Mr. Ruskin Butterfield. From its general resemblance to the Smooth Newt (*M. vulgaris*), the present species is doubtless often overlooked; it may, however, be recognized by the absence of pigment from the throat, by the partially webbed hind feet, and by the presence (in the male) of a filamentous process extending beyond the tail. This process appears in the young Newts some days before the disappearance of the gills. The larvæ of *M. cristata* also have very long filaments, but these are tapering, and not abrupt, as is the case with *M. palmata*.—WILFRID OLLIS (Westwood, Holmesdale Gardens, Hastings).

THE ZOOLOGICAL SOCIETY'S GARDENS.

THE great event at the Zoological Gardens during July was the completion of the new Seal Pond, which was started at the beginning of the year, and stands on the site of some Goose-paddocks, alongside the enclosures of the Ostrich House. The pond, containing about 96,481 gallons and measuring about thirty by eighteen yards, is six feet at the deepest and two feet at the shallowest end. At the deepest end rises to a height of twenty-six feet or so an imposing edifice of natural and artificial rockwork resembling a stratified sandstone cliff. At its base are the sleeping shelters for the Seals; and some eight feet above the water projects a slab of rock, forming a diving platform. In addition to the Common Seal and the female Californian Sea-Lion which have been in the menagerie for a few years, three young males of the last-mentioned species have been purchased as occupants of the pond. The feeding of these animals every afternoon is one of the great attractions at the Gardens.

The Society has more Leopards offered to it than space can be found to accommodate. Two of these animals, however, received during the past month, are of special interest, and make valuable additions to the fine series of these animals now in the Gardens. One of them, a cub, presented by Mr. F. H. Melland, came from North-east Rhodesia; the other, a subadult female, presented by Mr. Bullin, was captured near Hong Kong. Tracing them from east to west, there are now in the Gardens Leopards from Hong Kong, Malacca, Ceylon, India, Persia, Somaliland, East and Central Africa. In the case of the Asiatic specimens it is interesting to note that the richest-coloured example comes from Hong Kong, and the palest from Persia. Of more scientific, though less popular interest than the Leopards is a Little Ant-eater, or Tamandua, which is feeding well, and seems likely to thrive.

Although overshadowed in importance by the Seal Pond, the new aviary for Plovers and small perching birds is admitted on all hands to be the prettiest aviary in the Gardens. Lying between the back of the Lions' House and the great lawn, it rises to a height of about twenty feet, and covers an area of about twenty-six by eighteen yards. In the middle there is a large irregularly shaped pond, planted with rushes at the back, with water-lilies in the middle, and filled in with gravel to form shallows for the wading birds in front. In front of the pond there is a stretch of white sand; behind it and at the sides grow lilacs, hollies, laurels, forming a shrubbery for the smaller birds to

nest in. In this aviary the birds may be observed under conditions as nearly natural as it is possible to make them. Paddling about in the shallows may be seen Ruffs, Godwits, Avocets, Ringed Plovers, and Knots; a Swallow circles gracefully over the pond, and Turtle-Doves coo from the bushes.

So far as the collection of birds is concerned, the most important additions are a magnificent cock Ostrich from Somaliland, one of Hagenbeck's birds, which has recently been on exhibition at the Crystal Palace; and a series of small birds, including Blue and Maroon Tanagers, Guiana Love-birds, and two Guiana Tree-Ducks, all from British Guiana, and presented by Mr. E. W. Harper, F.Z.S. By a curious coincidence we have also received a pair of Oriental Tree-Ducks (*Dendrocygna major*), presented by Mr. W. Jamrach. The breeding and hatching of Screamers, which has only been achieved in our Gardens, and for the first time on record last year, is becoming quite a common occurrence. The pair have just hatched off their second lot of eggs, namely, four in number, this season in the Great Aviary.

R. I. P.

NOTICES OF NEW BOOKS.

The British Tunicata; an unfinished Monograph by the late JOSHUA ALDER and the late ALBANY HANCOCK. Edited by JOHN HOPKINSON, with a history of the work by Canon A. M. NORMAN. Ray Society.

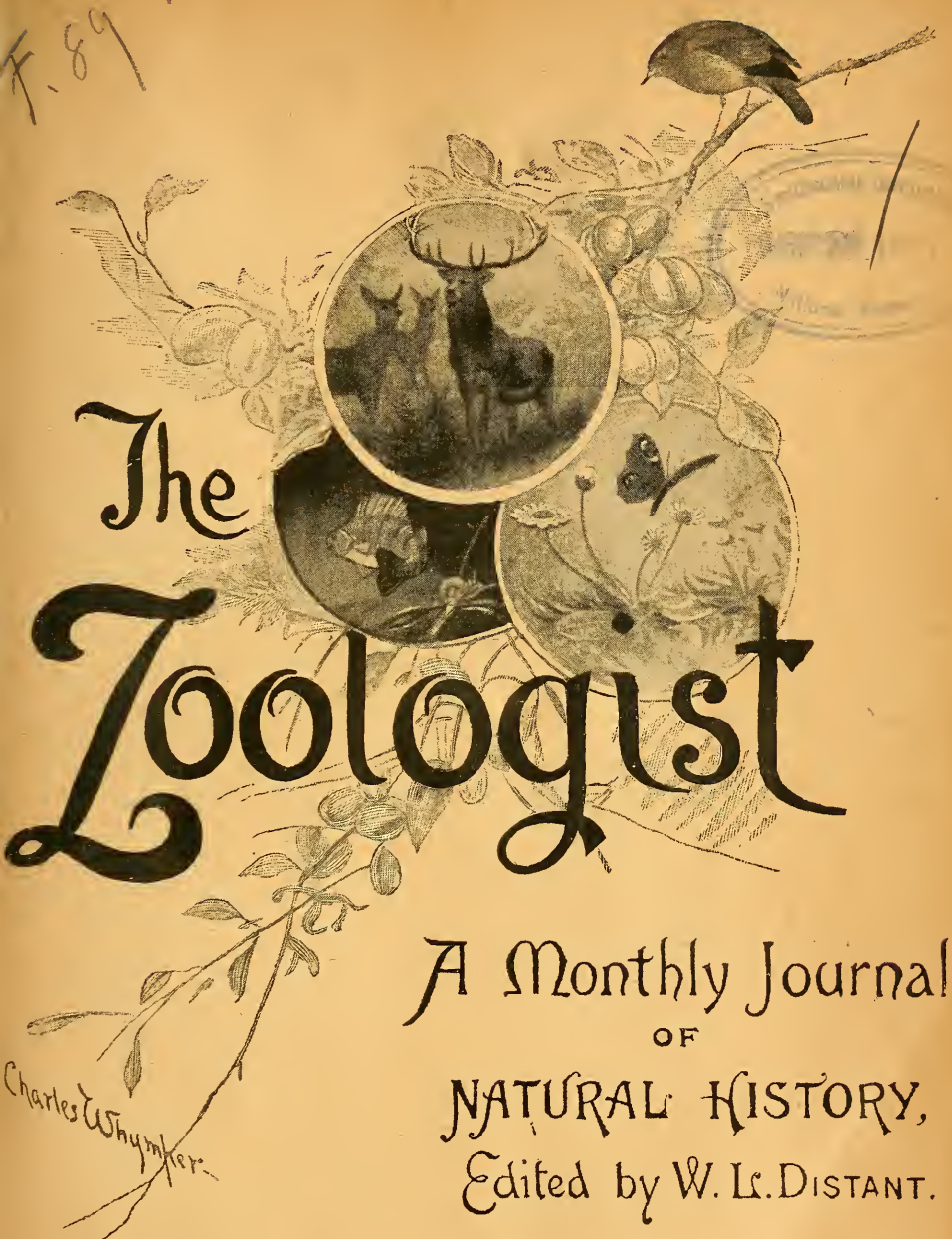
THIS is indeed a posthumous publication, but a very welcome one nevertheless. Between 1855 and 1860 Mr. Alder, at the request of Dr. Gray, undertook to prepare a "Catalogue of British Tunicata," to form a British Museum publication. When, however, the work was written by 1863, the Museum grant for the publication of these catalogues had been withdrawn, and consequently it could not appear as originally intended. It was now arranged that Alder, with Albany Hancock, should prepare a more elaborate monograph for publication by the Ray Society, but the first named died in 1867, and Hancock only survived him till 1873, the work being still incomplete. Then Prof. Huxley was consulted, who agreed to do what he could in the matter of completing the work, but from various causes he was compelled to relinquish the task. The MSS. and drawings were placed under the care of the Committee of the Newcastle Natural History Society, where they remained until last year, when the work, having again been accepted by the Ray Society, it was, at the request of Canon Norman, forwarded for publication; for, as that authority states, the value of the monograph consists, among other points, in supplying full descriptions with illustrations of the Tunicata of our fauna as known up to the time of the death of the authors. Much sympathetic and valuable work has been expended by the editor, Mr. Hopkinson, in preparing the manuscript for the press, and this somewhat small book is another witness to the sound work of the Ray Society in making such publications possible for the use of zoologists.

The introduction is a very instructive and interesting composition. As regards the disputed position of the Tunicata in

zoological classification, the conclusion arrived at is that the Tunicata should be placed with the Mollusca. A chronological epitome of the bibliography has been compiled with care and sufficient amplitude, and, as Albany Hancock died before the conclusion of his investigation of this class of animals, "and had not written that portion of the introduction to this work which would have embraced his latest views of their anatomy and physiology," a paper which he contributed to the Linnean Society in 1867 on the subject is reproduced.

In the body of the work itself thirty British species are described, all being placed in the genus *Ascidia*; the descriptions seem ample and to the point, of a *specific* character, and not the minute diagnosis of a *specimen* as is now so frequently the case in the description of some other creatures. There are seventeen plates, and in relation to these we read:—"All Hancock's admirable work was effected with the aid of such simple means as scalpels and needles. Section-cutting and the use of chemical reagents were in his day unknown. Our author's custom was to gradually and most carefully dissect the animal, and to continually make new drawings as each fresh membrane or organ was removed, thus mastering every detail, and then, aided by the numerous sketches before him, the finished drawing was produced. Now, among the mass of drawings relating to the Tunicata, comparatively few have been finally perfected." These have been reproduced, together with such careful selections from the rest of the drawings as seemed to possess most value.

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The Zoologist

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BOOTED EAGLE AND NEST (*cf.* p. 325).

THE ZOOLOGIST

No. 771.—September, 1905.

BIRDS NESTING IN ANDALUSIA.

BY REG. B. LODGE.

(PLATE V.)

THIS season (1905) has been a disastrous one for the birds as well as for the people of Spain, especially in the south of that country. No rain having fallen since October, except two half-days in April, the crops proved a complete failure, causing widespread distress and poverty. The effect on the marsh and wading birds can be easily imagined, for as there were no marshes the birds did not put in an appearance, and those few which might be seen did not appear to be nesting. In the Marismas, where in normal years you may see shallow water stretching to the horizon, enlivened with thousands of Flamingoes, Stilts, Avocets, Pratincoles, the beautiful Southern Herons, and Marsh Terns in myriads, and where I have seen eggs picked up literally by the basketful, there was hardly a drop of water. Over the parched and dried-up mud, baked to a brick-like hardness, were a few Kentish Plovers, Redshanks, and Peewits. We heard of two (!) Flamingoes several miles away, and saw perhaps altogether in about a fortnight some dozen Pratincoles. Round the half-starved groups of cattle were a few Buff-backed Herons, but their usual nesting place was completely dried up, and

stamped out of existence by the cattle in their thirst seeking the last drop of moisture ; there were also some in the neighbourhood of the Laguna de la Janda, but it was too early then for them to be nesting ; indeed, I doubt whether they ever do nest there. In this last locality we saw two or three pairs of Cranes, which from their behaviour seemed to be about to nest, but we left before they had begun to do so (April 21st). There were also some flocks of Whiskered Terns, and many Marsh-Harriers and White Storks, with a few Purple Herons and Mallards.

In the plains, which in April were ablaze with colour from the many wild flowers which are such a conspicuous feature of the Spanish spring-time, perhaps the most common bird was the Corn-Bunting, of which we found many nests on the ground, generally at the foot of a tall plant somewhat like a lily. The Stonechat was also nesting in similar situations. The Calandra Lark and Crested Lark were also very common, and we found nests of both species. On the topmost twigs of the bushes sat numbers of Woodchats, their chestnut heads looking almost blood-red in the sunshine. Their nests, like those of the Grey Shrike (*Lanius meridionalis*), were always made of some whitish-coloured twigs, and were rather loosely constructed. In one locality we found several in the trees of a large orange orchard, as also many nests of Goldfinches, and one of an Orphean Warbler. Both Goldfinches and Serins are exceedingly numerous. Blackbirds were fairly common, and we saw several nests ; but the Song-Thrush is, I believe, a winter visitor only. We only saw two, one as late as the end of April. The Blue Rock-Thrush was seen at Gibraltar, and invariably whenever we were among rocks.

The first Bee-eater was seen from the train on March 30th, an early date for it ; their first appearance in numbers was on April 15th, on which day the telegraph-wire was crowded with them. Nightingales were heard on April 13th, Turtle-Doves April 19th, and Cuckoo April 13th. House-Martins were building on March 30th. Many Crag-Martins, Lesser Kestrels, and Pallid Swifts were seen at Ronda on March 31st. A Hoopoe was noticed on March 30th. Black Chats were beginning to nest at Ronda on April 3rd. White Storks were observed on

their nests on farmhouses near Córdoba on March 31st. Many Russet Wheatears, as well as another species not identified, and Stonechats, in the neighbourhood of Ronda, were flitting about the stone walls dividing the fields. The Common Wren and Orphean Warblers were seen in same place on April 2nd. On April 20th, while climbing to a Griffon's nest, a Wren's nest was seen built against the back of a cave high up in the rocks.

One of the chief objects of our expedition was to see something of the larger birds of prey, and if possible to obtain photographs of them.

At Ronda, where we saw the first Griffon within five minutes after leaving the station on our first arrival, we made an attempt to attract them by a bait, by exposing a sheep's head, which was connected by a thread to the shutter-release of a concealed camera. Though they discovered the bait immediately, one of the great scavengers flying overhead before we had finished the concealment of the camera, they refused to descend so far down into the valley. The selected spot was on a buttress or spur of rock, which projected from the perpendicular cliff on the top of which is perched the town of Ronda. Within a short time of seeing the first one there were four Griffons sailing overhead, and presently ten of the huge birds were in sight, but by degrees they mounted higher and higher in the sky, and finally vanished. Their place was taken then by four or five Egyptian Vultures, which approached much nearer, and even settled on the side of the rocky slope not far away; but they also failed to come to close quarters, and eventually, though we waited until the light began to fail, we had to give it up, and take the camera home unsuccessful. The Spaniards told me that in a month's time I should have no difficulty, for after the bull-fight the dead horses would be thrown over the cliff, and the Vultures would then assemble from far and wide, and could be photographed without any trouble.

However, we could not stop so long, and, though the same plan was tried in several localities with different baits, we did not succeed in getting a photograph that was any good. Once a Dog was photographed which had been attracted by the bait.

The camera had been set at the remains of a Pig which had been devoured by Griffons that morning. Unfortunately we only found it too late, when nothing but a few bones were left, by seeing great numbers of Griffons flying round, while we were wading about in search of Cranes' nests. Creeping up behind a Donkey that happened to be grazing close by, I was able to focus about thirty Griffons sitting in a circle round some bones; but instead of making sure of one plate, thinking they were gorged, I tried to get a little nearer, and lost the chance, for they all took alarm and flew off; the last diners to leave being two Marsh-Harriers, which were busily engaged in securing the fragments left by the larger birds.

One thing was very striking at all these attempts—the quickness with which the bait was discovered; every time there was either a Griffon or a pair of Egyptian Vultures soaring overhead before the camera was duly arranged and hidden, although none were in sight at the beginning. I think now that if we had put a whole carcass, either a Pig or kid, we should have succeeded. A dead Rabbit was also tried on the sand-dunes in the same way for Kites or Eagles. The first day the bait was carried off bodily, and the string snapped without releasing the shutter. Probably a Booted Eagle had swooped down and carried off the bait without alighting, for there was no track or sign of footprint on the fine sand on which it lay. The next day the bait—another Rabbit put in the same place—had been partly eaten, judging from the footprints around, by a Kite. Two Kites were soaring over the spot, but on developing the plate, on my return, it was found to be badly fogged. Waiting so many hours, only covered by the roller-blind shutter, in the burning sun of Andalusia had been too great a trial. Although my trapping was so unsuccessful, it was partly from bad luck, and I think a prolonged attempt on similar lines would lead to some good results with the numerous birds of prey to be found in the sierras and forests of Spain.

But if we failed in photographing Griffons at a carcass, we succeeded in finding one within range of a telephoto lens while sitting in its nest by the side of a half-grown young one, and, by clambering into another nest with camera and tripod, in photographing a young bird in down, the occupant thereof; and also

in getting eggs from adjacent nests (April 20th, addled). There was very little smell noticeable at their nests, which were neatly made, and big enough to hold three of us at once. We also took several clutches of Egyptian Vultures, and twice found them nesting in company with Griffons. When sitting in their nesting-caves in the face of the precipice, these immense birds appear to be no larger than Starlings.

We saw altogether three Bonelli's Eagles. One of these, while flying near a griffonry, in which, though we did not see it, was possibly its own eyrie, appearing to resent the near approach of a Griffon, made a magnificent "stoop," and knocked it fairly head over heels, though it soon recovered itself again. We were shown, on April 5th, a nest in a tremendous "tajo," quite six hundred feet in height, and very overhung. While some goat-herds were pointing out the nest to us the Eagle left it, and flew across the narrow gorge, giving us a fine view of it; and from another nest about a fortnight later we took the single egg by means of a rope. This egg, which was addled, was long and pointed, and faintly splashed with reddish markings.

A nest was found of the Short-toed Eagle in a silver poplar, containing two eggs—an unusual number, this Eagle generally laying but one egg.

The Booted Eagle we found very abundant, eight nests being found in pine trees and poplars at the end of April and beginning of May, containing one and two eggs, and in one case three well-grown young. At one nest we obtained a photograph of the bird itself, and noticed the curious note of this small but plucky Eagle. At first I took it for the note of some unknown bird the size of a Blackbird or Oriole, and what was my surprise to see that it proceeded from a Booted Eagle which was sitting on the ground not more than ten yards from my hiding-place. It sounded like "kivi, kivi," rather wild and sweet, not at all what you might expect for an Eagle. At another nest, while engaged up the tree in manipulating a camera, and lashing the tripod to a convenient branch, the bird flew in and settled close to, and remained an instant or two before dashing out again with a scream. There were two white eggs in this nest, which was built in a stone-pine, and also half a young Rabbit. (A female Booted Eagle shot was of a dark uniform brown colour all over,

breast as well as back. The cere and legs of a pale lemon-yellow.)

We were somewhat late for the Common Kite by the time we reached the pine forests (April 26th), but saw many of the birds, and found one nest containing an egg and two young. (By the bye, I have only once found less than three as the clutch of the Kite, and more often than not have found three eggs in nests of the Black Kite, though towards the middle of May, if they have been robbed a good deal in the district, many nests will have but two. An undoubted nest of the Black Kite contained three eggs, and a very choice assortment of rags. In 'Wild Spain,' Chapman gives two eggs as the usual number, and says the Black Kite uses no rags.) The Black Kites had suffered a good deal from the charcoal-burners, who eat both Kite's and Eagle's eggs. (A boy told me he had eaten a clutch of "Polluela" eggs, either Little, Spotted, or Baillon's Crake, for they have but one word for the three.) Many Peregrines, probably on migration, were flying over these forests, and apparently sitting in empty nests. From one such in a large pine-tree, on a second visit a week or ten days afterwards, we took four Raven's eggs. Kestrels, too, were frequently seen, but only one clutch of eggs was found. Two pairs of Marsh-Harriers were nesting in a small patch of reeds, the only remnant of what should have been an immense marsh.

Great numbers of Red Deer were to be seen round the Marisma district, and on the dried mud were seen on several occasions two of the famous wild Camels.

Below I give lists of species seen in 1897 and 1905, with dates for some of the migratory birds, and eggs.

SPECIES SEEN IN 1897.

Blackbird	Greenfinch
Great Reed-Warbler	Serin
Blue Tit	Goldfinch
Golden Oriole	Sparrow, ? sp.
Grey Shrike (<i>meridionalis</i>)	Chaffinch
Woodchat	Reed-Bunting; eggs
Swallow	Starling (<i>unicolor</i>); eggs
Martin	Magpie; eggs
Sand-Martin	Jackdaw; eggs, May 7

Raven ; eggs, May 5	Buff-backed Heron ; eggs, May 5
Swift	Night-Heron ; eggs, May 8
Nightjar (<i>ruficollis</i>)	Glossy Ibis ; eggs, May 8
Wryneck ; April	Squacco Heron ; eggs, May 8
Woodpecker (<i>sharpii</i>)	White Stork
Kingfisher ; April	Spoonbill ; eggs, May 1
Roller	Flamingo
Bee-eater ; eggs, May 7	Mallard
Golden Oriole ; April	Wood-Pigeon ; eggs
Hoopoe	Turtle-Dove
Cuckoo	Partridge, French
Great Spotted Cuckoo	Coot ; eggs
Barn-Owl ; young, April 30	Stone Curlew ; eggs
Little Owl ; eggs, May 7	Pratincole ; eggs, May 3
Scops Owl	Ringed Plover
Egyptian Vulture	Kentish Plover ; eggs, May 6
Marsh-Harrier	Curlew ; April.
Montagu's Harrier	Redshank ; eggs, May 3
Short-toed Eagle	Lapwing ; eggs
Booted Eagle ; eggs	Avocet ; eggs, May 13
Imperial Eagle	Stilt ; eggs, May 3
Kite ; eggs, April 30	Green Sandpiper
Black Kite ; eggs, May 2	Dunlin ; end of April
Kestrel ; eggs, April 30	Godwit, ? sp. ; end of April
Lesser Kestrel	Black Tern ; eggs, May 4
Peregrine	Whiskered Tern ; eggs, May 4
Purple Heron ; eggs, May 1	Little Grebe
Little Egret ; eggs, May 5	

SPECIES SEEN IN 1905.

Blackbird ; eggs, April 16	Tree-Creeper
Thrush	Swallow ; nesting, March 30
Blue Rock-Thrush ; April 4	Crag-Martin ; March 31
Russet Wheatear ; April 1	Martin ; nesting, March 30
Black Chat ; nesting, April 3	Chaffinch
Whinchat ; May 9	Serin
Stonechat ; April 16	Greenfinch
Nightingale, April 13 ; eggs, May 11	Goldfinch ; eggs, April 20
Great Reed-Warbler	Sparrow, ? sp.
Rufous Warbler ; May 6	Corn-Bunting ; eggs, April 14
Orphean Warbler, April 2 ; eggs, May 5	Starling (<i>unicolor</i>)
Melodious Warbler ; eggs, May 11	Magpie ; eggs, May 9
Black-headed Warbler ; eggs, April 25	Raven ; eggs, April 26
Dartford Warbler ; young, April 17	Jackdaw ; eggs, May 1
Great Tit ; eggs, May 9	Crested Lark ; eggs, April 19
Blue-headed Wagtail ; April 2	Calandra Lark ; eggs, April 15
White Wagtail	Dresser's Short-toed Lark
Wren ; nest, April 20	Swift
Richard's Pipit (?)	Pallid Swift ; March 31
Golden Oriole ; May 6	Nightjar (<i>ruficollis</i>)
Grey Shrike ; eggs, May 4	Woodpecker (<i>sharpii</i>)
Woodchat ; eggs, April 15	Bee-eater ; March 30
Spotted Flycatcher ; May 5	Golden Oriole ; May 6
Pied Flycatcher ; May 6	Hoopoe ; March 30
	Cuckoo ; April 13
	Barn-Owl

Scops Owl (heard)	Mallard
Griffon; eggs (addled), and young, April 20	Wood-Pigeon
Egyptian Vulture; eggs, April 17	Turtle-Dove; April 19
Marsh-Harrier; eggs, May 1	Rock-Dove
Bonelli's Eagle; egg (addled), April 20	Partridge, French
Short-toed Eagle; eggs, April 25	Quail; April 16
Booted Eagle; eggs, April 27	Crane, Common; April 19
Imperial Eagle	Great Bustard
Kite; eggs and young, April 27	Little Bustard
Black Kite; eggs, April 26	Pratincole; May 1
Kestrel; eggs, May 1	Kentish Plover; May 1
Lesser Kestrel; March 31	Ringed Plover
Peregrine; end of April	Dusky Redshank
Purple Heron; April 14	Redshank; May 1
Little Egret; April 10	Common Sandpiper
Buff-backed Heron; April 13	Lapwing; May 1
White Stork; nesting, March 31	Stilt; May 1
	Whiskered Tern; April 13

TASMANIAN NOTES TAKEN IN 1903: THE LITTLE
PENGUIN (*EUDYPTULA MINOR*).

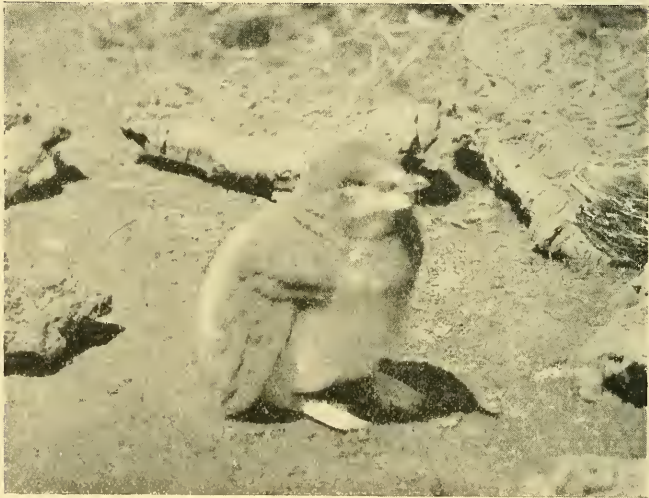
By J. R. McClymont.

June 23rd.—I have been watching a Little Penguin pursue small fish. It was but a few yards from the shore of the River Derwent, but, as the water was somewhat muddy, its movements under water could not be discerned. As the result of its actions many little fishes—perhaps Sand-Smelts—leapt out of the water. The Penguin appeared on the surface of the water at intervals of about half a minute, and swam or floated on the surface for but a few seconds before again diving. These proceedings continued for about ten minutes, after which time the bird disappeared. It had doubtless swum away to some distance under water. The depth of the water in which the pursuit of the small fish took place was from two to four feet, and the bottom is of sand and shells. A Silver Gull was attendant upon the Penguin's actions, and when the latter appeared on the surface would fly to the spot, as if it expected to obtain food dropped by the Penguin. This Gull sometimes follows Cormorants when they are catching fish.

24th. — Two Penguins in the flesh were sent to me from Norfolk Bay. They were males, and measured 17 in. and 17½ in. in length. They were in the plumage which I surmise is that of birds not quite mature—that is to say, the space below the eyes was greyish white, whereas in those birds which, I opine, have completed the changes of plumage there is underneath the eye a band of slaty blue about one-fifth of an inch wide, which extends from the lore to the aural region. The birds without this band I believe to be the *Spheniscus undina* of Gould's 'Birds of Australia,' vol. vii. P. 85; those with the band the *S. minor* of the same work (vol. vii. P. 84). I cannot, however, positively affirm that *Eudyptula minor*, Forst., and *E. undina*, Gould, are the same species, and use the name *Eudyptula minor*

provisionally to denote the birds which resemble those figured in the two plates above mentioned. The basal portions of the feathers of the throat and fore neck of the above-mentioned specimens were tinged with black, but this colour was not permanent, but disappeared in the process of preserving.

October 20th.—Two Little Penguins, on which nestling down still adhered in a few places, forming, *e.g.*, a ruff round the neck of one of them, were received from Norfolk Bay. They were in a small wooden case, and snapped at my fingers when they were thrust into the case, and also snapped occasionally at one



A NESTLING PENGUIN.

another. They uttered a sound resembling the hiss of a Goose, but much less loud. The eye had a watery appearance, and the iris was light green.

21st.—I have liberated the two young Penguins. When they were taken out of the case and placed on a sandy beach they appeared to be somewhat dazed, and remained motionless; but when I placed them in the water they became animated, and swam away with apparent ease. The receding wave may have imparted an impetus.

December 22nd.—Two nestling Penguins were received. They were younger birds than the two previously mentioned, and were

clad entirely in down, inclusive of the flippers. The down was smoke-grey, except on the lower part of the breast and the abdomen, where it was dingy white.

23rd.—I have had one of the nestlings photographed (*ante*, p. 330). I wished to have both birds photographed in one picture, but they were extremely obstinate and self-willed, and could not both be kept motionless. After many attempts one bird was kept motionless, and two negatives obtained. One of these shows the bird in a standing attitude, with the tarso-metatarsus in contact with the ground. After being photographed it was given to a friend, and lived on very friendly terms with his spaniel, but at last disappeared, and its fate is unknown.

Sandy Bay, Tasmania.

BIOLOGICAL SUGGESTIONS.

EXTERMINATION IN ANIMAL LIFE.

Part I.—BY NATURAL OR NON-HUMAN AGENCY.

BY W. L. DISTANT.

(Continued from p. 292.)

To understand some processes of actual extinction of species, it is necessary to study causes that tend toward that result, factors which alone are not destructive, but which combined, or recurrent, eventually act as do a persistent series of non-mortal ailments on the human constitution, sapping its vitality, and rendering it vulnerable to an attack not essentially destructive. In nature we meet with many of these sporadic phenomena, which we consider much rarer than they really are, and this partially from our paucity of observations and records, and also largely incidental to our usually spending our existence in one area. On the island of Sakhalin, which at present is of some political notoriety, the peat-formation of the tundras, according to Prof. von Krasnow, reaches in many places a thickness of fifty feet, and beneath it upright fossil larch-stems, which have been buried *in situ*, can often be seen. The destruction of these woods might be ascribed to a change of climate, but another explanation may also be found. "The snow, owing to the cold and gloomy summer, lies as late as July under the shelter of the forest on badly drained clayey soil. The surface, constantly damp, becomes covered with a growth of swamp vegetation, which more and more prevents the access of the summer air and the thawing of the soil. Thus the conditions become more and more unfavourable to the growth of the forest, till even the moisture-loving larch gives place to the bare tundra. All the wide plains of Sakhalin have therefore been transformed into tundras and half-frozen peat-bogs, and a true polar landscape prevails wherever mountains or hills are ab-

sent.”* Dr. Philippon considers the steady destruction of forests in the Peloponnesus as due in a large measure to the characteristics of the Mediterranean climate. “In the Mediterranean region, with its scorching rainless summers, its mostly violent rains in other seasons, and its rare frosts, the formation of new soil is slower and denudation more rapid than in Central and Northern Europe. Hence, when forests are destroyed, bare rocky slopes are exposed, unless maquis (dense evergreen scrub) succeed in getting a hold before the last of the soil is washed away. When the maquis again are removed, whether by accidental fires or of the action of the charcoal-burners (their great enemy), their place is taken by still more meagre forms—either the stunted kermes oak, or the scattered prickly phrygana.”† It is unnecessary to refer to the effects of these changes on animal life.

Knapp has recorded that in 1825, for many miles round his residence, and with his ignorance as to further extension, scarcely any female calves were born. “Dairies of forty or fifty cows produced not more than five or six, these of inferior numbers in the same proportion, and the price of female calves for rearing was greatly augmented.”‡ He appositely remarks, in the wild state an event like this would have considerable influence upon the usual product of some future herd. To grasp the full bearing of this record we require much further information, especially as to the nature of that season’s grass, or the previous season’s roots. Geddes and Thomson state that a general conclusion, “more or less clearly grasped by numerous investigators, is that favourable nutritive conditions tend to produce females, and unfavourable conditions males.”§ Thus bad crops, or a partial

* Rept. of paper read at Berlin Geogr. Soc. Jan. 4th, 1896, *cf.* ‘Geograph. Journ.’ vol. vii. p. 423.

† Petermann’s “Mittheilungen,” 1895, No. 12, *cf.* ‘Geograph. Journ.’ *l. c.* p. 426.

‡ ‘Journ. of a Naturalist,’ p. 139, *note.*

§ ‘Evolution of Sex,’ p. 50. — Dr. Hecker has stated that, after the cessation of the Black Plague, a greater fecundity in women was everywhere remarkable—a grand phenomenon, which, from its occurrence after every destructive pestilence, proves to conviction, if any occurrence can do so, the prevalence of a higher power in the direction of general organic life. Marriages were, almost without exception, prolific; and double and treble births were more frequent than at other times.—(‘The Epidemics of the Middle Ages,’ translated by B. G. Babington, p. 31.)

famine, might primarily cause a preponderance of male births, and subsequently, if at all recurrent, bring about a diminution of individuals; in other words, unusual meteorological conditions might seriously diminish that portion of a flora absolutely important to the nutriment of a dependent fauna, and so, without actually causing starvation, might effect a preponderance in male births, and also the introduction of a weakening or destructive element advancing the decline which precedes the fall.

This brings us to the consideration of droughts and their primary and secondary consequences. It is extremely difficult to focus the information on this subject, as it is scattered about in different publications of various nationalities. Even when found often little is recorded, and where fuller records exist they are often inaccessible. Darwin of course has observed and graphically recorded the effect of drought, when travelling in South America. "The period included between the years 1827 and 1830 is called the 'gran seco,' or the great drought. During this time so little rain fell that the vegetation, even to the thistles, failed; the brooks were dried up, and the whole country assumed the appearance of a dusty high road. This was especially the case in the northern part of the province of Buenos Ayres and the southern part of St. Fé. Very great numbers of birds, wild animals, cattle, and horses perished from the want of food and water. . . . The lowest estimate of the loss of cattle in the province of Buenos Ayres alone was taken at one million head. A proprietor of San Pedro had previously to these years 20,000 cattle; at the end not one remained."* We can well imagine the effect that an occasional drought like this must cause to much animal and vegetal life, but, when droughts are recurrent, extinction rather than depopulation must ensue to many species in the course of time. Darwin himself further remarks: "These droughts to a certain degree seem to be almost periodical; I was told the date of several others, and the intervals were about fifteen years."† Livingstone has described a similar infliction in South Africa: "The place where we first settled with the Bakwains is called Chonuane, and it happened to be

* 'Journ. Research. Voy. Beagle,' pp. 132-133 (1860).

† *Loc. cit.* p. 134, note.

visited, during the first year of our residence there, by one of those droughts which occur from time to time in even the most favoured districts of Africa; . . . in our second year again no rain fell. In the third the same extraordinary drought followed. Indeed, not ten inches of water fell during these two years, and the Kolobeng ran dry; so many fish were killed that the Hyænas from the whole country round collected to the feast, and were unable to finish the putrid masses. . . . I put the bulb of a thermometer three inches under the soil in the sun at midday, and I found the mercury to stand at 132° to 134° ; and if certain kinds of beetles were placed on the surface, they ran about a few seconds and expired."* A great drought also prevailed in South Africa in the year 1862, subsequent to the one described by Livingstone. It was very severely felt in the Lesuto, which is a territory generally blessed with abundant rains at stated periods. In this portion of the country, by the month of November, no traces of vegetation remained, the vast grass plains becoming mere sandy deserts from the excessive heat that prevailed. The largest streams ceased to flow. Cattle died by thousands. The mighty Orange River could be stepped across by a child, and in its upper part, at least, ran dry.† Can any naturalist or sportsman read this account without involuntarily estimating the loss to animal and vegetal life which must have ensued, and which to many endemic species must have meant extinction, and to others the diminution that precedes decay and annihilation? In marching across Laikipia, in eastern Central Africa, Dr. Gregory found here and there around a water-hole "acres of ground white with the bones of Rhinoceros and Zebra, Gazelle and Antelope, Jackal and Hyæna, and among them we once observed the remains of a Lion. All the bones of the skeleton were there, and they were fresh and ungnawed. The explanation is simple. The year before there had been a drought which had cleared both game and people from the district. Those which did not migrate crowded round the dwindling pools, and fought for the last drop of water. These accumulations of bones were therefore due to a drought."‡ A similar observation was made by

* 'Missionary Trav. in S. Africa,' pp. 20 and 21.

† Cf. Croumie Brown, 'Hydrology of S. Africa,' p. 112.

‡ 'The Great Rift Valley,' p. 268.

Neumann at Lake Rudolph: "Alongside a rocky gully, right on the lake side, a patch of the black lava *débris* was covered thickly with bleached bones. From a distance it looked like snow, and I wondered what in the world it could be; but on getting close I found it to consist of the whitened bones of 'Camels.' Hundreds must have perished here, all huddled in one little corner." * A gradual desiccation is generally believed to have prevailed in South Africa for a long time past, and the process is not confined to that continent. According to Semon, the climate and meteorological conditions of Australia are such at present that a single drought of several years' duration can and often does exterminate all the aquatic inmates of a river. Few rivers have a lake-reservoir which they could feed upon in times of drought. The lack of water-treasuring mosses is likewise a prominent feature of the Australian bush. A drought setting in—and the short history of Australia tells us of periods when not a single raindrop has fallen for three or four years in a district known as commonly subject to rains—a whole river area is liable absolutely to dry up, and its animals will be exterminated, with exception of such as withstand desiccation in either their fully formed or embryonic state.† Arabia, especially the southern part, is stated to be still drying up. Water is disappearing from places where it used to exist, and the inhabitants are migrating towards Persia. The word famine is often an equivalent to that of drought, but the results recorded are usually confined to the destruction of human life, though we can generally realize how many species of other animals and plants have suffered and succumbed to these visitations. It may be sufficient to refer to the great drought in Egypt in the year 1060, when the Nile failed to flow for seven successive years, and one of the greatest famines on record occurred; in the years 1730–33 great drought and famine existed at the Cape de Verd Islands; whilst a similar event in India in 1876–78 is still in our own recollection.

It must be also remembered that, without actual extinction, a drought will often effect great morphological changes in plants, and that such may initiate constitutional weakness. Sign. Bolos wrote

* 'Elephant-Hunting in East Equatorial Africa,' p. 261.

† 'In the Australian Bush,' p. 89.

to the Rev. G. Henslow from Olot (Genova) that in consequence of a great drought such a transformation took place in a plant of *Rosa sepium* that it became unrecognizable. "The stalks, leaves, and flowers were reduced to half their size, the stems became much more thorny, the leaves, calyces, and flowers much more glandular." *

Estimating the natural phenomena of the past by our knowledge of those of the present, as we are compelled to do by the limits of our experience and intelligence, we may conclude that certain sporadic loss in animal life occurred then as now, † and of which we have not the particulars or summary. Such was a scarcity and epidemic among insects at Chontales recorded by Belt in 1872, and of Wasps in North Wales in 1865. ‡ Many records exist, and are frequently made both in these islands and on the Continent, as to years of scarcity in insect life, though this cannot of itself be considered in the light of an exterminative process, for often a prolific follows a meagre entomological year, but it is not difficult to imagine that should such a year of scarcity in insect life be also a year of great drought, or be attended or succeeded by a period of other disadvantages, then such a diminution in numbers to contest excessive mortality would probably prove fatal to many species. These coincidences must sometimes occur in the struggle for existence; it is not the adverse circumstances, or the single malady, which is difficult to conquer; but when adversity occurs in manifold directions, or an illness assumes the form of a complication of diseases, then the society or the individual succumbs. All life, including that of man, can only bear a certain strain; a central attack

* 'The Origin of Plant Structures,' p. 47.

† Of course this is a postulate requiring great qualification; for, as the late Sir J. F. Stephen argued, "All our anticipations involve an assumption utterly incapable of proof, that the future will resemble our present conception of the past."—"Necessary Truth"; 'Contemporary Review,' vol. xxv. p. 73.)

‡ 'Naturalist in Nicaragua,' pp. 180 and 181. — With Wasps, however, as recorded by Mr. Norman, "It is a curious fact that occasionally when queen Wasps have been unusually numerous in the spring, and there is every reason to expect a great abundance of Wasps, there are nevertheless very few in the autumn; while in other years, as in the case now (1851), after having had apparently a great paucity of queens, Wasps are very numerous."—('Zoologist,' vol. ix. p. 3236.)

may be repulsed, but when the flanks are turned at the same time a disaster is inevitable. Some sixty years ago the Sousliks (*Spermophilus* sp.) suddenly disappeared in the neighbourhood of Sarepta, in south-eastern Russia, in consequence of some epidemics; and for years no Sousliks were seen in that neighbourhood. It took many years before they became as numerous as they formerly were.* Mr. Guthrie, who noticed the occurrence of the larvæ of a blue-bottle (*Calliphora*) in the nostrils of Toads, writes that it is probable that the number of Toads is largely kept under by those means. In 1872 Toads were remarkably plentiful in the neighbourhood of Tenby, South Wales, and he noticed that the disease was very prevalent among them. In the following year scarcely any could be found, and he saw none diseased.† That epidemics do occur among wild birds is well known, and Dr. Stejneger records an instance with the Pelagic Cormorant (*Phalacrocorax pelagicus*) of the Commander Islands. “Thousands upon thousands” of these birds died during the winter of 1876–77, so that masses of dead birds covered the beach all round the islands.‡ Brehm, when travelling among the Ostiaks in Siberia, witnessed the devastating effect of splenic fever or anthrax among Reindeer. In the immediate neighbourhood of one tshum—the hut of the Ostiak—he counted seventy-six dead Reindeer. “Wherever the eye turned it lighted on carcasses, or on beasts both young and old, lying at their last gasp. . . . The unfortunate herd, which had started from the Ural two thousand strong, and had now dwindled to a couple of hundred, whose path was marked by a line of carcasses, was collected afresh around the tshum, but next morning there were again forty corpses around the resting-place.” § The epidemic among the mammals of South Africa a few years ago is still in our recollection. In the same country, Gordon Cumming, writing half a century ago, describes the Goat as being in many districts “subject to a disease called by the Boers ‘brunt-sickta,’ or burnt-sickness, owing to the animals inflicted with it exhibiting the appearance of having been burnt. It is incurable; and if

* Becker, ‘Bull. Soc. Moscou,’ 1889, p. 625.

† Cf. Pocock, ‘Roy. Nat. Hist.’ vol. vi. p. 68.

‡ Cf. Lucas, ‘Rept. Nat. Mus.’ Washington, 1891, p. 637.

§ ‘From North Pole to Equator,’ pp. 412–13.

the animals infected are not speedily killed, or put out of the way, the contagion rapidly spreads, and it is not uncommon for a farmer to lose his entire flock with it. This sad distemper also extends itself to the *fera naturæ*. I have shot Hartebeests, Black Wildebeests, Blesbucks, and Springbucks with their bodies covered with the disease. I have known seasons when the three latter animals were so generally affected by it that the vast plains throughout which they are found were covered with hundreds of skulls and skeletons of those that had died therefrom.”* At Buenos Ayres, the Coypú (*Myiopotamus coypú*) was much more abundant some fifty years ago than now, and its skin, which has a fine fur under the long coarse hair, was largely exported to Europe. About that time the Dictator Rosas issued a decree which made the killing of a Coypú a criminal offence. The result was that the animals increased and multiplied exceedingly, and, abandoning their aquatic habits, they became terrestrial and migratory, and swarmed everywhere in search of food. Suddenly a mysterious malady fell on them, from which they quickly perished, and became almost extinct.† Sometimes we can trace the interdependent conditions of these visitations. The liver-fluke of the Sheep (*Distomum (Fasciola) hepaticum*), as is generally known, is dependent on a small water-snail (*Limnæa truncatula*) as the intermediate host in which its earlier larval, sporocyst, and redia stages are passed through. The wet years 1816, 1817, 1830, 1853, and 1854—memorable for the occurrence of acute liver-rot in England, Germany, and France—showed that the weather also plays a considerable part in extending the suitable ground for *Limnæa* over wide areas, which in dry years may be safe pastures. In 1830 England lost from this cause one and a half million Sheep, representing some four millions of money; while in 1879–80 three millions died. In 1862 Ireland lost sixty per cent. of the flocks, and in 1882 vast numbers of Sheep perished in Buenos Ayres from this cause.‡ It is reported that there had been a scarcity of wild animals and birds in Nicaragua since the great hurricane of 1865.§

* ‘Five Years’ Hunt. Advent. in S. Africa’ (Compl. Pop. Ed.), p. 74.

† Hudson, ‘The Naturalist in La Plata,’ p. 12.

‡ Cf. Gamble, ‘Cambridge Nat. Hist.’ vol. ii. p. 67.

§ Collinson, cf. Brown, ‘Countries of the World,’ vol. iii. p. 38.

In 1880 a remarkable mortality occurred among the fishes of the Gulf of Mexico, which was ascribed to "poisoned water." In 1844, and again in 1854, and especially in 1878, similar fatalities had occurred. The earlier manifestations appear to have been the floating up of vast quantities of dead sponges—chiefly "loggerheads." According to Mr. E. Ingersoll, the attack of 1880 began suddenly, and immediately followed the terrible hurricane which is known as the "August gale," the fish and all other ocean life suddenly dying in hordes all along the southern (eastern) shore of Tampa Bay, on Egmont Key, at its mouth, which was its most northern point, and thence southward as far as Shark River, in Whitewater Bay, on the coast. Thence fatal localities were to be found in the currents that set southward through Bahia Honda Passage, through the North-west Passage beyond Key West, and even out in the neighbourhood of the far isolated Tortugas. Everywhere throughout this whole extent of coast, except in the mouths of the rivers and in the shallow bayous, all the forms of sea life died as though stricken by a plague fatal alike to all, and were drifted upon the beaches in long windrows so dense that near human habitations men were obliged to unite in burying them to prevent a pestilential stench, or to haul them away by wagon-loads to be prepared for manure, as was done in some cases. Besides fishes, sponges, crabs, and great numbers of molluscs were destroyed.* Mr. Ingersoll suggests that eruptions of volcanic gases may have taken place through the bottom of the sea. Mr. M. A. Moore wrote that about 1878, "whenever a smack with a full fare, *i. e.* a full cargo of fine healthy fish in her well, sailed into this poisoned water, every fish would die, and they would have to be thrown away." † Mr. S. H. Johnson states that "after very heavy rains and overflowing of rivers, the inner bays on the Texas coast suffer a loss of from one-half to three-fourths of their stock of salt-water fish, not including Mullet, which live as well in fresh as salt water." . . . "After a heavy rain and a freeze" in the winter of 1880-1, "all the salt-water fish in the *Laguna del Madre* (a large sheet of water lying between Padre Island and the mainland) were found dead on the banks." ‡

* 'Proc. U.S. Nat. Mus.' vol. iv. pp. 74-6.

† *Ibid.*, p. 125.

‡ *Ibid.*, p. 205.

Accidents in field and flood are not uncommon. Thus with the North American Bison, whose almost extirpation has been caused by man, other agencies effected a thinning-out process. It is stated that in 1867 upwards of two thousand Bison out of a herd of four thousand were lost in a quicksand; and that an entire herd of about one hundred head perished when crossing the ice on a lake in Minnesota.

The almost complete destruction of the Cray-fish (*Potamobia fluviatilis*) on the Thames was due to a disease, which first appeared near Staines and worked its way up the river, "with as much method as enteric fever worked its way down the Nile in the Egyptian campaign after Omdurman."* Even insect pests may thin out mammals. We read in the daily press that a flock of six thousand Sheep belonging to G. A. Brundrett, and feeding on Matagorda Islands, Texas, were driven by Mosquitoes into the water of Cedar Cañon. All but four hundred were drowned. The island is so infested (1902) with Mosquitoes that families have had to abandon their homes.†

On the other hand, it seems very evident that after unfavourable seasons which may have proved inimical to animal life, other circumstances may arrive which considerably add to the fecundity of species, and thus much loss may be repaired. There are facts to support this view. The Short-eared Owl (*Asio accipitrinus*), whose number of eggs is generally four, has been known when food is unusually abundant, as during a Lemming migration, to produce a clutch of seven or eight; and during a recent Vole plague in Scotland, in some instances as many as thirteen eggs were recorded. A similar instance has been narrated with reference to Trout at Vermont, North America. In a pond formed by damming a small stream to obtain water power for a saw-mill, and covering one thousand acres of primitive forest, the increased supply of food brought within reach of the fish multiplied them to that degree that, at the head of the pond where in the spring they crowded together in the brook, which supplied it, they were taken in the hands at pleasure, and swine caught them without difficulty. A single sweep of a small scoop-net would bring up half a bushel, carts

* Cornish, 'Naturalist on the Thames,' p. 52.

† 'Express,' October, 1902.

were filled with them as fast as if picked up on dry land, and in the fishing season they were commonly sold at a shilling (eight-pence halfpenny, or about seventeen cents) a bushel. The increase in the size of the Trout was as remarkable as the multiplication of their numbers.*

Again, the disappearance of an animal—especially a fish—is not necessarily due to extinction. In 1879 there was captured, off the coast of Massachusetts, a new species of Tile-fish, to which the name of *Lopholatilus chamæleonticeps* was given. Of this fish large catches were made, and it was expected it would rank among the most important food-fishes of the United States. But after a short interval the *Lopholatilus* disappeared, and soon good reasons for its absence were discovered. In the months of March and April, 1882, vessels arriving at Philadelphia, New York, and Boston reported having passed large numbers of dead or dying fish scattered over an area of many miles, and from descriptions and the occasional specimens brought in it was evident that the great majority of these were Tile-fish. As one account after another came in it became apparent that a vast destruction of fish had taken place, for vessels reported having sailed for forty, fifty, and sixty miles through floating fish; and in one case the schooner 'Navarino' ploughed for no fewer than one hundred and fifty miles through water dotted as far as the eye could reach with dying fishes. From careful computations made by Capt. Collins, it seemed that an area of 5000 to 7500 square statute miles were so thickly covered with dead or dying fish that their bulk "must have exceeded the enormous numbers of one billion." The cause of this sudden and vast mortality has been considered as due to some unusual lowering of temperature in the warm belt of Gulf Stream slope, which brought immediate death to so many of its inhabitants.† The Tile-fish, however, though it has disappeared from its original locality, or the area wherein it was first observed, is not extinct. In 1892, Col. Marshall McDonald, the Commissioner of Fisheries, made another attempt to discover the fish, and was successful in finding it at five different stations, so that this Tile-fish is restored to the list

* Thompson, 'Nat. Hist. Vermont,' p. 142. Cf. Marsh, 'Man and Nature,' p. 115.

† Cf. Lucas, 'Rept. Nat. Mus.,' Washington, 1891, pp. 648-49.

of existent species of the North Atlantic coast.* A deep-sea Crustacean, *Munida iris*, was also very common on the Tile-fish grounds, so numerous, in fact, that it gave character to the ground; yet when the U.S. Fish. Co. steamer 'Albatross' went over the same ground two years later, the hauls of the beam-trawl showed that this species, formerly so abundant, was wanting. It is interesting to note that the bottom Crustacea suffered at the same time as the Tile-fish, and probably from the same cause.†

Sudden, severe, and protracted gales of wind are destructive to animal life. Birds by these agencies are frequently blown out to sea, and must perish in this manner in considerable numbers. Many such observations have been, and are still, recorded in the 'Zoologist.' An excellent account of this destructive agency in Scotland has appeared from the pen of Mr. W. Evans. In October, 1898, a severe easterly gale set in on the 14th of the month, and but for a temporary lull on the 16th continued without cessation till the morning of the 19th. A natural result of so protracted a gale from the direction of the open ocean was, of course, an exceptionally heavy sea in the Firth of Forth. Mr. Evans, searching for the effects of this galé, gives a graphic and detailed account of the destruction in animal life he found on the shores and beaches. Hundreds of the Cat- or Wolf-fish (*Anarrhichas lupus*) were cast up on the beach in the neighbourhood of North Berwick. On October 26th no fewer than two hundred and four were counted between the harbour and a point opposite the island of Fidra. The majority of those seen were from two to three feet in length. No forms of life fared worse than some of the Lamellibranchs. "Whole colonies of certain species must have been literally ploughed up and swept bodily away by the terrific ground swell, and after much tossing to and fro deposited in a dead or dying state on the gently sloping beach."‡ Sir H. Maxwell relates that during a "mighty gale" which visited Scotland on December 22nd, 1895, thousands of Rooks perished. They were killed by fallen trees, or blown from their roosts and dashed against the swaying boughs. From a rookery in Lord

* Cf. Goode & Bean, 'Oceanic Ichthyology,' p. 288.

† Benedict, 'Proc. U.S. Nat. Hist. Mus.' vol. xxvi. p. 245 (1902).

‡ 'Ann. Scott. Nat. Hist.,' 1899, pp. 6-11.

Stair's grounds in Wigtonshire there were collected the day after the storm the corpses of upwards of five hundred Rooks.* Cyclones in the Pacific islands have tended to the disappearance of some land birds. Mr. W. W. Gill, a South Sea missionary, once well known to anthropologists, writes: "Some years ago, for three successive seasons, cyclones devastated some of the islands of this group (Rarotonga). Consequently the 'Kakirori' (a bird larger than a Sparrow, with bright brown plumage), two species of which were once common, especially in the neighbourhood of the sea, was (it was believed) exterminated." †

With all allowances, however, it cannot be denied that by purely natural causes we can trace in our own time very much destruction in animal life, destruction slowly, surely and frequently leading to extinction. Just as we find in nature processes which make for the survival of the fittest; or, again, the perpetuation of new varietal forms that arise in a suitable environment, so we see other agencies tending to the utter disappearance of species which have reached their zenith in evolutionary adaptability. We may well study the death as well as the origin of species. We are apt to only observe the devices in nature by which many species survive, and often ignore the constant natural phenomena which doom so many species to destruction. The species, like the individual, has its limit in time, ‡ and may be said to only endure on nature's sufferance. Estimating these natural calamities in the past by the observation of those occurring in the present, the extermination of so many "missing links" is not a weakness, but a proof in the conception of evolution, the net result of natural causation.

[In 'Nature' for August 31st (p. 434) an onslaught has appeared in the form of an anonymous paragraph on our first contribution on this subject. It is stated that "the article is

* 'Memories of the Months,' p. 71.

† 'Jottings from the Pacific,' pp. 127-8.

‡ Prof. G. H. Darwin, in his recent Presidential Address to the British Association at Cape Town, remarked: "The degree of persistence or permanence of a species, of a configuration of matter, or of a State, depends on the perfection of its adaptation to its surrounding conditions. If we trace the history of a State, we find the degree of its stability gradually changing, slowly rising to a maximum and then slowly declining."

marred by several serious mistakes." For the correction respecting Marsupials we thank our unknown critic, but he has *omitted to mention* that the statements he controverts were not given as our own, but as a *verbatim* quotation from the writings of Mr. J. M. Tyler, Professor of Biology at Amherst College, Mass., and the quotation was given with exact reference to publication; not for new facts in distribution, but to show that author's attitude in regard to the question of "missing links." Any argument based on inaccuracies is of course beyond the pale of legitimate consideration; but we have little doubt that, like Prof. Tyler, our anonymous critic, who writes as "a man set under authority," must cry *mea culpa* himself.

We are also told that "minor errors, such as nummulitids for nummulites, are also noticeable." No mention is unfortunately made of the other minor errors, and certainly this "error" only exists in the imagination of our critic. The genus *Nummulites* belongs to the family *Nummulitidæ*, and the word "Nummulitid" is used, as it is usual to speak of one of the *Arachnidæ* as an "Arachnid." The term "Nummulitids" has been employed, to give one instance only, by the late Prof. Rupert Jones, who was at least a master on this subject. We do not deny that the term Nummulites may not be, nor is not frequently used, but certainly not without a capital letter as written by our very confident critic.*]

(To be continued.)

* The paragraph also contains a remonstrance against the method of editing this magazine in reference to Mr. Steele-Elliott's note (*ante*, p. 308) on the Lesser Horseshoe Bat, referred to by that writer as *Noctilio hipposideros*. It is urged that "the editor might have pointed out that *Noctilio* is not the generic title for these Bats." Our contributor doubtless chose a rather archaic genus in thus following the terminology of Bechstein; but how far in generic nomenclature is alteration compulsory in these pages? Our best and latest authorities, and those which we should undoubtedly follow ourselves, are Mr. Oldfield Thomas (*cf.* Zool. 1898, p. 97) and Mr. Millais in his 'Mammals of Great Britain and Ireland.' These writers are practically in accord as regards the nomenclature of British Bats, and, except in one or two instances, in disagreement with the generic identifications of Mr. Lydekker ('Handbook to the British Mammalia,' 1896). Our critic, to be logical, would therefore seem to advise that, at least as regards British Bats, the generic names given by Lydekker should be suppressed in our pages; a drastic method we have no intention to pursue.

NOTES AND QUERIES.

AVES.

Breeding Habits of the Great and Blue Tits.—With reference to Mr. Jourdain's note *re* the breeding habits of the Blue and Great Tits (*ante*, p. 309), asking for particulars of any instances in which a second brood has been reared, it may be stated that in this district (north-west Yorkshire) neither of these species appears to be double-brooded, or if so but seldom. Are even our resident birds as many-brooded in the north of England as one might infer from the literature on this subject?—E. P. BUTTERFIELD (Wilsden).

Late Nesting of Linnet (*Linota cannabina*).—On Aug. 17th my gardener called me to see a Linnet's nest with three eggs in a bush of the arbor-vitæ kind just in front of my drawing-room windows. The eggs were hatched out on Aug. 29th, and to-day (Sept. 9th) the young have just left the nest. I have known young Linnets to be in the nest in August before this, but never as yet in September. This species is unusually abundant here this year, and has twice built in my garden, for the first time in my experience. I may mention that, though this late nest is hardly a dozen yards from the house, I have never once seen the cock bird either on the nest or anywhere near it.—W. WARDE FOWLER (Kingham, Chipping Norton).

Breeding of the Crossbill (*Loxia curvirostra*) in Northamptonshire. Definite records of the breeding of this species in Northants are very scarce. The late Lord Lilford, in his work on the 'Birds of Northampton' (p. 204), mentions two pairs having bred at Deene in 1902, and birds have been killed during the summer months in other localities. It was therefore with the greatest interest that I received two young Crossbills for examination, which were picked up by a keeper underneath a fir-tree on March 28th, 1904, at Harleston Firs, on the estate of Earl Spencer. They had probably fallen from the nest, and were covered with ants. Fortunately the keeper noticed the unusual size and strength of the bill, and took the birds to a birdstuffer at Northampton for preservation. Mr. C. E. Wright, who kindly sent

the birds for my inspection, informs me that there were a good many Crossbills in the Firs during the winter of 1903-4. As Dr. Hartert has recently separated the English Crossbill (*L. curvirostra anglica*) subspecifically from the Scotch birds (*L. c. scotica*), a description of the nestling plumage may be of interest. Description: Basal half of lower mandible and greater part of upper mandible dark horn colour; anterior half of lower mandible and lower edge of upper yellowish white. Feathers of crown, cheeks, and nape have broad dark smoke-brown median stripe; rest of feathers grey, tinged with yellow, especially behind the eye and on the cheeks, and showing more grey on the nape. Throat, breast, and abdomen greyish white, tinged with yellow, with narrow smoke-brown median stripe to feathers. Scapulars and wing-coverts dark smoke-brown edged with ochre. Primaries smoke-brown, with very narrow ochreous anterior edges and tips faintly edged light brown. Secondaries more distinctly tipped with ochreous yellow. Feathers of back dark smoke-brown in middle, sides ochreous yellow. Tail wanting.—F. C. R. JOURDAIN (Clifton Vicarage, Ashburne, Derbyshire).

Late Nest of Yellow Bunting.—When out walking on the 27th of August, I came across a beautiful new nest of the Yellow Bunting (*Emberiza citrinella*) containing one egg. I returned to it on the 30th, and found four eggs, but no sign of the bird. However, on the following day I found the hen bird sitting on the nest. Considering that the elevation of this spot is nearly 600 ft., this seems to me a very late record, even for a Yellow Bunting. This bird does not winter in this locality.—T. THORNTON MACKETH (The Hall, Caldwell, Renfrewshire).

Notes on the Green Woodpecker (*Gecinus viridis*).—During the present year a pair of Green Woodpeckers utilized for nesting purposes an old excavation in a pollard willow, in which last year a brood of Wrynecks were reared. The nesting site being within a few yards of my house, I had ample opportunity for observation. When food was brought to the young by the parent bird it usually settled upon a limb of the tree growing upwards from the trunk several feet lower than the position of the nesting hole; it would then by a succession of backward jumps descend until it reached the trunk of the tree, and then climb upwards—a retrogressive movement I cannot call to mind with any other bird. A quantity of food is brought to the young at a time, but one more clamorous than the others would often receive all. The food is carefully placed (evidently by the action of the parent bird's tongue) well inside the throat of the young.—J. STEELE-ELLIOTT (Dowles Manor, Shropshire).

Egg-depositing by Cuckoo.—I am glad to see a note on above subject from Mr. W. Wilson, for previously we “Bradford Nats,” who have taken a great interest in this subject, somehow got the impression that the Twite (*Linota flavirostris*) was the favoured (!) foster-parent in Aberdeen. Mr. Wilson asks for information of the breeding of the Twite farther south. I might state that here we have the Twite as a breeding species on many of our moors, and we wondered how it was that the Cuckoo did not select them as in other districts. If you strike a moor with the Twite breeding thereon, you are certain to find a goodly number within a few hundred yards; hence we expect to find them in little colonies. Although I have found many nests of this species, I have never seen a Cuckoo’s egg in one; last year (1904) we received a report of one by a younger brother of Mr. Ruskin Butterfield, but we failed to locate it. Here the Meadow-Pipit (*Anthus pratensis*) is almost the only bird selected as the victim for the Cuckoo’s ill-mannered youngster’s early welfare, although in 1899 I found a Cuckoo’s egg in the nest of a Pied Wagtail (*Motacilla lugubris*), which seems to be about the exception to the rule. The Twite’s full clutch in early spring is usually six. On May 20th of this year I had the pleasure of the company of Mr. Forrest (of Shrewsbury) on a visit to a little colony of Twites breeding within half an hour’s walk of where I live, and he will be able to substantiate what I say, that Twites breed in goodly numbers near here, and that we have every opportunity of studying them.—W. H. PARKIN (Studholme, Shipley, Yorks).

Dunlin (*Tringa alpina*) in Surrey.—On Sept. 3rd I visited Frensham Pond, on the borders of Surrey and Hampshire. I was very pleased to see two Dunlins on the north side of the pond; they were very tame, allowing an approach of six or seven feet. Having plenty of time to spare, I watched them for a considerable time. Once or twice I approached too near, when, uttering their note “purre,” they flew twenty or thirty yards farther up the side of the pond, and quietly settled down to feed. They very often were knee-deep in the water, and sometimes when the water came up higher than usual, there being a strong wind, they would fly up and retire a little way on to the sand, only to run forward again and repeat the performance. Both birds were in good condition, and seemed quite at home with their surroundings. I might also mention that the Great Crested Grebes (*Podiceps cristatus*) have bred last year, and again this, and at the time of writing have five young ones, which are nearly as large as their parents.—L. B. MOURITZ (6, Esmoind Road, Bedford Park, W.).

Dusky Redshank in Kent, Squacco Heron and Icterine Warbler in Sussex.—On May 29th, 1905, a fine pair of Dusky Redshanks (*Totanus fuscus*), in summer plumage, were shot at Jury's Gap, Lydd, Kent. On June 3rd, 1905, a fine male Squacco Heron (*Ardea ralloides*), in full plumage, was shot in a grass-field near Rye, Sussex. On June 26th, 1905, a beautiful male Icterine Warbler (*Hypolais icterina*) was shot at Peasmarsh, about three miles from Rye, Sussex. The above were all brought to Mr. Bristow, of St. Leonards-on-Sea, to be set up, and are now in my collection.—J. B. NICHOLS (Parliament Mansions, Westminster).

Additional Notes on the Birds of Richmond Park.—

SPARROW-HAWK (*Accipiter nisus*).—Sometimes seen, although but rarely. It is probable, however, that there is at least one pair resident in the park.

JAY (*Garrulus glandarius*).—Since writing my previous notes I have seen this bird on three occasions. There are at least half a dozen pairs, which are generally to be seen or heard in the pond or Isabella plantation.

REDWING (*Turdus iliacus*).—An unfrequent winter visitor.

GARDEN-WARBLE (*Sylvia hortensis*) and CHIFFCHAFF (*Phylloscopus rufus*).—After further observations I find that these birds are not so common as I formerly stated; in fact, the former bird seems to have disappeared this year, whilst I have only heard the latter on three or four occasions.

NIGHTINGALE (*Daulias luscinia*).—This bird, although fairly numerous in different localities which border the park-walls, is very seldom found in the interior. Sometimes I have heard them in the Isabella plantation, but this year they seem to have deserted even this situation.

MEADOW-PIBIT (*Anthus pratensis*).—I might add to my former note on this species that it is essentially a winter visitor, seldom being seen during the summer months.

TREE-SPARROW (*Passer montanus*).—This species is more numerous of late, and I believe that a pair bred this spring in the willows on the island. On several occasions I saw birds, after feeding on the refuse at the side of the pond, fly on to the island.

BULLFINCH (*Pyrrhula europaea*).—Although, as formerly stated, I have no record of this bird, two of my friends have observed the species. It must therefore be ranked as an occasional visitor.

REED-BUNTING (*Emberiza schæniclus*).—Since writing my note on this bird (*ante*, p. 187) I have found that there are a pair, and I believe they bred in the bracken near the east corner of the smaller pond.

LITTLE GREBE (*Podiceps fluviatilis*). — On April 23rd I and three friends saw a Dabchick on the larger pond. Returning about an hour and a half later I could find no trace of it. One of my friends told the headkeeper about this, who said it was an extraordinary thing, but for the last three years a Dabchick, presumably the same bird, had been seen on the ponds for an hour or two, sometimes for a day, towards the end of April or the beginning of May. Surely this is curious!—L. B. MOURITZ (6, Esmond Road, Bedford Park, W.).

CRUSTACEA.

Remarkable Lobster-claw.— On Aug. 17th a local fish-hawker named Jerrard, who supplies me with many strange fishes and



crustaceans, brought me a pincer-claw of the Norwegian Lobster (*Nephrops norvegicus*), locally known as the Norway Shrimp. As will be seen by the photograph, the malformation is of a most extra-

ordinary kind, an extra chela growing as it were distinctly out from the claw between the fixed and free-working points, ending in a V-shaped extremity. The Lobster was an adult specimen, and had not recently cast its "shell," as may be inferred by the presence of numerous acorn barnacles comfortably affixed to the claw. I might add that this species is now being largely brought into this port by trawlers from the vicinity of the Dogger Bank and "the other side"; certainly tons have been sold here this summer for purposes of food, the public having learned to appreciate its delicacy; they run from a halfpenny apiece to three-halfpence. When stacked, tier upon tier, on our fishmonger's slabs, their quaint and pretty forms attract the eyes of the passer-by. Eight inches from rostrum to the end of the tail is about the length of a full-grown specimen. It is rare on the eastern seaboard; I have but one undisputable record of its occurrence in my particular district, but have found it packed in the stomachs of deep-sea Cods.—ARTHUR H. PATTERSON (Ibis House, Great Yarmouth).

Correction of Misprints (Zool. August, 1905, p. 313).—For *cairns* read *caves*, last line; for "*different people's*" read "*different peoples*"; for "*Dalnaglas*" read "*Dalnaglar*," fifth line from foot. — J. A. HARVIE-BROWN (Dunipace, Larbert, Stirlingshire, N.B.).

THE ZOOLOGICAL SOCIETY'S GARDENS.

To the general public the most attractive addition to the Zoological Gardens during August was a female Gorilla, brought from the Gaboon, and deposited by Mr. J. D. Hamlyn. She is probably about five or six years old. She has proved no exception to the rule that these Apes are a source of the greatest anxiety to those who have charge of them, for although apparently healthy and in good condition she refused to feed for the first few days after being placed in the Apes' House, and after a great deal of tempting with all manner of delicacies took at the end of that time nothing more substantial than a few grapes and oranges. By the time these lines appear in print she will be on her way to America, having been bought by the Director of the New York Zoological Gardens. To the collection of Ungulates have been added two young male Red Deer, born in the menagerie; a pair of Dorcas Gazelles, adult and in perfect condition, deposited by H.M. the Queen, and a young pair of West African Marsh Buck

(*Limnotragus gratus*), brought from the Gaboon, and deposited by Mr. J. D. Hamlyn. Both are of a rich chestnut-red and marked along the sides from the shoulder to the rump with about nine white stripes and with many white spots as well upon the hindquarters. The male has as yet no trace of horns, and is in all respects like the female. In the event of the animals staying in the Gardens, it will be interesting to note the gradual change of colour of the male to the smoky-brown characteristic of the adult.

The great event in the bird line during August was the completion of the large new Aviary for Sea Gulls. This occupies the area between the Seal Pond and the Pigsties. The opposite face of the rockwork in the Seal Pond is included within the wirework, and forms a natural-looking cliff for the birds to perch and nest on. Trees are left growing in the Aviary, which rises to a height of about thirty feet. There is a large pond running nearly its whole length along the front, and a smaller one at the back, the banks of both being fitted with ornamental rockwork. Here may be seen Sea Gulls, Cormorants, Herons of various sorts, Gallinules, Kestrels, and Choughs. It is especially hoped that the Choughs, including both the alpine and Cornish species, may breed on the rockwork next spring.

In a previous number of the 'Zoologist' reference was made to a recently established community of Burrowing Owls and Prairie Dogs. The pair of Owls has successfully reared a young one, which, when about half-grown, appeared at the entrance of the burrow under guard of the parents, who fiercely drove off every Prairie Dog that ventured too near. The protective vigilance displayed by the Owls suggests fear for the safety of the young if left to the tender mercies of the rodents; and the greed with which the latter fight over and devour the dead rats or fowls' heads put in the enclosure for the Owls shows that the fear of the old birds has probably a strong foundation in fact. It is interesting to record that the Owls themselves have a liking for the Prairie Dog's food, and may not infrequently be seen eating the cabbage-stalks with which the rodents are provided.

All the eggs laid by the Struthious birds this season in the Gardens proved infertile after trial in the incubators. Ample amends for this disappointment, however, have been made by the Common Rheas. The cock bird, after "sitting tight" for the proper time, hatched out eight young ones in the small enclosure set apart for these birds, an event which has not occurred in the Gardens for over half a century. He started by sitting upon a few eggs, and the hen subsequently laid the remainder of her stock within his reach, and these he pulled

beneath him with his wings. The brood is now about three weeks old, and seems likely to flourish.

Amongst the many reptiles deposited by Mr. Rothschild, some Snakes from the Gaboon stand out as of peculiar interest, namely, two very fine examples of the Nose-horned Viper (*Bitis nasicornis*); also an equally large example of a second species of the genus, namely, *Bitis gabonensis*, not previously exhibited in the Gardens. There is also a large West African Cobra (*Naja melanoleuca*). The specimens of *Bitis*, though deadly and, to many, repulsive to look upon, cannot but excite admiration on account of the exquisite beauty of their colouring; while an admirable instance of warning coloration is furnished by the Cobra with his dorsal surface jet-black, and his throat and neck yellow with jet-black stripes, the prevalent uniform and badge of poisonous animals. This is displayed to full advantage as the Snake stands facing his adversary, with hood erect, in his characteristic attitude of self-defence.

R. I. P.

OBITUARY.

JOHN WILLIAM DOUGLAS.

FULL of years, and having outlived his zoological contemporaries, the oldest contributor to the 'Zoologist' passed away on August 28th, at Morningside, Craven Park, Harlesden. He had reached the age of ninety-one years, and was the author of some dozen contributions to the first volume of this magazine, published in 1843.

It is as an entomologist that Douglas will be remembered, and as one belonging to the last century, for he had during recent years lived in retirement, and outside his closest friends had been little heard of. He was perhaps one of the last collectors to see a living *Chrysophanus dispar* in this country, which he did at Whittlesea Mere in 1841. He joined the Entomological Society in 1845, and became Secretary in 1849, when the Society was in considerable financial difficulty, and was described by Stainton in a Presidential Address as "an efficient Secretary of good *business habits*."

EDITORIAL GLEANINGS.

WE have received the Annual Report of the Indian Museum for the year 1903-1904. In the Natural History section we read that "The most momentous event of the past year has been the receipt from the Government of India of a grant of five lakhs of rupees for the general improvement of the museum: among other things the grant provides for the purchase of land for, and the construction of, much-needed outhouses and conveniences for museum servants."

The following paragraph is of more than purely Indian interest:—"Among other radical proposals that have disturbed the Zoological Section is that of the Director of the British Museum (Natural History) that all the Indian Museum 'types' should be transferred to the great central institution under his charge. It is the opinion of the authorities of the British Museum—an opinion which in itself is most reasonable—that the climate of Calcutta is inimical to that enduring preservation which 'types' demand, that the isolated situation of Calcutta renders our 'types' as objects of reference almost useless, and that therefore the interests of science would, in every way, be advanced by the transfer of the 'types' to the chief working centre of the British Empire. The Trustees, however, so far as the types received from the Asiatic Society go, were debarred from agreeing to the proposal, and, outside their obligations to the Asiatic Society, were disinclined to consent to it, for fear of handicapping workers in India."

IN the Seventeenth Annual Report of the Delegates of the University Museum (Oxford) for 1904, we read in the statement of the Hope Professor of Zoology that an important acquisition to the entomological collection has been acquired in the splendid collection of Oriental Hymenoptera, containing large numbers of types, bequeathed to the Department by Mr. G. A. James Rothney, F.E.S., together with his fine British collection of the same order, the manuscript notebooks relating to the collections, and the parts of his library dealing with this group of insects.

We quite agree with the remark that "when the Rothney Collection

of Hymenoptera is added to the collections of W. W. Saunders, Sir Sidney Saunders, F. W. Hope, J. O. Westwood, to the numerous types of Frederick Smith, and to the large number of accessions registered in these reports during the past ten years, the most interesting of all the orders of insects will be represented in Oxford by one of the great collections of the world."

THE following important additions have been made to the menagerie of the Zoological Gardens, Giza, near Cairo, Egypt, by the members of the staff of these gardens who left Cairo for the Sudan on May 10th last, and returned on August 10th with the following live animals:—One very fine young female Giraffe (*Giraffa camelopardalis*) from Kordofan, deposited by H.H. the Khedive, three African Elephants, fifteen Sudanese Lions, one Libyan Cat (*Felis ochreata*), three Genet-Cats (*Genetta dongolana*), three White-tailed Mongeese (*Herpestes albicauda*), two Zebra Mongeese (*Crossarchus zebra*), one Pale Fox (*Canis pallida*), one Ratel (*Mellivora ratel*), one Black-nosed Red Monkey (*Cercopithecus patas*), one White-nosed Red Monkey (*C. pyrrhonotus*), one Grivet Monkey (*C. aethiops*), one Æthiopian Hedgehog (*Erinaceus aethiopicus*), four Ground-Squirrels (*Xerus erythropus*), five Korin Gazelles (*Gazella rufifrons*), two Oribi (*Ourebia montana*), two Addax (*Addax nasomaculatus*), one Sabre-horned Antelope (*Oryx leucoryx*), one Darfur Ram (*Ovis aries* var. ?), one Ælian's Wart Hog (*Phacochoerus africanus*), one Fish Eagle (*Haliaeetus vociferus*), one Eagle Owl (*Bubo cinerascens*), two Senegal, or Saddle-billed, Storks (*Ephippio rhynchus senegalensis*), one Sacred Ibis (*Ibis aethiopica*), three Golden-crowned Cranes (*Balearica cecilia*), three Egyptian Geese (*Chenalopeus aegyptius*), three Spurwing Geese (*Plectropterus rueppelli*), three Ruffs (*Pavonella pugnax*), two African Green Parrots (*Palæornis docilis*), two Brown-necked Ravens (*Corvus umbrinus*), one Glossy Starling (*Lamprotornis porphyropterus*), one Blue-naped Coly (*Colius macrurus*), one Kestrel (*Falco tinnunculus*), three Long-tailed Doves (*Æna capensis*), two Red-backed Sparrows (*Passer rufidorsalis*), nine Yellow Sparrows (*P. luteus*), nine Indigo Finches (*Hypochara ultramarina*), four Bishop Finches (*Pyromelana franciscana*), ten Fire Finches (*Lagonostrieta brunneiceps*), one Weaver-Bird (*Hyphantornis taniopterus*), three Weaver-Birds (*Hyphantornis* sp. ?), six Crocodiles (*Crocodilus niloticus*), two Nile Turtles (*Trionyx triunguis*), three Terrapins (*Sternotherus adansonii*), two Leopard Tortoises (*Testudo pardalis*), one Waran Lizard (*Varanus ocellatus*). Total, one hundred and twenty-nine animals (*i. e.*, fifty mammals, sixty-five birds, and fourteen reptiles).

THE last male specimen of the half-wild Apes which once were fairly plentiful on the Rock of Gibraltar has died. As "Fergy" he was known throughout Europe. He was buried, writes a 'Daily Graphic' correspondent, with the utmost decorum, his family witnessing the sad ceremony from some little distance above. Throughout the following night their lamentations could be heard.

WE read the following paragraph in our interesting contemporary the 'Shooting Times' for Sept. 2nd:—"If the present conjecture prove correct, many Grouse will next year succumb to the ravages of disease. It is said that the deadly and dreaded complaint generally breaks out after a very good season; but, as nothing but the disease has much influence in reducing the stock of Grouse, and as disease comes periodically, it is natural that, when it comes, it should find a large stock, for the birds increase and multiply amazingly in its absence. It is curious that the disease always takes its course through the country in belts, often well defined on either side—so much so that one side of a burn has often been swept of the Grouse stock and the other has not been touched by the complaint. This afflicted belt has often extended for forty, fifty, and even one hundred miles, and the strange thing is that it has often jumped a valley of low ground, with no Grouse upon it for some miles, and extended its ravages to the hills upon the other side, still following the direction indicated by the first afflicted belt upon the other side of the valley. This, naturally, gave rise to the idea that the disease was carried in the air and breathed into the systems of the birds. But Dr. Klein, during his experiments in 1887, found the utmost difficulty in imparting the disease through the breath of sick birds, and could not effect it without enclosing the diseased and the healthy birds under a cloth together, and so leaving them for a night. It seems impossible to believe that contagion can be carried miles in the air that could not be carried from one bird to another in the free air of a room."

AN interesting tabulated statement has been issued by the Henley Fisheries Preservation Association showing the number of fish and ova it has placed in the Thames between December, 1882, and June, 1905. These amount respectively to 36,080 fish and 177,000 ova. Particulars are appended:—

YEAR.	KINDS OF FISH.	QUAN- TITY.	DISPOSED OF.
1883	Loch Leven ova	45,000	In River Thames in district, some left in Nursery.
	Trout of divers kinds, yearlings to some above 1 lb. in weight	222	All in the Thames—Mill End and Henley.
1884	Loch Leven ova	30,000	5000 fry in Loddon, rest in Thames from Shiplake to Hurley.
	Trout of divers kinds, yearlings to some 2 lb. in weight ..	305	All in River Thames—Shiplake to Hurley.
	Loch Leven Trout, yearlings and two-year-olds	525	All in River Thames—Shiplake to Hurley.
1885	Loch Leven ova	20,000	Lost by flood and mud silt, except 1500 put in Loddon.
1886	Loch Leven ova	20,000	Part in upper water of Hambleton Brook (again flowing)*; rest in Thames and Loddon.
	Loch Leven ova (second supply)	15,000	5000 left in Nursery to grow into yearlings; rest in Thames.
1887	Loch Leven ova	15,000	All in River Thames near Henley.
	S. Fario ova	15,000	About one-third in new Nursery, Colstrop; remainder in Thames at and below Mill End.
	Grayling fry	2,000	All in Loddon.
1888	Bream—Brown or Golden (large)	90	In Thames at Greenlands and Bolney.
	S. Fario ova	12,000	In Loddon, 3000; remainder in Thames.
	S. Fario yearlings and two-year-olds	200	All in Loddon.
	S. Fario yearlings, Loch Levens and two-year-olds (a few) ..	1,522	All in Thames—Mill End and Marsh.
	Grayling fry	5,000	All in Loddon.
1889	Loch Leven fry	5,000	All in Thames between Shiplake and Henley.
	Bream, ½ lb. to 2 lb.	120	Thames, at Bolney & Greenlands.
1890	Two-year-old Fario, extra large	126	At Hambleton.
1891	Large yearlings, Fario	750	Between Henley & Medmenham.
	Fry (Loch Leven)	6,000	Between Henley & Medmenham.
	Loch Leven, selected two-year-old fish	200	Between Henley & Medmenham.
1892	Loch Leven yearlings	700	Between Shiplake and Hurley.
	Fario (two-year-old selected) ..	300	Between Shiplake and Hurley.
1893-4	Fario, 9-in. to 12-in.	400	Henley Bridge, Hambleton, and Medmenham.
	Tench	400	Henley Reach.
1895	Carp	400	Henley Reach.
	Fario (two-year-old), 9-in. to 11-in.	400	Hambleton and Medmenham.
1896	Fario—selected two-year-old ..	450	Henley and Medmenham.
1897	Fario—selected two-year-old ..	200	Henley and Medmenham.
1898	Fario—selected two-year-old ..	400	Henley and Medmenham.
	Roach, Perch, and Tench—large	300	Henley Bridge.

* This brook (Hambleton), which failed in 1884 and began to flow again in March, 1896, was so strong as to wash over dams and screens, and most of these fry went down into the Thames.

YEAR.	KINDS OF FISH.	QUAN- TITY.	DISPOSED OF.
1899	Fario—good yearlings	1,000	Marsh to Medmenham.
1900	Tench, Carp, Roach, Rudd, Perch, and Bream	3,670	Henley to Greenlands.
1901	Fario—select. large two-year-old	500	Marsh to Medmenham.
1902	Carp, and a few Roach and Perch	2,100	Henley Bridge.
1903	Bream—Brown, from 5½-in. to 13½-in. in length	1,500	Henley Reach.
	Trout—Fario, selected large two- year-old, up to 11½ inches ..	700	Henley Reach.
1904	Trout do. do.	350	Henley Reach.
1905	Trout do. do. up to 14½ inches	250	Henley Reach (100 marked with numbered tablets).

(‘Angler’s News and Sea Fisher’s Journal,’ Sept. 2nd.)

WE have received a reprint of a most interesting paper on “Land Mammals of the Clyde Faunal Area,” written by Mr. Hugh Boyd Watt, and published in the Transactions of the Natural History Society of Glasgow. There are some details respecting the White or Park-Cattle (*Bos taurus*):—“This semi-domesticated species has been kept in the following places in our area, *viz.*, Auchincruive, Cadzow, Cumbernauld, Ardrossau (and Eglinton Castle?), Kilmalcolm, and Kilmory (Lochgilphead). The sole surviving herd is at Cadzow, the numbers of which, as the undernoted figures show, are well maintained:—

Date.	Total Number of Animals.	Authority.
1835, ...	80 (about)	New ‘Statistical Account’—Lanarkshire, p. 278.
18th July, 1877, ...	56	A. H. Cocks. ‘Zoologist,’ 1878, pp. 282-3.
1880, ...	40 (over)	Alston’s ‘Mammalia’ (p. 25), <i>auct.</i> Storer’s ‘Wild White Cattle’ (1879).
22nd Aug., 1887, ...	60	Report of Committee of the Brit. Association. ‘Zoologist,’ 1887, p. 403.
1888 to 1890, ...	48	W. Hannan Watson.
7th May, 1898, ...	42	H. B. Watt.
7th Oct., 1899, ...	44	H. B. Watt.
1900, ...	49	‘Scots Pictorial,’ 15th Oct., 1900, p. 301.
11th Apr., 1902, ...	53	H. B. Watt.
3rd Oct., 1903, ...	71	H. B. Watt.

In 1886 fresh blood was introduced from Chillingham, and in 1898 one bull and four cows were brought in from Vaynol Park, Carmarthen-

shire, for cross-breeding. The original stock at Vaynol was from Kilmory, and consisted of twenty-two animals transferred previous to 1897. The Kilmory herd was raised, previous to 1845, from a white bull (which was understood to have come from that portion of the Blair Atholl stock which had gone to the Earl of Breadalbane in 1834), and from white or dun Highland cows. The last of the Kilmory beasts were disposed of in 1903. I can add nothing to the account given by Mr. J. E. Harting ('British Animals extinct within Historic Times,' 1880) of the Auchincruive and Ardrossan herds. The animals, which were at Kilmalcolm previous to 1845, were brought from Eglington, and were probably the same stock as the Ardrossan ones. The historic 'quhit bullis' of Cumbernauld mentioned by Boece (A.D. 1527), Bishop Leslie (1578), and Monipennie (1597), if not entirely destroyed by the Earl of Lennox in 1570, may have some connection with the Cadzow herd, the origin of which is not known."

WE are informed that on August 4th a pure white Ringdove with pink eyes was shot near Scarborough, the only one on record there. A Pied Stockdove and a Yellowhammer have also been obtained at same locality. The three birds are now being preserved by Mr. John Morley, King Street, Scarborough.

FROM the Magyar Ornithologiai Központ, Hungarian Central Office of Ornithology, we have received a communication on 'The Economical Importance of the Rook (*Corvus frugilegus*, L.) in Hungary,' by Titus Csörgey, Adjunctus of the Institute. From the examination of the contents of four hundred and seventy stomachs of these birds a number of valuable conclusions have been arrived at.

The Rook feeds principally on insects and mice, but from spring to autumn, and on cold wet days of the warmer season, it also subsists on vegetable food.

During spring and autumn sowing time it picks up the seeds lying on the surface or those not sufficiently covered, as it does, in some parts, with the feeding-corn sown by machine. This damage is insignificant, leaving hardly any traces in the sprouting seeds. In some parts it preys on the ripe ears, without, however, doing great harm; this occurs chiefly when there is a great drought, when the pastures catch fire, and when, therefore, there is no sufficient supply of insect-food.

That it also exercises in regard to cattle-rearing an extremely

important activity is proved by the observations of Béla v. Hauer, an estate owner. He tells us that the Rook, on the pastures, not only frees the domestic animals from their external parasites, but that it pulls the *gastrus larvæ* from the exposed anus of Horses, and that it picks also the "proglottidæ" of *Tania cœnurus* from the dung of shepherd's-dogs, thus limiting the spreading of the staggers of Sheep.

Game-raising is in no way compromised by the Rook; and it thus differs from *Corvus cornix* and *corone*. It never attacks young Hares, and never destroys birds' eggs. It has been proved by experience that small game and singing-birds multiply even in the neighbourhood of strong colonies.

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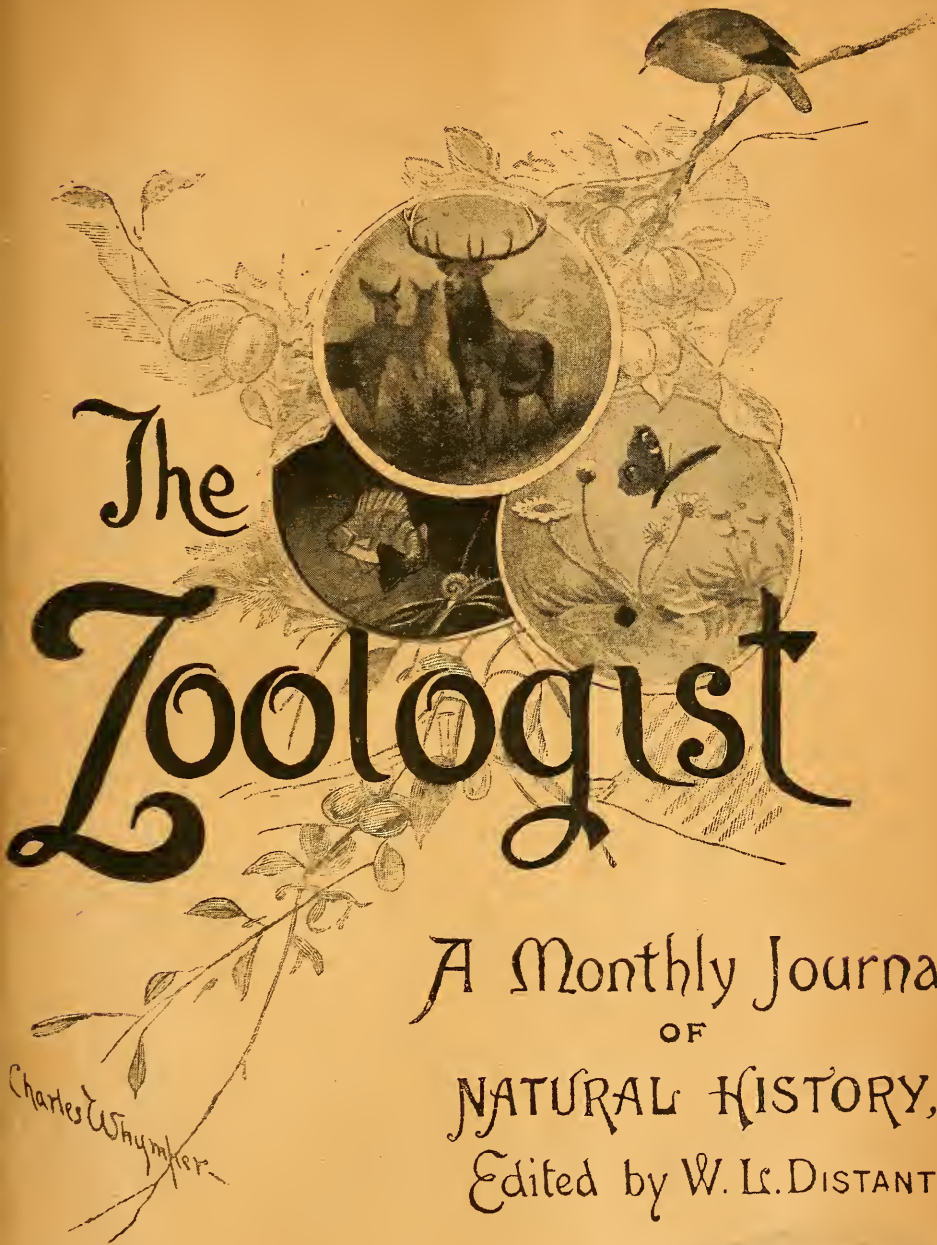
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THE ZOOLOGIST

No. 772.—October, 1905.

NOTES ON THE NEWFOUNDLAND SEAL FISHERY IN 1905.

BY THOMAS SOUTHWELL, F.Z.S.

THE Newfoundland sealing in the past season has been in many respects peculiar, and from a commercial point of view disappointing. For some years past it has been evident that the killing of the young Seals has taken place too early, and that, had they been allowed to remain a few days longer upon the ice, so rapidly do they increase in weight, the same number of "Whitecoats" would have yielded a greatly increased weight of fat. In my notes for the season of 1901 I showed that, owing to the whelping having taken place that year rather later than usual, whereas the killing commenced at the accustomed time, the pelts and fat averaged only 35 lb. as against a possible 60 lbs., and that a comparison with the yield of a like number of Seals in the previous season showed a loss of 165 tons in weight. Thus the destruction of an immensely larger number of young Seals was necessary to make up the weight of a full cargo.

This state of things became more and more apparent, and, with the consent of all the owners, it was agreed that in the past season the departure of the steamers should be delayed until 8 a.m. on March 13th, instead of the 10th as heretofore, and that no Seals should be killed till the 15th. As it happened, the first Seals were actually killed on March 16th.

The result, although not meeting with universal approval, and, as will be seen, occurring under rather unfortunate and peculiar circumstances, cannot be regarded otherwise than with satisfaction in one respect, for the yield in the past season shows an increase in the net weight of the produce of a like number of Seals compared with that of the season of 1901 of no less than 779 tons. No objection is made to the delay in the date of killing, but it is contended by some experienced sealers that the vessels should be allowed to depart on March 10th, as formerly, thus affording a longer time to search for the Seals, and enabling the slower vessels to come up before the patch, when found, is wiped out. It is to be feared, however, that the presence of the waiting vessels in the immediate neighbourhood of the Seals would have a very disturbing effect, as was the case in the Greenland fishery, not to mention the temptation it would offer to a solitary vessel to evade the statutory regulation.

The tendency of late has been for the steamers to select the more northerly ports as their points of departure; sixteen of the vessels in the past season left Greenspond, and only two sailed from St. Johns, the two Gulf sealers, as usual, making Channel (Port-aux-Basques) their starting-place. The practice has been to steer N.E., hoping to meet the whelping ice in its southward drift. This in the past, as on many other occasions,* has had an unfortunate result, for, owing to the prevalence of N.W. winds, the pack was driven rapidly southward and seaward, so that the Seals were really much farther south than usual; in addition to which many of the vessels got jammed in the ice until too late to participate in the killing, thus accounting for the pooriness of the return. The main pack was found about 130 miles E.S.E. of Cape Freels.

A fact worthy of note is reported by the 'Diana.' On March 29th she came upon a patch of Seals estimated at 600,000; the ice, however, was so closely packed that it was impossible to get near them. Eventually the ice opened after a storm of wind, but only a few were obtained, the young Seals having taken to the water. These Seals, it is said, were different in many respects from the ordinary Harps, "the flippers being longer and broader," and old sealers, who are very keen to note even

* See notes for 1897, pp. 69, 70.

slight differences, said "they were the northern patch, which is seldom if ever cut up." One would like to know more about these northern Seals, and other departures from the normal, of which we have heard before. (See 1893, p. 128, and 1897, p. 71.)

Twenty-two steamers took part in the last season's fishery, the fleet being increased by the return of the 'Neptune,' a vessel of 465 tons net, which was absent in 1904. The result was 177,100 Seals, very unequally distributed, only three of the twenty-two vessels having more than 15,000; the 'Eagle,' the first to return, only fifteen days out from St. Johns, leading with 32,064, and the 'Southern Cross' making out with only 883. Two others had more than 10,000, and the remaining seventeen vessels mostly considerably below that number, the average for the whole being 8050, only seven of the vessels being above that number and fifteen below it. The total net weight of produce was 4189 tons, valued at £62,234.

The 'Eagle' was very fortunate in falling in with the young Seals; at first she ran N.E., but found nothing, and, the signs indicating an entirely different location of the main patch from that of former years, she ran south; and on March 16th, 130 miles E.S.E. of Cape Freels, struck a patch of "Whitecoats," which extended for miles, and was quite undisturbed. On the first day 7000 were killed, the next day 16,000, and on the two following days 10,000 each. During three days she had a monopoly of the pack, but was then joined by the 'Kite,' the 'Labrador,' and the 'Ranger,' which shared in her good fortune. Capt. Jackman describes the weather as intensely cold, and fifty of his men were badly frost-bitten; but there was a remarkable absence of snow, which is essential to the well-being of the young Seals, and they were, although above the average in weight, not so heavy as they would otherwise have been. The other vessels had varying fortunes, but the great mistake seems to have been the time lost in searching for the Seals in too northerly a direction.

The two Gulf steamers were poorly fished, the 'Viking' having only 2280 old and young Hoods, and the 'Algerine' 6855 of the same. The 'Viking's' Seals were acquired under circumstances of great hardship. On March 15th she struck a

patch of Hoods, and killing began : but it was terrific work. The Seals, being far from the ship, had to be dragged for miles over the ice, the men making but one or two trips a day. This was off the Magdalenes. Capt. W. Batlett next tried to enter the Gulf, but about ten miles off St. Pauls met with a solid barrier of ice, and in attempting to force a passage the sheathing was torn off his vessel, and she "leaked furiously," and to such an extent that he had to bear up for home, the pumps going all the time. The 'Viking's' 1502 old Hoods and 778 young ones are said to be of enormous size, and weighed 146 tons 15 cwt. net, valued at 8972 dols., the hard-earned shares of the crew of 189 men being 15.82 dols. each.

The present is the twenty-fifth of these annual "Notes," and owing to various circumstances it is more than probable that it will be the last. Perhaps, therefore, I may be pardoned if I append a few statistics as to the results of the past quarter of a century's operations.

Formerly the sealing was prosecuted by means of nets set in the creeks and on the shore ; then followed shooting from boats, which in their turn were supplanted by small sailing vessels of from 40 to 100 tons ; these rapidly increased in number, till in 1857 Mr. Chafe informs us there were 400 of these vessels. The Seals must at that time have been very numerous, for in the year 1858 the large number of 507,624 were killed ; but the year 1830 had produced a still larger number, 686,836 having figured in the returns, which, however, fluctuated then as now very considerably. In 1863 steam was introduced, and the schooners rapidly disappeared, till at present very few take part in the fishery ; and it must be clearly understood that what follows will only refer to the results obtained by the steam fleet.

It was in the year 1876 that the 'Arctic,' a Dundee vessel, first represented the Scots in the Newfoundland sealing, their ships going north to the whaling at the conclusion of the voyage. In 1881 there were six of these vessels present, one of which, the 'Resolute,' killed 35,025 Seals in her first trip, and 5954, *i. e.*, 40,979 in all (she afterwards killed three Whales in Davis Strait). Twenty-two vessels took part in the fishery of that year, seventeen

of which made second trips, the whole resulting in 281,949 Seals. The largest number which had been brought in by a single vessel in her two trips was in 1875, when the 'Proteus' made out 44,377 pelts; but the record voyage for a single trip was made by the 'Neptune' in 1888, when she landed 42,242 Seals. In 1893 these destructive second trips were abolished, and fishing prohibited after April 20th.

The total number of Seals which fell to the steamers in the past twenty-five years was 5,624,071, the largest number in any one year—that of 1900—being 353,276, and the smallest 109,304, in 1893.* This enormous total does not include the Seals taken on the shore, by the schooners, or the large number lost by the wasteful system of "panning," which would greatly increase the total.

In the 'Field' newspapers of July 29th and Aug. 5th I have given the number of Seal skins, and the value of skins and oil exported from Newfoundland in the past fifty years, as published in the Board of Trade returns, by which it is shown that during that period the produce of sixteen and a half millions of these animals was exported from Newfoundland and Labrador, representing a money value of more than nine and a half millions of pounds; and yet during the past twenty-five years there seems to be no serious falling off in the average supply. I can only repeat the belief I expressed in the 'Field' article, before referred to, that the continued prosperity of this important industry depends largely upon its being judiciously regulated. In this respect great improvements have been made of late years; but seeing the risks of losing panned pelts from various causes, such as fog or bad weather, it must be prejudicial to kill more Seals than there is a fair prospect of getting on board in a reasonable time!

Warning should be taken by the fate of the Greenland sealing, which since the year 1895 has been abandoned by the Scottish steamers as unprofitable.

The great natural safeguards against extermination are the difficulty of approaching the patches of breeding Seals, and the

* These statistics are compiled from Mr. Chafe's circular, which, issued after all the vessels have made their complete returns, is the most reliable source.

practical immunity of the old ones. In the season of 1904, out of a total of 284,473 Seals killed by the steamers, only 5180 were old Harp Seals and 130 old Hoods. In this respect things are greatly improved. In some years, too, large numbers of the breeding Seals escape detection altogether, as has probably been the case in the past season. With these safeguards and careful regulations of the fishery, I see no reason to fear its early failure, and trust it may long remain the important source of revenue to the colony it is at present.

As on previous occasions, I have to express my best thanks to Sir Robert Thorburn and to the editor of the St. Johns 'Evening Herald' for their kind assistance.

A SUNDAY ON BREYDON.

BY A. H. PATTERSON, A.M.B.A.

THE spell of a quiet Sabbath evening is upon me. The faint clamour of the church bells to the eastward has died away, and the evening service has begun. The tide is out, and as I sit in the "well" of the old houseboat 'Moorhen'—now high and dry at her last moorings on a Breydon "rond"—a wide area of mud-flats, bare of water save in the shallowest of pools, in which the Dunlins can run thigh-deep, lie spread before me right away to the long monotonous bank of houses that, broken here and there by a steeple or a more ambitious chimney, represents the town of Yarmouth, whose only appearance of life, although teeming with Bank Holiday anticipating crowds, is exhibited in the smoke of an ice-factory, and the whiter output of a distant locomotive. The flats, richly coloured with the varying greens and browns of the prostrate "wigeon-grass" (the *Zostera marina* of botanists), and the "raw" (*Chatomorpha linum*), and the "cabbage" (*Ulva lactuca*), remind one somewhat of a sloppy hay-field. An hour hence and the distant lights will twinkle in the gloaming, and the glare of a holiday resort will make one thankful that there is one little isolated freehold conveniently far away from it, where restfulness and quietude are assured—where the tremulous notes of the Whimbrel and the mellow cry of a Curlew only break the stillness. In the middle distance runs a silvery liquid thread; it is the "channel," along which glide two or three white-sailed yachts, and an occasional wherry, the skipper of the latter, in these hard times, gladly enough throwing in a seventh day's passage to make up a poor six days' earnings. Such is Breydon, a salt-water broad so often described, and yet always so fascinating—to me, at least.

* * * * *

7 p.m.—At this moment there are a few blotches of cloud overhead, yellowing, reddening, purpling as they glide down-

ward to the eastern horizon; and below the setting sun stretch wave-like fringes of clouds, fantastically gilded on their topmost edges, and deepening into furnace-red as he sinks behind each ridge. The only birds on the wing are a few late-flying, family-bored Sand-Martins, and a restless Gull or two; while the only cries heard at this moment are the laughing "yah-yahs" of a Black-headed Gull, the "tweety-teet-teet" of a couple of Common Sandpipers, the petulant "lou-eet" of a Ringed Plover, and the calls of a flock of Lapwings on the marsh behind. Some of these "Pewees" have used the mud-flats to-day, a rather unusual proceeding with them.

I have just cleared away the tea-jug, the remnants of a loaf, and all that is left of a cream-cheese sent as a "tit-bit" by Banham, the marshman's kindly wife, who, herself content perhaps with the loneliness of a life on the marshlands, half pities the hermit who seeks even lonelier quarters from choice. A lump of steam-coal is glowering in the cabin-stove.

What a delightful and characteristic cry of the oozy wilderness is that of the Curlew! One yonder is probing and picking among the "grass"; a small Crab, a mudworm, an *Idotea linearis*, or a Shrimp in an adjoining puddle, all alike are fish in his net. I saw one fellow this morning toying with a Flounder he had whipped up at the end of his sickle-bill. It travelled no higher up it; he twisted and turned it round and round, flung it on the wrack, picked it up again, shook it, all the while knowing he could not hope to swallow it, nor did he try to; then he flung it away in disgust. Why is it the Curlew can never pass by a "butt"? The moment after he had thrown it down he ran to a worm-bore, and dragged out a rag-worm. See! how the fellow jumped! He had disturbed a clam, in passing on, that ejected a small jet of water as it sank to safer hiding. I have often been amused at the Curlew's nervousness.

Hearken! how's that for a concert? Twenty-two freshly arrived Curlews, all calling at once, now flew "upwards," coming in from seaward—upwards, *i. e.*, towards the Burgh end of Breydon. They may rest a while there on the flats, but more probably they mean to keep on. They were hard to count at close quarters until they obliquely opened out a couple of furlongs away, and thus made their counting easier through this

powerful old marine telescope. Handy old instrument! How many Spoonbills have I not watched through your lenses! That odd Curlew piped as his relatives went by, but remained. He means no doubt to stay a few days longer.

* * * * *

7.30.—The sun has dropped behind a purple cloud-bank; his glories are reflected upon a shoal of cloud specks that remind us of a flock of gilded sheep. The young crescent moon is high up in the heavens, and travelling along a wind-promising sky, that did not belie our forecast for the morrow. As we close the cabin doors several Curlews are excitedly “koi-koi”-ing overhead; they have been scared by a distant gun. A marsh-prowler had probably fallen in with some young Mallard. The watcher yonder, undoubtedly fuming in his houseboat, thinks differently. He cannot be in two places at once, and most probably is wondering whether that lot of Curlews “up’ard” had lost any of its members. Redshanks are piping on a flat, making a late supper, most probably of marine *Gammaridæ*, mixing with them, as likely as not, a few small *Hydrobiidæ* that hide under the prostrate “wigeon-grass,” and long for the rising waters. The clear double “pleu, pleu” of a Greenshank away to the right is answered by a fellow out there on the left. How loudly they pipe out their distinct and metallic call-notes! But those Curlews! they cannot forget it. We can hear them long after the doors are closed, and the clamour calls vividly to mind how as a boy I used, on a drizzly night during the autumnal migration, to slip out into the back yard at home and listen eagerly to the bewildered “sickle-bills” above the glare of the town lights, charmed and thrilled, too, by the key-whistled sort of note the Dunlins blew; and when the Knot and the Godwit, and now and again an unknown bird, joined in the chorus, that made some of the townsfolk shake their heads, and think of the spirits of the night.

* * * * *

Feeling considerably “run down,” on the afternoon of Aug. 5th I provisioned my punt, and started from Breydon Bridge to spend the Sunday and a night or two on my favourite Breydon. The flood-tide I was unable to catch, and the wind was dead against me. I pass over the mishap or two that befell

me; I had a terribly hard pull against that raging ebb, that blistered even my horny hands, and took two hours to accomplish a trip that I can usually sail in twenty minutes. My houseboat lies two miles north-west from the town, on a rond against Banham's farm. I tumbled into her, and very soon had a rasher of bacon frizzling over the cabin-fire, to the wonderment, perhaps, of a couple of Black-backed Gulls to leeward, who found it difficult to associate such a savoury aroma with their favourite carrion. The only unusual "callers" were the afore-mentioned Lapwings, which for some reason or other have, this August, haunted the adjoining marsh at night. It cannot be worms—it must be "Leather jackets" they are seeking, for they are not particular birds so long as plenty offers; and the larvæ of the *Tipula* are dainties Master "Hornpie" delights to eat.

* * * * * * *

Last night I slept well. The first visitor of the morning was a Pipit. How the Pipits and Wagtails of the year do like to hear the patter of their little feet on my white-topped cabin roof! I can assure them they are always welcome.

On opening the doors—quietly and slowly, as I always do, for one never knows what company one may have in front of him—I discovered scores of Common Gulls (*Larus canus*) and Black-headed Gulls. These were running about the flats, some but a stone's throw away. All were worming, and snatching up Shrimps and Gobies, and no one knows what else, for many young fishes are stranded when the tide falls; not that it matters much to the little "Eel-pouts" (Viviparous Blennies), Flounders, Gobies, Shore-crabs, and various other Crustacea, for some will wriggle into the ooze, or hide beneath the *Zostera*, and comfortably await its return. Not so well off are the "Whitebait" (tiny Herrings) and the juvenile Smelts, for after a short helpless wriggle, unless there happens to remain an inch-deep pool to hold them, they must succumb. No wonder the smaller Gulls are most industrious ramblers on the flats, and small wonder they are always so merry.

Half a mile beyond this scattered flock are a number of fine old Greater Saddle-backed Gulls, evidently unencumbered this year by domestic duties, for they have been here all the summer;

with them are some younger blotched and speckled examples. They are all busily turning over the wrack in search of Shore-crabs, and such chance fishes they may uncover. You can always tell when they are successful in their search, for a quick grab is followed by an uplifting of the head, and a tangle of weeds depend; in the bight of them some Crab or Flounder is held fast by the strong bill. A jerk or two and the Crab is flung clear, and is as quickly snatched up again, and crushed, to be swallowed with a self-satisfied shake of the head. I have examined the excreta of these Gulls; they usually sleep on the "lumps" at regular intervals, and leave them besmeared as with lime. In these white patches are small fragments of half-digested claws and carapaces. Here and there a big Gull has, after repletion, dropped down for a nap, waking for a moment now and again to adjust or readjust some refractory feather, or stretch a wing. I have a strong suspicion that some sharp-biting parasite has disturbed its nap.

A Shoveler-duck now flew past those Saddle-backs, and dropped into a drain. That bird was shot before the day was out by a gunner higher up. At the same moment a Cormorant, a far from common visitor to-day, is pottering about in Duffell's drain; he is after a Flounder or two for breakfast. The Gulls usually resent a Cormorant's intrusion, but to-day, for some reason best known to themselves, they do not.

Seventy Whimbrel, crying as they flew, passed by, and after a few evolutions up and down kept on, and only odd birds frequented the place all day. These came in from the north-east; mayhap they were high in the air, but these wide-spreading flats so attract passing migrants that if they do not intend to stay they seem compelled to drop within hail of their fellows; then away they go. It was not until the third attempt, and when they opened fan-like, that I could accurately count them. So large a bunch in August is rather unusual. We see more of them here in May.

Dunlins in small flocks, with which are associating a few Ringed Plovers and two or three Curlew-Sandpipers, fuss around, changing their feeding-grounds. Some of the Dunlins still retain much of the garb of summer, but they are mostly young birds of the year. A little way off are a few Redshanks and a solitary

Grey Plover, and a Greenshank sticking his stiff bill under the wrack, and job-jobbing at the *Gammaridæ*, that scuttle away with almost the alacrity of sandhoppers.

There has been a stranger about to-day; I cannot for the life of me make out what bird it is that produces that queer cry. The note is easily distinguishable, whether uttered alone or in chorus with other birds. What to liken it to I am at a loss to suggest. It is high-pitched; it is too loud for a Temminck's Stint; it is not musical like a Plover's; it is a triplicate note after the style of a Greenshank's; but differs from all I know. I heard it in those dark nights of boyhood—rarely, I will admit—but the note always troubled me, as it does to-day. I would give anything to know its author, but then the novelty would be gone. There it is again! I scan every bird within range, but to no purpose. I was just as puzzled for a long time by a Bullfinch that whistled in hiding; the charm was gone when I detected the fellow.

A Black-headed Gull has discovered a finger-thick Eel. How the fish, seemingly knowing its danger, wriggles! how the bird, unmistakably excited, shakes and pinches and runs about with it! It is not many moments ere another Black-head espies it, and gives chase. I follow the twain with my telescope, and they alight and squabble at the rond-edge near "Stone Corner." Flying, pursuing, shaking, dodging, the two birds settle again, and the original possessor still holds its own. Now he has half-swallowed it, when the Eel flings its tail round the red upper mandible and tightly twists itself, to the discomfort and annoyance of the bird, which runs about trying to shake off the coil. Down drops the Eel—he has it again. The Eel is becoming weaker, but still struggles, when the Gull by a great effort swallows it. But out pops the Eel's tail again, and the bird has to vomit the rest of it. The Eel is not smitten with its discovery, and again protests vigorously against a renewal of the experience. The Gull swallows it again, and once more ejects it; but on the third attempt, made desperate by another Gull coming up to investigate, the catcher gets it down, and, by holding his head high and straightening his neck, succeeds finally in imprisoning it. The swellings and writhings in the bird's neck, visible even to myself, could not have been comfortable to him; but I will vow that was not the first Eel he has tackled.

At last the Eel must have succumbed, for the Gull, assuming his ordinary freeness of deportment, walks deliberately to a puddle and sips with ease.

The prettiest birds upon the wing are the Little Terns. There are several about, both old and very immature young. Hither and thither, mostly with heads to wind, they fly, with bills pointed vertically downward, ready the moment those keen eyes detect a little Herring dashing about below to fall upon it, seldom to miss their aim; and when any small fry has been secured, away they go to the edge of a flat, where the youngsters, with the up-winged fussiness of Pigeon squabs, snatch at and catch the fish as it drops from the parental bill. The light, airy-winged creatures are beautiful to look at, and one is glad the month's extension of close-time (to all save Ducks) gives the fairy-like Tern a chance of passing south before the indiscriminate gunner has the opportunity for destroying such gems in feathers.

There are unusually few Herons about to-day. Two only at the present time are within view—one a bird of the year, the other, I should say, a "three-year-older." The latter I now saw strike an Eel in the "run" he is standing knee-deep in. The Eel weighs, I should say, at least half a pound, and, tightly gripping the lively fish, the Heron walks deliberately out on to the flat. For fully ten minutes that bird plays with it—plays, I say—but there is no doubt, in letting the Eel fall upon the "grass," in which it vainly tries to squirm, he is only endeavouring to get a better grip, and at each strike he pinches peevishly; a dozen times at least does the Heron drop that Eel, and as many times does he seize it again; now and then some filaments of weed blow, pennant-like, from his bill. I have seen a Heron thus engaged bullied and pursued by three or four less fortunate fellows, to finally lose it, having dropped its prey on the mud below, where it has promptly buried itself in the ooze, to the annoyance of all, and the great chagrin of one. Our friend yonder has no rivals, and at length, having knocked all resistance out of it, he bolts his prey, taking a sip in the same way the Gull has done; and having in all likelihood slightly "overloaded his stomach"—for he has been fishing for half an hour—he draws his head into his shoulders, lifts one leg, and takes a nap. The

rising tide comes well up his odd leg ere he awakes to resume his fishing.

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It is dinner-time, and the tide is at the full. The Redshanks, washed off the opposite flats, have betaken themselves to the marshes; the small birds restlessly pass and repass; the Gulls are on the wing fishing in the channel; there are drowned mice, bits of fish, and what not always borne upstream from the town. The Curlews and Whimbrel are preening their feathers and sleeping on the rond west of us.

A few Eels brought to us by an old Breydoner make a by no means unsavoury Sunday dinner, and the fry-pan is frizzling a merry tune. The steaming coffee adds to a pleasant aroma. I wanted some brother naturalist to have dropped in just then, for there are enough dainties for two, and a chat with a kindred spirit is refreshing. And there have been sufficient birds to be seen to-day to delight a dozen. After dinner I fling myself on the settles, throw a rug around me, and read myself into a refreshing sleep. I am like the Heron; I have my fill and take a nap.

* * * * *

When I awoke the tide had fallen, and the flats had again become bare, and a host of various Gulls were scattered all around, some asleep, some arranging their dainty plumage, and a few strolling about snatching up something towards a supper.

I had flung out a few minutes since some Eel-bones, a couple of small dead Eels, and an opened bloater which had become tainted. I knew if the Gulls did not find them the Crabs most certainly would. I was scribbling these notes, when suddenly a beautiful adult Common Gull wheeled round, pounced on one of the sections of an Eel, and bolted it. He next snatched hold of the bloater by the tail, when he was "flown at" by a couple of Black-headed Gulls. They all "spotted" me simultaneously, for I was writing not half a dozen yards away, with my face to the open doors. Down dropped the bloater, and a few yards beyond dropped the Gulls; one of the six Black-heads—for there were by this time gathered half a dozen—had a mouse-grey hood split on

the crown with a streak of white, and he had also a white chin. Two other adult birds were as white-headed as in winter, with the black ear-spots distinct and isolated. Another had a dark line running from each ear-spot to the crown; the others were blotched. So soon does the summer hood vanish after nesting-time in some. The Common Gull stood guard, so to speak, over the tit-bits, and both awing and afoot drove off the others each time they were bold enough to presume. I finally told them all to go with a flourish of my hand.

The Common Gull still sits there a short way off, loth to leave so dainty a morsel, and he may yet pluck up courage to dash in and snatch it away. I am going to take another nap.

SUPPLEMENTARY NOTES ON THE BIRDS OF
ANGLESEA.

BY T. A. COWARD.

IN the spring of 1905 I spent from April 12th to June 13th in Anglesea, for the greater part of that time making Rhos Neigr my headquarters. The village of Rhos Neigr is situated at the southern end of Cymmeran Bay, at the mouth of the Crugyll, a small stream which flows through marshy ground—saltings as it nears the coast—and separates the sand-hills upon which the village is built from the more extensive sand dunes and common which border the western coast to the strait which divides Anglesea from Holy Island. The sandy shores of Cymmeran Bay and of the coast to the south and south-east of Rhos Neigr are broken here and there by rocky outcrops, mostly covered at high tide and consequently rich in seaweeds, but in places above high-water mark, tidal stacks and islets, which are richly clothed in spring with sheets of *Scilla verna*, thrift, and sea campion. Llyn Maelog, a sheet of water five-eighths of a mile in length, lies close to the village; at its western corner there is a dense bed of reeds and bog-bean. In these reeds many of the migrants roost when they first arrive.

A few of the summer migrants had reached Anglesea in March—Wheatears and Chiffchaffs, for instance; a few Swallows had been seen, and no doubt some Sand Martins and other birds may have passed prior to April 12th. Fresh arrivals, however, of these birds, with the exception of Chiffchaffs, were noticeable in a locality which can support only a limited number of breeding birds, and I was able to watch for the advent of the species which usually reach us later in the season. There was, so far as I noticed, only one considerable "rush" of migrants (on the night of May 1st), but there were many fluctuations in the numbers of the incoming or moving birds.

In the early days of April the wind was chiefly in the west; we had very cold weather from the 6th to the 9th; about this

time the wind got round to the east, and on the 12th was blowing from the S.E. and freshening. On the 16th it blew strong from the N.E., and remained N.E. or N., variable in force, until the 20th, when it was lighter, and the weather much warmer; on the 20th the wind backed to the N. For the next few days the wind was off the sea, W. or N.W.; it fell on the 25th, and blew from the S. or S.W., freshening again on the 28th, and backing to the S.E. on the 30th, finally settling in the S. During the night it dropped, but continued gentle from the same quarter. On May 2nd the wind veered to N.W. and rose high, continuing thus until the 4th, when it veered to N.E., and next day to the S. After that we had warmer weather and westerly winds until the 12th, when the wind again got round towards the N., and later to the N.E. and E., where it continued until the 23rd. Then it backed to the N.W., W., and S.W., until on the 27th we had warm light breezes from the S., the month closing with gentle winds from the N.W.

These indications of the wind-direction roughly correspond with the observations made in Manchester, but as a rule the force of the wind, especially when off the sea, is stronger in Anglesea than further inland. Wind rather than temperature appears to influence the arrival of migrants and their movements after they have arrived; I have therefore only stated the most noticeable changes in the wind which might have influenced the arrival or departure of the various birds.

I was able to add eight species to the list of birds which occur in Anglesea or off the coast. One of these, the Fieldfare, is no doubt common in the winter; and the Goldeneye is likely to occur on the llyns, but we had not come across it before, not having visited the island at the right season. The Garganey is never a common duck, and I was lucky to see it; Wigeon we had heard of, but had not actually seen until this year. Mr. S. C. Cummings met with them first in March. The Woodcock may or may not have been a breeding bird, but, considering the time of year when I saw it, I think that it probably had nested. The Little Stint and the two Divers—Red- and Black-throated—were of course passing migrants, as were also the Yellow Wagtails, birds we have not previously met with in the island. Other species which we had seen before I met with in new localities or

in greater numbers than usual. I have not attempted to mention all the birds I saw, only referring to those about which there is something to add to what we have already published,* or to record movements of the migrants.

FIELDFARE.—On April 15th I saw a flock of perhaps thirty Fieldfares feeding in a field near Llechylched.

WHEATEAR.—Wheatears were already established when I arrived at Rhos Neigr; a male used constantly to sing from the edge of the terrace of the house in which I was staying. The nest was in a rabbit-hole in the sand-hills a few yards' distance from the house. On June 4th, when "Coch-y-bondhu" (*Phyllopertha horticola*) were swarming all over the dunes, I watched a female feeding her young with the beetles. Every few minutes she brought food to the hole, and though at times she brought caterpillars and once a small butterfly, the majority of her captures were chafers. The male once or twice brought food, but as a rule he mounted guard on the summits of the dunes and made a fuss whenever anyone appeared within sight. Mr. S. G. Cummings saw a male Wheatear at Llys Dulas on March 20th, and on subsequent days met with parties of four or five; on March 24th he saw about two dozen in a field at Bull Bay. I did not notice any fresh arrivals in April, except on the 17th, when I came across a party of six in a field near Llyn Penrhyn.

WHINCHAT.—On May 2nd there was a "rush" of migrants, mostly Willow Wrens. A male Whinchat was feeding in a field close to Rhos Neigr village: I did not see it there again. On the following day there were a pair on the Cefni marsh, where the Holyhead Road crosses the river: in this locality a few pairs nest. On May 7th a male was singing on the telegraph-wires where the railway crosses the common north of Rhos Neigr: it was probably a passing bird.

REDSTART.—The Redstart is an exceedingly rare bird in Anglesea; on May 16th a pair were in the one locality where we have noticed them, on the Beaumaris-Menai road, but they may have been there some days before I visited the spot.

WHITETHROAT.—The first Common Whitethroat was singing on April 28th; a few more arrived with the rush on May 2nd, and by the 5th the bird was generally distributed and abundant.

* 'Zoologist,' 1902, pp. 401-415; 1904, pp. 7-29; 1905, pp. 213-230.

I heard the Lesser Whitethroat singing at the old place between Beaumaris and Penmon in June.

BLACKCAP. — The Blackcap had reached the woods which border the Straits on May 3rd. Later I heard several in the woods at Llangefni and other places.

GARDEN WARBLER. — At Coed Cadw, near Llanfaes, a Garden Warbler was singing on June 12th. This is a locality where we have not heard the bird before.

GOLDCREST. — A Goldcrest was singing in the small plantation at Plas Maelog, near Rhos Neigr, on April 14th.

CHIFFCHAFF. — Mr. Cummings heard the Chiffchaff at Cemllyn Bay on March 21st, and on the 24th at Porth Wen; neither of these are localities where the bird would remain; but on the 25th he heard one in the trees at Llanfairynghornwy, where we have heard the bird before—one of the few localities in Northern Anglesea where it nests.

WILLOW WREN. — The Willow Wren was heard at Abersoch, in Carnarvonshire, on April 7th; on the 10th it was seen by Mr. Cummings near Chester, and on the 12th by Mr. L. Wilson Roberts at Barmouth. On the morning of April 14th I heard two singing in one of the few clumps of trees in bare Western Anglesea. Next day I found it was plentiful inland, and by the 16th Mr. F. Brownsword informed me it was swarming at Old Colwyn. Throughout the remainder of April Western Anglesea was full of Willow Wrens, there being many in all places where there are trees, and a few were in every hedge or fair-sized clump of brambles; there were certainly more than we have noticed later in the season, when the passing birds have moved, and only the nesting birds are left. Abundant though Willow Wrens were in April, their numbers were insignificant compared with the multitudes on May 2nd. On May 1st the wind (almost due S.) sank to a gentle breeze, and next day it changed to N.W. When I turned out on the morning of the 2nd, I found at once that there had been a decided "rush" of migrants during the night; every bush, every hedge, every clump of brambles in the fields, or patch which trails over the low turf walls, had one or more Willow Wren in it. Many of these birds were singing, but the majority were silently and busily feeding. I examined many with my glasses, but failed to detect a single Chiffchaff amongst them,

nor did I hear the note of this bird. Not only were Willow Wrens singing in the brambles and stunted thorns which grow beside Llyn Maelog, but numbers of them were moving about in the extensive reed-beds, singing and feeding.

Other migrants arrived with them; Common Whitethroats, Sedge Warblers, Cuckoos, Corn-Crakes, Swallows, and Sand-Martins were all in greater numbers on May 2nd than I had noticed previously; Dunlins, Ringed Plovers, and Turnstones were more abundant on the beach, and there was a fresh arrival of White Wagtails. On this day, too, I saw my first Swift and Whinchat.

The numbers of the Willow Wrens remained about the same for a day or two, but they soon diminished, and by the middle of the month all but the local birds had departed. On two occasions later I saw a Willow Wren singing from the top of the wire covering of a chimney in Rhos Neigr village.

WOOD WREN.—The Wood Wren is absent from the immediate neighbourhood of the western coast, so that I do not know when it arrived. I did not hear any in the woods which bound the Straits on April 25th, but there were many singing to the south and east of Llanfair P. G. on May 3rd. Two were in song in the woods at Llangefni on May 5th.

SEdge WARBLER. — On April 18th the first Sedge Warblers appeared in the reeds at Llyn Maelog; after that date a few sang daily and in the evening until May 2nd, when apparently the local birds arrived, for from that time the bird, which is abundant in the district, was common.

GRASSHOPPER WARBLER.—The Cefni marsh, where the Holyhead Road crosses the river, is a locality where we have several times heard and seen the Grasshopper Warbler. It was here, on April 25th, that a friend heard the bird singing; on May 2nd I found it in its usual place. The first bird I heard in Rhos Neigr was trilling on April 29th in a field enclosed for building purposes and allowed to run waste; I heard another here—perhaps the same bird—on May 15th, and one at Llangefni on May 18th. The bird is much less plentiful in this part of the island than in the east.

DIPPER. — In 1904 we added the Dipper to the list of birds which we had found nesting in Anglesea. I visited the spot

where I had found the nest, but saw no signs of the birds on the brook. On May 18th, however, I saw a Dipper on the river Cefni, just above the town of Llangefni. This part of the stream appeared to us to have more of the character of a Dipper's haunt than most of the slow Anglesea streams, and we had looked for the bird here before. I could not find any trace of a nest, although there were many suitable situations.

LONG-TAILED TIT. — The Long-tailed Tit is a bird we have seldom met with in the island. On May 5th I saw a single bird at Llangefni, but in the woods near Beaumaris I came across a number of pairs, and was informed by the gamekeeper that the bird is not uncommon in that locality.

COAL-TIT. — The Coal-Tit also occurs in these woods, but I again failed to find the Marsh-Tit.

CREEPER. — The Creeper is by no means uncommon in the woods to the north of Beaumaris. At Llanfugail, on May 27th, two pairs of Creepers had nests; one pair were building in a crack high up in a pear-tree in an old walled-in orchard, and another had built behind a notice-board on the church wall. The bird, when it visited the nest, alighted below the board and ran up the wall; when disturbed it edged out sideways, ran a short distance up the wall, and then flew off.

WHITE WAGTAIL. — Pied Wagtails, during the third week in April, were more abundant than I have previously noticed in Anglesea, though I have no doubt that most of the migratory birds had passed before that time. On April 14th I came across a migratory party of White Wagtails on the beach close to Rhos Neigr village, and from then until the end of May birds frequented this spot. Their favourite haunt was a strip of shingle bordering a sandy cove amongst the rocks. Here the drifted seaweed collects at high-water mark, and when it dries at low tides attracts numbers of dipterous flies and sandhoppers. At first the party consisted of some twenty birds of both sexes. They were very tame, and fed within a few feet of me when I was seated upon the shingle. The birds constantly chased one another, darting across the sand and shingle, dodging sharply to the right or left, and calling as they flew. Occasionally one of the male birds would utter a short snatch of song, very similar to the song of the Pied Wagtail. On the 16th I met with a single bird on the

river at some distance from the beach, and on the following day saw a dozen feeding in a field near Llyn Penrhyn; I followed these birds as they slowly worked their way across the common in the direction of Rhos Neigr; no doubt they were some of the same party. Until the 28th the numbers remained about the same, though at times the birds were scattered over the warren at some distance from their usual haunt; at other times they rambled over the rocks, sand, and shingle in the immediate neighbourhood of the village. By the 28th their numbers had gradually increased; I estimated that there were at least thirty or forty birds, but two days later I could only see a dozen. Possibly, however, some of the birds may have been feeding elsewhere. On the morning of May 2nd, the day when Willow Wrens were so abundant, I found that fresh birds had arrived; there were at least sixty in the usual spot. Two days later I came across four on the north shore of the island at Cemlyn. Towards the 12th the N.W. or W. wind got round to the N., and later, on the 13th and 14th, was easterly; on the 14th I could only find about a dozen birds, and four days later—easterly winds still prevailing—their numbers were further reduced to four or six. These few birds—I took them to be laggards—remained for ten or twelve days longer. On the 30th I could not find any about, and a single bird on June 2nd was the last I saw. Some of the hens had very little, if any, black upon the crown. Mr. O. V. Aplin, who saw the remnant of the birds, suggested that as they remained so late they were probably Arctic and not Continental birds. In the evening the birds roosted in the Maelog reeds at a short distance from their usual feeding ground.

GREY WAGTAIL.—On two occasions I saw the Grey Wagtail on the Cefni at Llangefni, and on June 12th saw a pair with young on a small stream at Coed Cadwr.

YELLOW WAGTAIL.—The Yellow Wagtail does not appear to breed in Anglesea; we have kept a sharp look out for it every spring when we have visited the island. It does, however, occasionally pass on migration. On April 18th a male was feeding on the marsh near Rhos Neigr, and a male and female were with a few of the White Wagtails on the warren near Llyn Maelog. On April 21st a male was feeding with the White

Wagtails on the beach ; on the two days between the 18th and 21st I did not see any Yellow Wagtails, nor did I see them after the 21st.

SPOTTED FLYCATCHER.—The Spotted Flycatcher was in the Straits on May 16th, but I cannot say when it first arrived, as it is not a common bird in Western Anglesea ; after that date I met with it in a few of its usual haunts.

SWALLOW and SAND-MARTIN. — Swallows arrived early in North-western England and North Wales. The first I heard of was seen by a friend, who assures me that he did not mistake the species, near Bodorgan on March 22nd. Following this came a newspaper report of one between Beaumaris and Pentraeth on April 1st. On April 7th birds were seen by reliable observers at Afon Wen and Abersoch in Cardigan Bay. The Swallow reached Cheshire about this time ; on the 9th Mr. Oldham saw it at Oulton ; on the 12th Mr. Cummings noted it at Chester, and other birds were seen near Congleton. On the 13th, when a cold and moderate breeze was blowing from the south-east, I saw three Swallows working against the wind, steadily flying across the country. Next day the wind freshened and blew more from the south ; a number of birds were flying up and down behind the shelter of a tall hedge, and occasionally resting on the brambles on the northern side of the hedge. Sand-Martins were fairly plentiful in Cheshire before I left—they had been there since March 29th, and had been seen at Abersoch, in Carnarvonshire, on April 8th—but it was not until the 15th that I saw any near Rhos Neigr ; half a dozen were flying over the waters of Llyn Penrhyn, where Swallows were fairly plentiful. On the 16th I saw no Swallows, but a few Sand-Martins were feeding over Llyn Maelog, and in the afternoon—the wind blowing strongly from the N.E.—I saw a party flying north-west along the shore, keeping low behind the shelter of the dunes. High easterly winds continued until the 20th, and both species in small numbers roosted nightly in the reed-beds, feeding by day over the lake. On the 20th the wind worked round to the N., and abated in force ; not a single Swallow or Sand-Martin was to be seen on the lake, and I only saw one—a Sand-Martin—all day. On the 21st, however, Sand-Martins were abundant again, and a few Swallows appeared. The numbers of both

species fluctuated a little until the 27th, when the wind had again risen and blew strongly during the night from the S.W. : on the morning of the 28th there were more than a hundred Swallows over the water. These appeared to pass on, and the next movement was on the day of the rush of migrants, the night of May 1st-2nd ; on the 2nd both species were plentiful. After this there were always a few birds about, but no great increase until the 14th, when I saw on the cliffs to the south-east of Rhos Neigr many small parties of both species steadily moving along the coast ; I saw no birds flying south. In the evening there were large numbers on the lake, while others were still passing on, crossing the sand-hills due north, as if making for the northern coast by the shortest route. These birds, however, may simply have been going to roost in the reeds round the Valley lakes. I noticed these northerly movements on the 19th and 21st, by which time the local Sand-Martins were busy at their nesting-holes ; small parties roosted in the reeds so late as the end of the month.

HOUSE-MARTIN.—It was not until May 19th that I noticed the first House-Martin, but I expect the birds—rare in Western Anglesea—arrived earlier in more inland localities ; by the 26th it was well established in several of the places where it nests.

LINNET.—Early in April I was much struck by the number of small parties of Linnets which continually flew twittering over the sand-hills and commons ; by the middle of the month the resident male birds were singing everywhere : these flocks were much in evidence until about April 19th, but on the 25th I noticed numbers roosting in the reeds, the males singing as they settled down for the night. Even in May, so late as the 24th, I saw a few of these flocks, and can only suppose that migratory Linnets pass along this coast.

CORN BUNTING.—During the winter the Corn Buntings which remain in Anglesea flock, but by the middle of April all these flocks had dispersed, and the characteristic song of the male was to be heard on every side. On May 1st, however, I noticed a flock of between twenty and thirty silent Corn Buntings, together with a few Greenfinches and House-Sparrows, flying along a hedgerow near Ty Croes. It seems probable that these were a

freshly arrived party, for I met with no other flocks in April or after this date.

JAY.—Again I did not meet with the Jay, but was informed by a gamekeeper on the Baron Hill Estate, Beaumaris, that in the spring of 1904 he himself shot one, and that another was killed in the Baron Hill woods by one of the other keepers; these were the only two he had ever heard of in Anglesea.

SWIFT.—A solitary Swift came in with the rush of migrants on May 2nd. On this day the Swallows and Martins hugged the shelter of the reeds, for the wind rose high after the lull on the 1st, but the more powerful bird flew boldly backwards and forwards high above the lake. Mr. L. Wilson Roberts reports a solitary bird on the same date at Barmouth. No more appeared at Rhos Neigr until the 7th, when I saw five at Llyn Penrhyn. These birds flew over the water for a short time only, and then moved off in a northerly direction. On the 8th and 12th I again saw single birds, and on the 11th Mr. K. J. P. Orton reports that the bird reached its usual haunts at Bangor in some numbers. By the 14th the Swift had reached its quarters inland, but towards the end of May several parties of birds appeared, played for a short time over Maelog, and then departed.

NIGHTJAR.—The Nightjar was churring in its customary haunt—a rocky outcrop near the lake—on the evening of May 18th. After this the bird, which abounds in Anglesea, became general, but I did not notice any movements of passing birds.

KINGFISHER.—Though we have seen the Kingfisher in Anglesea in September and October, we have not met with it in the spring. On May 3rd, however, when I was standing on the Holyhead Road bridge over the Cefni, a Kingfisher darted down the river, flying low along the surface and whistling, and disappeared in the distance. As the stream here is embanked and very straight I could see it for a great distance. Shortly afterwards a bird, probably the same, came up stream, flying in a similar manner, and disappeared round the bend in the direction of Llangefni. Last winter a pair of Kingfishers were noticed on the stream north of Beaumaris, where the Dipper nested in 1904, and apparently they remained and perhaps nested. They were seen several times this spring on this stream and one which flows into

it by the gamekeeper and one or two of the farmers. I visited the place in June, and found it to be quite suitable for the birds, though owing to the dry weather there was very little water in the brook. I saw nothing of the birds; but a boy whom I questioned about them, and who appeared to know them quite well, assured me that they had been about a short time before.

CUCKOO.—On April 29th a Cuckoo was calling; others came in on May 2nd, and by the end of the first week in May the bird was abundant everywhere.

LONG-EARED OWL.—The gamekeeper whom I have mentioned before described to me minutely a Long-eared Owl which he had seen in May this year close to his cottage near Beaumaris. The bird was being mobbed by a number of diurnal birds, and his attention was attracted to it by their cries. It flew from one to another of the trees in a clump of tall firs.

GANNET.—On May 28th Mr. Oldham, Mr. Cummings, and I saw two, or possibly three, Gannets off the coast to the south of Rhos Neigr. One was an adult bird with a pronounced yellow head, the other immature.

GARGANEY.—On one of the lakes on April 15th I watched for some time a fine male Garganey. When I was still at a distance from it I noticed the prominent white streak above the eye and back along the neck, which showed in strong contrast to the dark crown. From a distance the whole of the wings, except the flights, appeared to be bluish-grey. When I got nearer to it, behind the shelter of a friendly turf-bank, I could easily make out the elongated scapulars, the brown cheeks and breast, and the white wing-bars. It was feeding in company with some Wigeon, generally only dipping its bill and picking something from the surface, but once or twice it up-ended in the typical manner of other surface-feeding Ducks.

WIGEON.—There were at least thirty Wigeon on this water on April 15th, and I counted thirteen on the 22nd. Most of these birds were in pairs, the drakes constantly whistling as they swam round the ducks, and when swimming holding their necks very straight, an attitude suggestive of sexual excitement. On April 21st I saw a single duck Wigeon on the sea near Parc Point. A few days later all the Wigeon seem to have left.

(To be concluded.)

NOTES AND QUERIES.

MAMMALIA.

Disappearance of a local form of Squirrel. — Referring to the disappearance of my Squirrel, *Rotufa dealbata*, Blanf. (Journ. Bomb. Nat. Hist. Soc. xi. p. 299 (1897)), I may state the "Dangs," where I found it, is a small area (say six hundred or seven hundred square miles) at the foot of the Western Ghats between Surat and Khandesh. I have travelled all over this area several times, but only found this Squirrel in the northern end of it, and I doubt if the whole habitat was more than one hundred square miles. Blanford said he never saw it in the Rajpipla Hills, just north of the Tapti, and where I found it was about ten to fifteen miles south of that river. After Blanford's paper, I managed to secure four more young ones with great difficulty, three of which I brought home and gave to the "Zoo" about 1897-8. They are all dead, and never bred. Lately I heard that in the famine of 1900 the whole stock was killed and eaten by the jungle tribes, so the three skins in the South Kensington Museum are all that exists of this form.—R. C. WROUGHTON.

AVES.

The Red-backed Shrike (*Lanius collurio*) and its prey.—Having read with interest the note on this subject by Mr. Steele-Elliott (*ante*, p. 309), I am induced to ask if the species in question has been commoner than usual during the summer, as I have had an unusual number brought for identification; for, although a common summer visitor, it seems to be a stranger to many people. Amongst those I saw were a pair, in a very mutilated condition, brought by a bee-keeper in the neighbourhood. He informed me two pairs had nested within a hundred yards of each other, very near his hives, and the depredation they had caused amongst his bees was considerable, especially those from one nest where the young were hatched before he discovered their whereabouts; and if I may judge from the crops of the birds he brought his story was not exaggerated, for they were full of their stinging prey. He also said the attack was oftenest made when the bees returned laden from their journey. Of course it is well known

how often Humble-bees, &c., are impaled upon thorns near the nesting-place of this species, which I was not aware was in the habit of making such wholesale slaughter amongst the inhabitants of the hive. In speaking of the Hive Bee (*Apis mellifica*), it may be noted that many complaints have been made from several quarters during the past summer of the ravages caused by insect enemies; in some cases the whole contents of the hive having been destroyed by what I suppose were larvæ of one of the Wax Moths (*Galleria mellonella*), as I had several of the *white* cocoons—empty—of that species sent me as the cause of the depredations, although I believe one or two of those who sent them had very little idea that the moths they saw about the hives were the parents of the grubs that worked the destruction.—G. B. CORBIN (Ringwood).

Late Stay of Swift.—Whilst passing close by Bosham Station, near Chichester, on the morning of Sept. 26th, I saw a Swift flying in company with some Swallows and Martins. This instance, though so much earlier than the last I wrote to you about (Zool. 1898, p. 485), is perhaps worthy of note. The Swifts do not, as a rule, seem to linger like the Swallow tribe, but generally all disappear from this locality about the middle of August.—H. MARMADUKE LANGDALE (Compton House, Compton, Petersfield).

On Sept. 17th, at St. Andrews, I saw a Swift hawking over some houses, and I watched it for some time from our garden; next day it had disappeared, though I kept a good look-out. The day was warm and quiet. This is by far the latest date that I have any record of in that part of Scotland. On Sept. 18th, while playing golf on the New Course there, I noticed a pair of Wheatears, and they were still there on Sept. 23rd. I have not my notes by me, but I do not remember seeing this bird there so late in the year.—A. H. MEIKLEJOHN (1, Colville Houses, London, W.).

Notes from Hunstanton, Norfolk.—While spending a short holiday at Hunstanton, I devoted some little time to observing the Swifts, many of which breed in the crevices of the cliffs, and perhaps one or two pairs in houses also. Up to Sept. 12th inclusive, some Swifts were to be seen almost every day, and one could feel pretty sure of being able to find them at the south end of the town just before sunset. I have notes of "quite eight or ten Swifts" on the 10th, and of "several Swifts" on the 11th and 12th. Not one could be seen on the following day, which was cold and cheerless, and the wind, which had for some days been southerly, went round to the north-west. The

14th was a brilliant day, and at about 6 p.m. I watched a single Swift for some time through my field-glasses till it went up quite out of sight, possibly to start on its migration southward, as that was the last I saw of them. During the last few years the Swift has been the subject of several communications to this Journal, and in the volume for 1898 (pp. 436, 485) there are two records of single birds being seen in October; but the fact of several remaining till nearly mid-September seems worthy of record. Gilbert White, who at Selborne had such excellent opportunities of studying the life-history of the Swift, wrote in his twenty-first letter to Barrington, "They retire, as to the main body of them, about the tenth of August, and sometimes a few days sooner; and every straggler invariably withdraws by the twentieth"; and in a P.S. to his fifty-second letter to the same correspondent he mentions the fact of a single Swift being seen on Sept. 3rd, as if he regarded it as something quite extraordinary. On Sept. 12th a young female Black-tailed Godwit was shot on the Snettisham Marshes (which Mr. Clarke kindly showed me when he had just skinned it), and the shooter said there was another with it. On the 15th I saw an immense gathering of Gulls on the mussel-scalps opposite the Hunstanton lighthouse. There was a very low spring-tide, leaving bare a great extent of feeding-ground, which was literally white with Gulls. So far as I could judge, they were almost all Common Gulls in adult plumage, or nearly so. The day was a perfect one for making observations, with clear atmosphere and a cloudless sky, and from the cliff-top these Gulls presented as charming a picture of bird-life as one need wish to see. — JULIAN G. TUCK (Tostock Rectory, Bury St. Edmunds).

Bee-Eaters in Yorkshire. — About the middle of the month (September) a gentleman at Bentham, on the borders of Yorkshire and Lancashire, observed three curious birds round his bee-hives, and saw one of them take up a position near the entrance to a hive and swallow eight bees in quick succession. One of the birds was killed, and proved to be a fine adult male of the very rare Bee-Eater (*Merops apiaster*), which, on dissection, was found to have five working-bees in its stomach. This is, I believe, the fourth occurrence of this African species in Yorkshire, Spain being the nearest breeding-place of the species to our islands.—H. W. ROBINSON (Lansdowne House, Lancaster).

The Cuckoo and Twite.—In 'The Zoologist' for 1904, pp. 313-14, will be found a note of mine commenting on the alleged occurrence

of a young Cuckoo in a Twite's nest, recorded by Mr. W. Wilson. Mr. Wilson's note (*ibid.*, p. 264) had seemed to me highly suggestive of wrong identification; and I ventured to question the accuracy of his observations, and to ask for further information on some questions which seemed to me to arise from Mr. Wilson's notes on this subject. As an editorial note appended to mine expressed complete confidence in Mr. Wilson's accuracy, I did not venture at the time to say anything further. However, "magna est veritas, et praevalabit"; and it seems now that Mr. Wilson's Twite is *Anthus pratensis*! As Mr. Wilson has asked for further inquiry about the Twite and its distribution, I may add that this bird breeds in most parts of the British Islands where moors, mountains, and exposed heathy places are found, being by no means confined to the northern parts. As a breeding species, however, it is much less common on the eastern side of our islands than it is in Ireland and the West of Scotland. A well-known Scottish ornithologist to whom I was speaking about this bird some months ago informed me that it does not breed commonly, if at all, near Aberdeen, or in the lower parts of Aberdeenshire; so that it is at least doubtful whether the nest is to be found at all in Mr. Wilson's neighbourhood. In Ireland, in former years, I was quite familiar with the nest of the Twite; and my friend Mr. R. J. Ussher, to whose description of this bird, its nest and eggs, in Ussher and Warren's 'Birds of Ireland,' I beg to refer Mr. Wilson, probably has as good an acquaintance with the breeding habits of the Twite as any man living. The favourite haunts of this bird in Ireland are the rough heathy slopes and headlands cresting the great cliffs overlooking the ocean on the north, west, and south coasts; the more exposed and wind-swept, the better the Twite seems to like them. It also breeds on the inland mountains, but not on the low flat bogs of the central plain, as these, though heath-clad, are perhaps too wet for its liking. I have, however, found the nest on a small stretch of bog-land in co. Down, under the edge of a tuft of rushes in a dry spot where there was no heath, a place remote from any hill. This is, I think, exceptional, but I was informed this year that the nest has since been found in the same locality. The hills and moors of the North of England are a well-known breeding-place; indeed, this species was first made known to science, nearly two and a half centuries ago, from specimens obtained in the neighbourhood of Sheffield by Francis Jessop. In Ireland the Twite frequently lays six eggs, and Mr. Ussher mentions having obtained two clutches of seven, but there are seldom as few as four in a complete clutch. From what Mr. Parkin says (*ante*, p. 348), I gather that the same holds good in England. The nest is very generally on the

ground, often in a little recess or cavity, but sometimes it is raised above the ground in heath or low furze. Twite's eggs are smaller than those of the Common Linnet, and are easily distinguished from them by their more decided blue ground and darker red spots, which often assume the form of dashes or short crooked lines on the large end of the shell, almost approaching the Bunting type of markings. As to Mr. Wilson's question: Which is the most common bird which the Cuckoo depends on for the rearing of its young?—in the British Islands the Meadow Pipit is well known to be the commonest foster-parent. Indeed, on moors and uncultivated ground it is comparatively seldom that any other is selected. Of a Cuckoo's egg deposited in a Twite's nest I have never heard of an authentic instance, and I would be much obliged to any one who would inform me of one. The instance mentioned by Mr. Butterfield ('Zoologist,' 1904, p. 315) can hardly be regarded as substantiated. Certain of the Finches are, I know, occasionally chosen by the Cuckoo as the foster-parents of its young. I have myself known Cuckoo's eggs to be found in nests of the Chaffinch, Corn Bunting, Yellowhammer, and Reed Bunting. These birds, though largely seed-eaters, feed their young entirely upon insects and their larvæ, therefore they are quite capable of rearing a young Cuckoo. On the contrary, I have never known of a Cuckoo's egg in the nest of a Linnet, Redpoll, Goldfinch, Bullfinch, or Greenfinch. These feed their young on predigested seeds by disgorging (as also does the Twite), a method of feeding which would not be natural to a young Cuckoo. Cuckoo's eggs may have been found exceptionally in the nests of one or other of these species. I have not met with a case myself, but I know there are cases on record of Cuckoo's eggs having been found in such totally unsuitable nests as those even of the Wood Pigeon or Little Grebe (Seebohm's 'British Birds,' vol. ii. p. 383). But these instances may have been due to the fact that the parent Cuckoo was unable to find a suitable nest; or they may point to this strange habit of the Cuckoo being of recent evolution, and as yet imperfectly formed. And is there any proof that the young Cuckoo has ever been *actually reared* by such a strange foster-parent, or by any bird which feeds its young on vegetable matter? If any such case has come to the knowledge of any reader of 'The Zoologist,' it would be most interesting to have it recorded, to know the evidence and the details if they have been observed.—ALLAN ELLISON (Watton at Stone, Herts).

[Mr. Bidwell, in his "List of Birds that have occurred in Great Britain in whose nest the egg of the Cuckoo has been found" (Trans.

Norf. Nat. Soc. iii. p. 526 (1884), gives the Twite (*Linota flavirostris*), and for authority refers to 'Trans. Cumberland Association,' pt. ii. 1876-77, p. 172, a publication I have as yet been unable to consult. Mr. Bidwell also includes in his list the Linnet, Redpoll, Bullfinch, and Greenfinch, birds whose nests Mr. Ellison has never known to contain the egg of a Cuckoo, and are probably exceptional occurrences. ED.]

Sounds produced by the Eagle Owl.—It is difficult to put the notes of birds into words, and the sound syllabled "Kee-yak" by Mr. Harvie-Brown (*ante*, p. 313) does not convey my recollection of an Eagle Owl's hoot, but it may utter this note at times. Dresser expresses the ordinary cry of this species as "Hu Hu," which is better. My Eagle Owls, which are unfortunately no longer living, used to begin to hoot in January.—J. H. GURNEY (Keswick Hall, Norwich).

Early Arrival of Bernacle Geese (*Bernicla leucopsis*) on the Solway.—On Sept. 16th I saw a party consisting of about thirty birds on Newton Marsh. One of the local wildfowlers told me they arrived on the 15th; also a party of five Grey Geese, but he did not approach them so as to distinguish the species.—T. L. JOHNSTON (Carlisle).

Grey Geese near Carlisle.—On the afternoon of Sept. 16th a party of about thirty birds were observed on the outskirts of the town flying in a south-west direction. The observers were unable to identify the species, but they were probably Pink-footed Geese (*Anser brachyrhynchus*).—T. L. JOHNSTON (Carlisle).

Reappearance of the Quail (*Coturnix communis*).—While I was in Ireland in the middle of July, my brother informed me that Quail had appeared in considerable numbers in his neighbourhood, near Enniscorthy, co. Wexford, this season. They had, in fact, been widespread, and had been noticed by most of the country people about there. It was therefore with great interest that I heard the liquid triple call of this bird in my own neighbourhood here on July 30th, directly after my return home. I heard several of them calling together, first in a field of ripe wheat, and afterwards in a large field of barley, at some little distance from the first locality. As these birds have not been observed here for many years, and have been considered almost extinct for the past twenty-five years in Ireland, their reappearance this season in some numbers is worthy of being recorded.—ALLAN ELLISON (Watton at Stone, Herts).

Greenshank and Ruff in Cheshire.—On Aug. 27th a Greenshank and a Ruff were feeding on a wide expanse of mud at Bosley Reservoir, near Macclesfield. The association of the two large birds was not very close, for during a couple of hours I spent at the place each flew with a flock of Lapwings, and when I disturbed them, as I did several times, they sometimes flew together, and sometimes went diverse ways, but sooner or later they always returned to one part of the reservoir, where there was much shallow water, and apparently food in abundance. The Ruff uttered no note, but the Greenshank was very noisy whenever I put it up, calling with a loud, hard, disyllabic cry; in flight its tail-feathers were fanned out, and its white rump very conspicuous. When feeding it ran quickly in a series of short rushes through the shallow water, sometimes belly-deep, with its bill partly submerged and, I think, slightly open. Its quarry was the fry of some fish which leaped in a flashing shoal from the water in front of it, as though a Pike had rushed among them. These it hunted to some purpose, catching a fish at nearly every rush it made. The Ruff's mode of feeding was altogether different; whether on the mud or in the shallow water it walked deliberately, probing the mud with its bill. When at rest its pose was markedly erect compared with that of two Common Sandpipers which were standing near it. It was obviously a male, being not much smaller than the Greenshank, and appeared to be a bird in first plumage; its legs were lead colour, bill dark brown, feathers of the mantle brown with pale edges, crown rather darker than the forehead and hind neck; above and behind the eye was an obscure pale mark; the under parts were white, washed with pale warm buff on fore neck and sides of breast; rump and rectrices brown.—CHARLES OLDHAM (Knutsford).

Black Tern (*Hydrochelidon nigra*) in Cheshire.—On Aug. 19th Mr. T. A. Coward and I watched a Black Tern hawking up and down the mere at Great Budworth. It was a young bird, having brown feathers with pale margins on the mantle, and a broad black band on the carpus. A week later—on Aug. 26th—we saw another at the same place, apparently a bird in the plumage of the second autumn; no brown on the mantle, which was frosty grey, the black band on the carpus was smaller, and the legs pale reddish brown, not black as in the younger bird.—CHARLES OLDHAM (Knutsford).

The Black Tern (*Hydrochelidon nigra*) near Ringwood.—As a class the Terns are of somewhat irregular occurrence in this particular locality, none, as far as I know, nesting in the county; but in the autumn—and more rarely in the spring—several species, especially the

Common Tern and a few of the Arctic Terns, are sometimes seen in their aerial, poising flight over the river, and on rare occasions I have seen a stray Tern in summer—I may note a Lesser Tern in June, 1889; but in their autumnal migration most species visit us, the Black Tern certainly not being the most frequent. During August I had heard of Terns being seen upon various parts of the river, and that some were smaller than others; two of these latter were shot, and proved to be *nigra*, with the *white* forehead, collar, and under parts—the marks of immaturity. Both were very lean in body; the stomach of one was quite empty, the other contained a few insect remains, and one or two seed-like objects which it might have taken from the surface of the water. Most of the specimens I have seen were in the plumage as described above, but I have one in which the under parts are much suffused with dark grey, and the white collar is not so conspicuous—an older bird, I imagine; and I have yet another, killed in this neighbourhood some years ago—a veritable “Black Tern,” in the almost uniform dusky plumage of the adult. If I recollect rightly, several others were seen at the same time as this latter was shot, and it is certain this class of bird does not visit us so frequently as it used to do, arising, no doubt, from the changed condition of the river; a large lake-like sheet of water, being either densely overgrown with reeds or become dry land, with the main stream running through it in two or three divided channels to the bridges, while the volume of water passing through them must be considerably less than it was some years ago.—G. B. CORBIN (Ringwood).

Manx Shearwater in Worcestershire.—A Manx Shearwater (*Puffinus anglorum*) was shot by a working-man on a small piece of water near Bromsgrove, Worcestershire, on Sept. 16th, and was brought to me for identification by Mr. E. A. Stubbs, of Acocks Green, near Birmingham, in whose possession it remains. I am aware of but two other occurrences of this bird in the Birmingham district. Quatermain, of Stratford-on-Avon, told me some years ago that he had had one taken there, but what eventually became of it I do not know. On Sept. 5th, 1880, one was captured by a boy in Highgate Park, Birmingham. It was taken to a local birdstuffer, and from him passed into the collection of Mr. R. W. Chase, who has recorded it elsewhere. The various points at which these birds were obtained are all on the south side of Birmingham, and it seems probable that they were vagrants from the colonies of Pembrokeshire. They would conceivably follow the Bristol Channel and Severn, the Stratford bird striking the Avon at Tewkesbury and ascending to Stratford. The others would probably leave

the Severn somewhere near Worcester, and, flying north-east, reach Bromsgrove and Birmingham respectively.—THOMAS GROUND (Moseley, Birmingham).

Manx Shearwater (*Puffinus anglorum*) at Yarmouth.—On Sept. 28th I felt strongly tempted to take a stroll to the harbour mouth by the beach, for at this season of the year various “rock birds” leisurely work south, simultaneously with the inshoring of the Herring shoals; and, after a few days’ easterly winds, there is a probability of tired-out birds being washed ashore. I saw one wretched Red-throated Diver muddling about in the breakers, at which some boys were throwing stones. By a strong effort it dived and came up beyond the rougher water, and got away. An immature Guillemot and a very juvenile Razorbill only rewarded my two-mile inspection of the *débris* at the tide-mark, until nearing the breakwater, when I picked up a Shearwater. I had my nearly blind old chum Benjamin Dye, the naturalist-baker, with me, and, placing the bird (probably five days dead) in his hands, asked him to identify it. He did so promptly enough, and, as his fingers travelled across the head to the tip-end of the beak, exclaimed excitedly, “A Manx Shearwater, by Jove!” He had guessed correctly, whereon I told him to keep it, as an addition to his small collection of rare Yarmouth birds.—ARTHUR H. PATTERSON (Ibis House, Great Yarmouth).

Summer Migrants in South-western Hants.—In this corner of Hampshire our summer visiting birds have been rather uncertain in appearance, perhaps the most noticeable being the apparent scarcity of the Swallow; few have been seen this season, where some years ago hundreds were observed, and preparatory to their autumnal journey countless numbers formerly congregated, in the morning sunshine, upon the glass roof of the Corn Exchange, as if for discussion and arrangement; but up to the middle of August I did not see a dozen at the old rendezvous, and greatly regretted the loss of their much-loved busy twitter soon after dawn. Since that date the numbers were augmented by arrivals from farther north, but few compared with former years. In the early summer a pair came to the old nest in a chimney of the house, and, as in previous years, I noticed how early the song was begun—at the very break of day; and even while it was yet dark twitterings were occasionally uttered, as if eager to begin the happy summer notes. The House-Martin and Sand-Martin were in about usual numbers in their respective localities; in fact, the former species has again become commoner than it was some few years ago. Of this class the Swift was decidedly the most abundant, at times

being the only species to be seen on the wing. It came early—I saw the first April 26th—and it stayed later than usual—I saw three Aug. 16th, and one Aug. 19th—rather a late date, as far as my experience goes. The Nightingale, judging from the frequency of its song from mid-April onwards, was far from rare; but some of its congeners, as the Blackcap, Reed-Warbler, Lesser Whitethroat, Grasshopper-Warbler, &c., cannot be named in the same catalogue; whilst the scolding “chiddy, chit, chit” of the Sedge-Warbler—so suggestive of warm days and pleasant summer evening rambles—was more infrequent than the Nightingale’s song. The Cuckoo, Wryneck, and Nightjar were seen and heard in fair numbers. For the past two or three years the Land-Rail has most certainly decreased, but not to be compared with the decrease of the beautiful little Yellow Wagtail (*Motacilla raii*), which seem to have almost deserted us. A few years ago it nested freely in the meadows where the marsh-marigold spread its yellow mantle, and the elegant dancing flight of the bird as it rose, with its short but merry note, from feeding close to the browsing cattle, was one of the most pleasant sights and sounds to the eye and ear of any one who was not entirely dead to the beauties of nature. It was not so last summer. A few years ago the birds were so common that the fish-poachers knew the exact whereabouts of the old river-keeper, up or down stream, by watching the movements of the “Yellow Mollies,” as they are locally called. In a day spent upon various parts of the river I saw but one bird, where in previous summers I have seen scores in a three-miles row, and a friend of mine, who many times searched narrowly for the nest (in anticipation of finding eggs as commonly as formerly), was quite unsuccessful, and did not see a bird. I hope, however, another season the record will be brighter. As if in part compensation for the loss of this elegant little species, it may be remarked that a number of Redshanks have in recent years nested in the meadows by the river, and their unmistakable note and presence have become comparatively familiar to those who a few years ago were ignorant of the existence of such a bird. Some eggs taken, sold, and eaten as those of the Lapwing undoubtedly belonged to the Redshank, as I was shown several to which these remarks apply. I did not hear of either Harriers or Honey-Buzzard, except that a “large brown Hawk” (possibly a Common Buzzard) frequented a wood and heathy piece of land for some time about the end of May, but it escaped both trap and gun, as far as I could learn. Several Hobbies were seen, but not as nesting birds. I saw one about the middle of June, and another later in the season. A few evenings ago I saw a

large bird following the few Swallows as they hurriedly flew towards their autumn roosting-place in the reeds by the river, and, if I mistake not, it was a Hobby, but the quick movements of the bird in the increasing dusk prevented a certainty of identification; such a habit would not be at variance with what I have before recorded of this handsome little Falcon.—G. B. CORBIN (Ringwood).

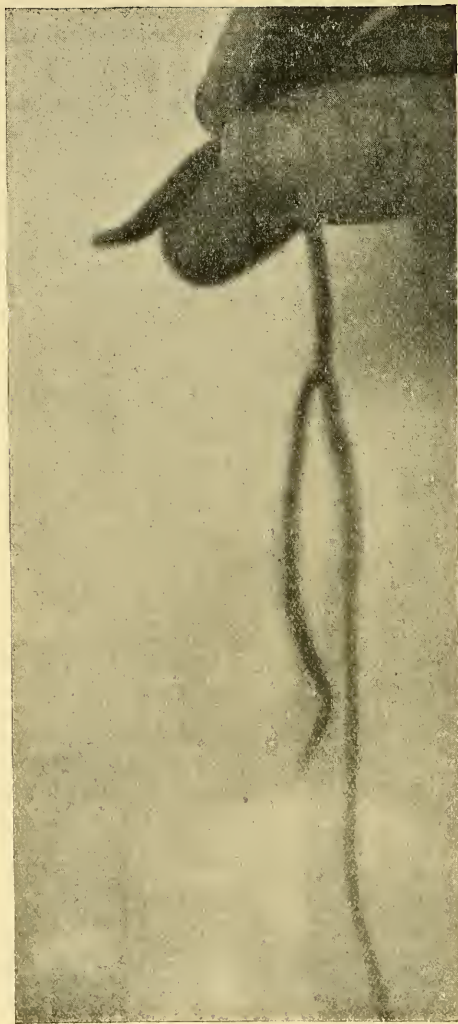
“Birds Nesting in Andalusia.”—My friend the Rev. F. C. R. Jourdain, who was with us for a part of the time in Andalusia, wishes me to make the following Corrigenda et Addenda to the list of species seen in 1905, published in the last number of ‘The Zoologist’ (*ante*, pp. 326-28):—

Corr.—Melodious Warbler; dele reference to eggs.

Add.—Western Olivaceous Warbler (*H. opaca*); eggs, May 11th. Blackcap; eggs, May 10th. Cetti's Warbler; eggs, May 12th. Roller. Little Owl. Montagu's Harrier. Stone Curlew. Avocet. Dunlin. Oystercatcher. Grey Plover; April 20th. Lesser Tern. *L. melanocephalus* (?).

The Addenda were met with before joining us and after leaving us.
REG. B. LODGE.

A Query. — Despite the constant attention which observers like Mr. Oldham are bestowing on the habits of the Noctule, there still remain several doubtful points in its life-history. We know, for instance, that the sexes fly together, but how do they assort themselves during sleep or hybernation? Was the late J. H. Gurney right in suggesting that the colonies are often composed of a single sex? Again, what is the colour of the newly-fledged young? Are they of the same tints as the adults, or are they darker? Any information, however slight, which any reader of ‘The Zoologist’ may be able to publish on these questions would certainly contribute towards a more complete knowledge of the natural history of this fine Bat.—G. E. H. BARRETT-HAMILTON.



VERMES.

Malformed Earthworm.—I had brought me (Sept. 4th), from the village of Upton, near Yarmouth, a most remarkable Lobworm, from the middle of which branched two separate tails. From the tip of the head to that of the longest tail is about six inches, to that of the other about five and a half. Amongst the many myriads of worms I have seen, I never saw a malformation of this kind; the only other instance of which I have heard is one figured in the 'Strand Magazine' of September, 1900, which was discovered at Norwood.—ARTHUR H. PATTERSON (Ibis House, Great Yarmouth).

NOTICES OF NEW BOOKS.

The Origin and Influence of the Thoroughbred Horse. By WILLIAM RIDGEWAY, M.A., F.B.A., &c. Cambridge: at the University Press.

A BOOK on this subject was distinctly wanted, and these pages constitute a volume which will be regarded for a long time to come as one of considerable referential value. Most Englishmen are supposed to know something about a Horse, though few do so even in a general way, as may be well understood by studying that immense gang of nondescript gamblers who infest every racecourse, and degrade a great and useful sport; these individuals, as a rule, are ignorant of even the points of a thoroughbred Horse. Many real horsemen, on the other hand, are equally without an adequate conception of the origin of the animal they love so well; and there are naturalists who perhaps know least of the species which may almost be said to have created some of our national instincts. At all events, it is generally held that the Arab Horse was the ultimate source of our thoroughbred and half-bred Horses, a view which Professor Ridgeway holds has "no historical foundation, that the Arabs had only got their fine breed of Horses from North Africa at a period later than the Christian era; and that, on the other hand, there was the clearest evidence of the existence in Libya of a fine breed of Horses for a thousand years before the Arabs ever bred a Horse." That the Libyan Horse is the stock from which all the best Horses of the world have sprung is the text of this book, and in support of the thesis a vast material of information relating to both prehistoric and historic times has been compiled and arranged.

Among the many commentators on the Book of Job, Professor Ridgeway apparently strikes a new suggestion that the writer of that poem, with all his wealth of imagery concerning the war-Horse, did not know the Horse in his own land—supposing that to be Arabia Petraea—but derived his knowledge of

the animal from the contiguous regions of Palestine and Babylonia. He recalls the biblical description of the possessions of Job as consisting of Sheep, Camels, and Oxen, his only equine possessions being five hundred she-Asses, not a single Horse being mentioned; nor does he believe that the Sabæans, who are described as destroying the flocks and herds of the patient sheikh, were any better provided with Horses than they were in the days of Strabo. A similar comment is made on the animal possessions of Terah, Abraham, Lot, and Laban, in the enumerations of which no mention of the Horse occurs; and Prof. Ridgeway quotes with approval the opinion of Hilprecht, that "the Horse appears in Babylonia first shortly before the middle of the second millennium." Mr. Lydekker's theory of the Indian origin of the Arab Horse is considered sufficiently disproved by the fact that, "as the Horses of Libya were proverbial for their gentleness before the Christian era, so, on the contrary, the Horses of North-western India are specially mentioned by Ælian on account of their violent tempers and the difficulty of riding them, which necessitated the use not merely of bits but of muzzles to control them."

Of the colour of the thoroughbred Horse, it has already been pointed out by Major-General Tweedie that the tendency of the highest breeding in latitudes far separated is to wipe out all colours save bay and chestnut. Prof. Ridgeway gives statistics derived from the colours of the first three Horses in the Derby, Oaks, and St. Leger for the three decades from 1870 to 1899, as proving that not merely has grey disappeared altogether, and that black is almost gone, but that chestnut is also disappearing as well as brown, while the English racing stock is steadily becoming bay.

This book can be neglected neither by the naturalist, horse-breeder, nor sportsman, while there is sufficient archæological and classical discussion to engage the attention of scholarly readers.

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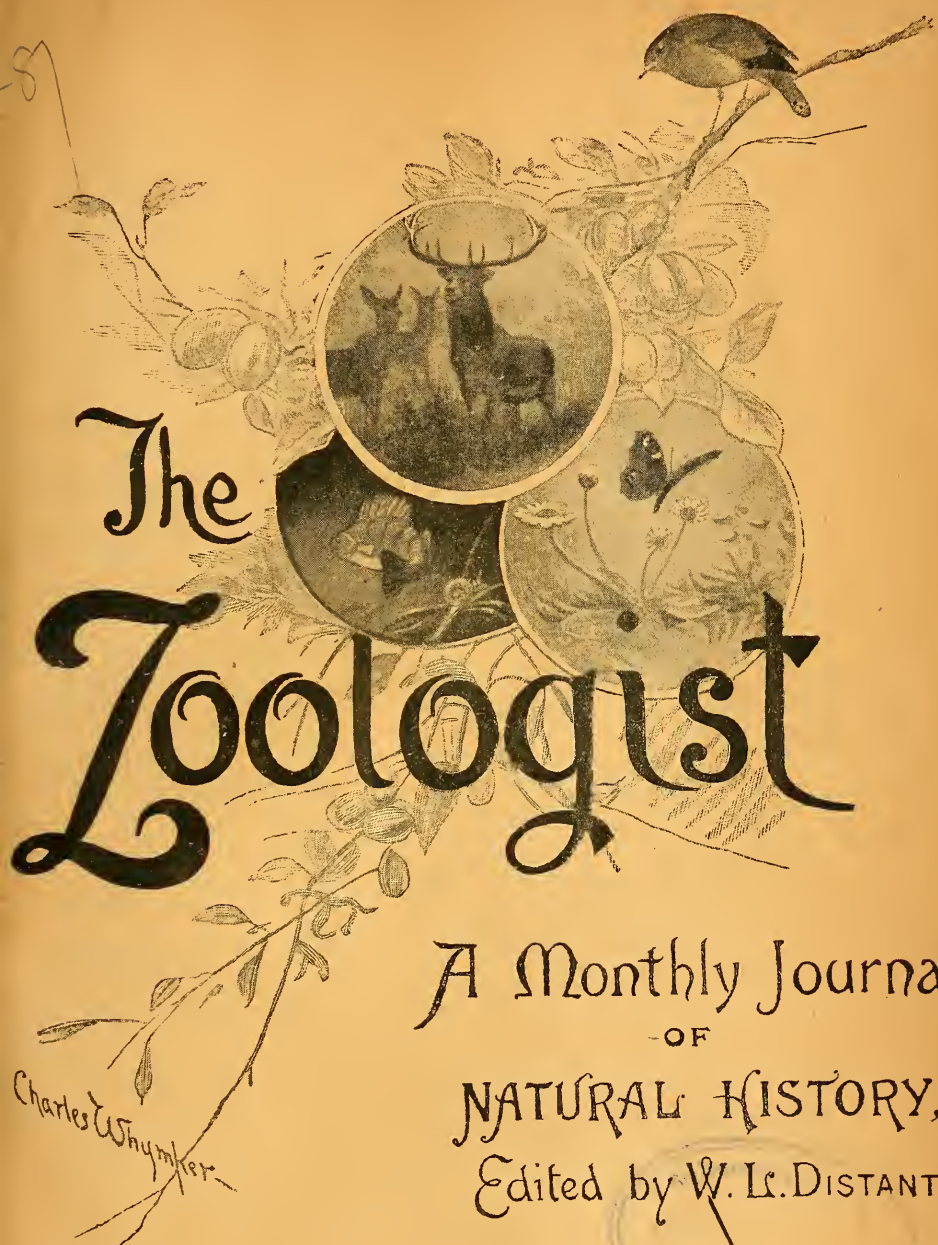
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THE ZOOLOGIST

No. 773.—November, 1905.

FLYING FISH IN MEDWAY AND SWALE (KENT).

BY JAMES MURIE, M.D., LL.D., F.L.S.

(Memb. Kent and Essex Sea Fisheries Committee.)

KENT CAPTURES.—In the 'Report on Thames Estuary Sea Fisheries,'* pt. i. p. 125, mention is made of a Flying Fish (*Exocoëtus volitans?*) as follows:—"We have here to add to our district's fish fauna a rare traveller from the Atlantic. This unique example got up the Medway as far as Rochester at the end of September, 1898. A person, noticing a fish leap from the water and skim along the surface, struck out with his walking-stick, and secured it. It proved to be a Flying Fish, measuring fifteen inches in length."

The above specimen was not seen by me, but from informant's description there is strong presumption of its similitude with a second example more recently obtained in a by-water connected with the mouth of the Medway.

This latter specimen was caught on Sept. 2nd, 1905, by two Leigh-on-Sea fishermen (Mr. Wesley Bundock and his mate), who were whitebaiting over in Kent waters, not under the jurisdiction of the estuarine authorities.† The men were using the

* Issued (1904) by the Kent and Essex Sea Fisheries Committee.

† We may observe *en passant* that the Kent and Essex Sea Fisheries bye-laws forbid whitebaiting during the months of August, September, and October. But this fishery notwithstanding is allowed by the Queenborough
Zool. 4th ser. vol. IX., November, 1905.

seine- or drag-net not far from Queenborough, *viz.*, at the southern corner of the West Swale, somewhere between the outlet of Milton Creek and Elmley Ferry (see diagram, fig. 1). It was early morn, about daylight, shortly after high-water, when, on hauling in the drag-net, they were surprised at the unusual spluttering therein. This they found to be from the presence of a long Pike- or Herring-like fish, very unlike anything met with in their usual catch in the Thames Estuary. The great length of the pectoral fins was a feature which at once arrested the attention of the fishermen.

In due course the fish was brought to me for identification, and off-hand I recognized it as bearing close resemblance to the Greater Flying Fish of Couch (his *Exocætus volitans*); as likewise similar to Yarrell's and Day's figures of the same species (compare remarks under next subheading—What species?).

In so far as we are aware, the two fishes in question are the only authentic evidence of the presence of species of Flying Fish (*Exocætus*) on the Kent shores. Howsoever, in an interview with Mr. Bundock, captor of No. 2, about a fortnight afterwards, he mentioned with glee that a day or two previously he had seen another Flying Fish (?) towards sunset near the place where the former one had been secured. Cross-questioned as to possibility of its being a Mullet, he affirmed that he was pretty positive it was a Flying Fish! But he only based his opinion on the manner in which it escaped from the net, not leaping over the meshes in Mullet fashion; so one hesitates to accept this as proof positive.*

Incidentally I may mention that I have been asked—did I think No. 2 made its way through mouth of the Medway, thence

Corporation, and pursued within their restricted area during the said three months' close-time of their neighbours. Again, the Thames Conservators entirely prohibit whitebaiting at all seasons in any form within the limits of their jurisdiction. The Rochester authorities of the River Medway pursue a nearly similar course to the last. The boundary lines of those several bodies' districts so abut as to be merely nominal, and unfortunately not always strictly respected by the fishermen. Such are some of the vexatious troubles and anomalies of fisheries' regulations.

* The same may be said of a rumour from a correspondent of leaping (flying?) fish seen near Margate in early September, which subsequent inquiries did not verify.

narrow Queenborough entrance leading into the West Swale, or otherwise? My reply is, more chance of its entry by the Whitstable end of the East Swale by following up the whitebait at the first of the flood (see arrow in diagram).

A mere notice of the Kent locality of the Flying Fish might have sufficed for a record, but on the examination of the second straggler there has arisen [queries. These, though of a minor kind in themselves, yet seem to me to lead to matters of a wider significance, and I therefore venture to treat of them accordingly.

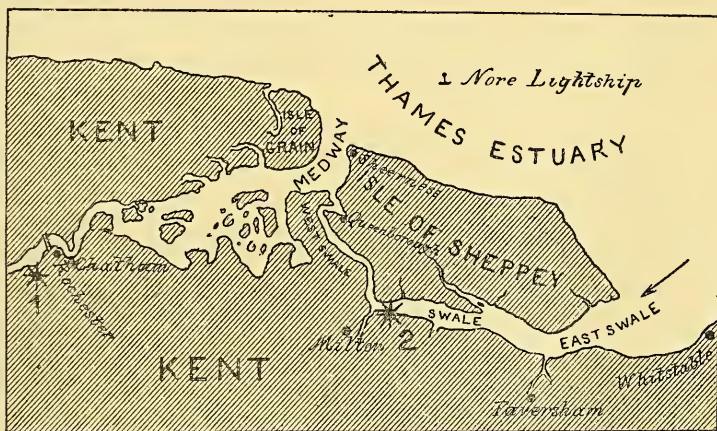


FIG. 1.—Rough chart of Medway and Swale neighbourhoods. *1 and *2 indicate approximately where the two Flying Fish were taken.

WHAT SPECIES?—Although we mention above its apparent outward resemblance to the so-called Greater Flying Fish of English writers, viz., *Exocoetus volitans*, Linn., yet a more critical examination and comparison with specimens in the British Museum collection has rather led to the inference of its correspondence with the Streaked Flying Fish, *E. lineatus*, Cuv. and Val. Such has been the determination arrived at by Messrs. Boulenger, Regan, and myself.

Hitherto two kinds of Exocoetal Flying Fish have been allowed generally by British authorities as occasional visitants to our shores. One with *short ventrals* and other characteristics—*E. evolans*, type; others (got more numerous) with *long ventrals*,

&c.—so-called Greater Flying Fish, *E. volitans*, or kindred. But there may rest uncertainty whether all the latter have been fish that would rigidly come under the specific denomination of *E. volitans*? According to our interpretation a third British kind may be added—the Streaked Flying Fish, *E. lineatus*—that is to say, if this and all the previous identifications are substantial.

This seems rather an open kind of verdict, but under the circumstances unavoidable; for when what is supposed to constitute positive specific distinction is put to the test, sharpness of definition gives way. When such authorities on the group as Gunther,* Lutken,† Jordan, and Evermann‡ are not in concord with regard to the above and other species, the matter may be regarded as still *sub judice*.§

This Kent specimen was a female, about fifteen inches in extreme length (tail-tips faulty), and in weight turned the scale slightly over eight ounces. Colour herring-like. The dorsum blackish, or rather of an intense bluey grey, this shading to a lighter tint or pale blue of iridescent character towards the lateral line. Head dark above, but the sides and lower parts of gill-covers right back to root of pectoral fin, as also abdomen, of a silvery white. The general expanse of the large, wing-like pectoral, when spread out, greyish, with post-inferior margin darker. But the outer prominent surface of the rays, markedly their basal ends, are silvery; so that when they are approximated, fin closed on body, there appears a lengthened patch of iridescent sheen passing from the shoulder across the fin, parallel to its long axis. The caudal forks, the dorsal, the anal, and the ventral fin pale or greyish; the ventral, however, most conspicuous on its inside superficies, having the middle rays of darker tint less appreciable on the external surface when the fin is expanded. Irregular traces of a series of minute pigmentary

* 'Cat. Fishes in Brit. Mus.' vol. vi. (1866).

† "Vidensk med. Naturh. Foren" (1876), and "Contr. diagn. Poiss. Volan." Journ. Zool. tome vi. (1877).

‡ "Fishes of North America," Bull. U.S. Nat. Mus. pt. i. (1896).

§ Smitt, in his 'Scandinavian Fishes,' i. p. 58, makes an important observation, and arrives at the conclusion that *E. lineatus* is identical with Linnæus's *E. volitans*, and even hints that *E. bahiensis* may be included with them as one species.

spotting along each oblique series of scales, most clearly distinguishable where epidermis intact.

The elongate shape of body—a mixture of Pike or Garfish type—contrasts with the Pilchard form of the head. The top of the latter or interorbital space is depressed or slightly concave. The big eyes themselves are only moderately prominent though staring; the pupil large, deep blue, approaching black, the irides lustrous. The opening of post-nostril, which is covered by a flap, is a trifle nearer eye than snout; the latter is obtuse and shorter than the more pouting inferior maxillæ. No barbel present, but instead a fringe of very short, slender papillæ is evident, by hand-lens, on the projecting under lip. Teeth in both jaws very diminutive.

Fin formula:—D. 12, P. 16, V. 6, A. 9, C. $1\frac{3}{8}$?

Mr. Regan and myself had doubts respecting enumeration of the scales on the lateral line, some of which had got rubbed out of place.* There seemed about fifty-eight?, and some thirty-eight or so between the occiput and the dorsal fin. Between the origin of the latter and the lateral line to all appearance were eight? rows of scales.

Measurements:—Length from the tip of the jaw to the root of the tail (*i.e.*, to last caudal vertebra)=12 in. The lobes of the tail were both defective at their extremities. The upper supposed to be 2 in. and the lower one 3 in. long when intact. This would give approximately an extreme length to the fish of 15 in., as already suggested. Depth of the body $1\frac{1}{2}$ in., and its girth behind the pectorals equivalent to, say, $4\frac{3}{4}$ in. Length of head $2\frac{5}{12}$ (or $2\frac{1}{2}$) in.; the diameter of the eye about $\frac{1}{12}$ ths of an inch.

As to the fins generally, their relative positions, &c.:—The length of pectoral 8 in., and extending even beyond the last anal ray, nearly to the rudimentary rays of the caudal. When expanded as in the act of flying, from tip to tip, barely 15 in. [Mark, these do not descend to horizontal level.] The first ray simple, the second divided, and third and fourth longest. The dorsal fin situated well behind, its base 2 in. long (the rays

* Regarding authors' discrepancies of numbers of scales in fish, Dr. Day's remarks thereon (P.Z.S. 1879, pp. 759-60) in the case of the Pilchard may here be appropriate.

injured). Ventral fins inserted about midway between the pupil and the last caudal vertebræ. The first ray of the anal nearly vertical with middle of dorsal, and its base $1\frac{1}{10}$ in. long.

ITS FOOD.—Concerning the nature of its food, the stomach and intestine contained only remnants of a semi-digested, light buff-coloured, pulpy substance. This, under the microscope, gave *no* indications of minute crustacean or molluscan structures, all being reduced to a state of granular consistence. But on opening the mouth the presence of a fish's tail revealed a small whitebait (a couple of inches or so long), which had got stuck in the throat, and reaching to as far as the œsophageal entrance of the stomach. It broke to pieces on the endeavour to extract it, so I cannot say with certainty whether young of Herring or Sprat.

The ordinary and prevalent diet of the Flying Fishes has been far less studied than their aerial movements. Professor Mobius* opened one (*E. brachysoma*, Bleeker) about 8 inches (=20 centimetres) long, which flopped right on to him aboard ship, at sunset, in the neighbourhood of Seychelles, Indian Ocean. Its alimentary tract contained pulpy matter, among which were diminutive crustaceans. (Couch, 'Brit. Fishes,' vol. iv.) surmises that minute Crustacea and Mollusca form their aliment. Jordan and Evermann† only ambiguously say of the group—"carnivorous and herbivorous," but give no data. Judging from the Swale example, fish may at times form a considerable proportion of their food, and even lead to seasonal migrations (see remarks further on). In support of their being consumers of fish, we may quote F. D. Bennet,‡ who says:—"Their flesh is the *bonne bouche* of travellers;§ it bears some resemblance to that

* "Die Bewegungen der fliegenden Fische durch die Luft," Zeitsch. für Wissensch. Zool., Bd. xxx. Suppl. p. 344.

† 'Bull. U.S. National Museum,' pt. i. p. 727 (1896).

‡ 'Narrative of a Whaling Voyage round the Globe from the Years 1833 to 1836,' vol. ii. p. 286.

§ Brown-Goode observes: "They are considered excellent food" ('Fishery Industries of United States,' pt. i. p. 459); Dr. Gunther, speaking of *E. callopterus*, adds: "They are excellent eating" ('Introd. Study of Fishes,' p. 622); Messrs. Jordan and Evermann declare that the Sharp-nosed Flying Fish (*E. acutus*) and the California Flying Fish (*E. californicus*) are both "good food-fish," and the latter "sometimes taken by thousands off Santa

of the Herring. . . . Although the Flying Fish excites so much commiseration for its persecuted state, it is itself predaceous, feeding chiefly on smaller fishes." Again, Smith's sea-angling experiences in his voyage to Callao point to the same thing, where an artificial gilt minnow proved irresistible as a bait.*

THE OVARIES.—As to sexual condition, each ovarian tube was about four inches long, flaccid, but considerably contracted, like that of a spent fish, as it proved to be. Although the great bulk of the eggs had been extruded, there still remained a few unripe ova, slightly varying in phase of development. Size of the larger ones from a sixth to a third of a millimetre. Their shape generally is globular, though some with tendency to spheroidal outline. But the most notable feature consists in the presence of an envelope or covering of a minute filamentary kind, disposed somewhat spirally, the overlapping and inter-crossings giving a partial reticular character. The fibrillar arrangement may, in fact, be compared to a ball of twine, the latter wound round in somewhat irregular though concentric fashion. Our specimens, as examined under the microscope, in a watery medium, seemed to imbibe the fluid and swell out the fibres; some of the terminal ends of these untwisting floated free (see fig. 2, larger ova).

Haeckel,† when a pupil of Johannes Müller, some fifty years ago, published an interesting paper fully illustrated, containing his observations on the fibrillated ovarian eggs of members of the Gar-Fish family, besides the Flying Fish, which contribution Kolliker‡ duly commented on; this latter, however, was chiefly their histological aspect. To Frank Buckland§ a certain credit is due in pointing out how that at Herne Bay weir the "Gore-bill's" eggs adhered to the sticks and stones by their grasping

Barbara." An opposite opinion is given by Gervase Mathew, who says that those the Hawaiians (= Sandwich Islanders) catch, averaging 1½ lb. in weight, "are rather dry and tasteless, but acceptable to any one who has been without fish for a length of time" (see 'Zoologist,' 1873, p. 3740); Day ('British Fishes,' ii.) alludes to them "As food—Inferior."

* 'The Zoologist,' 1875, p. 4413.

† "Eier der Scomberesoces," in Müller's Archiv, 1855, pp. 23-31, Taf. iv-v.

‡ In 'Wurzburg Verhandl. Phys. med. Ges.' viii. (1858).

§ 'Rep. Sea Fisheries,' 1879, Append. ii.

vibratile cilia. But Ryder* shortly afterwards still more strongly emphasized the function of the thread-bearing eggs by practical researches on those of the Silver Gar (*Tylosurus longirostris*) and the Atherine, Silver-Sides (*Menidia notata*), &c., drawing attention to its importance from a sea-fisheries standpoint. He regrets having had no opportunity to study the eggs of the Flying Fish, nor have others, so far as I am aware, essayed to corroborate Haeckel's exposition of the Exocœtal egg type, though Gar-Fish eggs have repeatedly been examined.† Millet‡ had early shown fish-eggs attached to a barrel-loop floating near Cape Verde Islands, and Rattray subsequently, when sounding in Gulf of Guinea, found pelagic ova fixed in mass on a tow-net line. Cunningham described and figured these,§ and they pretty well substantiate some of Ryder's conclusions.

Without desire further to weary by detail or reference to side-issues, enough has been said to justify possibility of the Flying Fish's breeding station in mid-ocean. At least, any one who has slowly traversed the Sargasso Sea in a sailing craft can easily understand those waters as most suitable quarters for the breeding and rearing of Exocœti. But again we are confronted by Howard Saunders's|| statement of their swarming into the rock-crevices for spawning purposes at the Chincha Islands. Even this can be explained by presence of seaweeds and tangle in the vicinity. According to Saunders. at the above quarters they breed at the end of March. Risso¶ gives beginning or mid-summer as when full of eggs in the Mediterranean. The Swale specimen may by degrees or in batches have shed its spawn in deep water, say, early in August, prior to its fatal food-forage visit to Kent waters. All the preceding haphazard guesses go to show how much is yet open for interesting observation and needful investigation, equally by the sportsman, the sea-traveller, and the naturalist.

* 'Bull. U.S. Fish. Commis.' i. (1881), p. 283, pl. 19; and vol. iii. (1883), p. 195, and woodcuts.

† Suffice to mention Day, McIntosh, Masterman, Smitt, &c.

‡ In material found by Capt. Freemont, Compt. Rend. 1865, p. 342.

§ From Rattray's 'Buccaneer' Expedition, see Trans. Roy. Soc. Edinb. xxxiii. p. 108, pl. 7, fig. 7.

|| 'The Zoologist,' 1874, p. 3838.

¶ 'Ichthyologie de Nice' (1810), and 'Hist. Nat. . . l'Europe Méridionale,' 1826, tom. iii. p. 446.

FIG. 2.

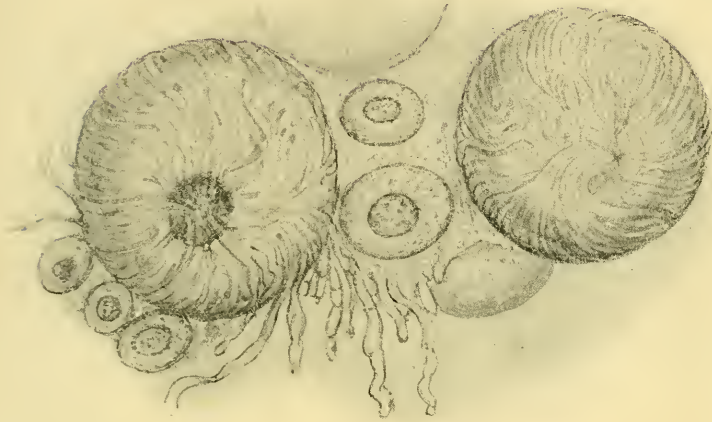


FIG. 2.—Some of the ovarian eggs, in different stages of development, with their adherent intervening mucous membrane, from the Swale Flying Fish (*Exocoetus lineatus*), as sketched under the microscope. While confirming Haeckel's observations on the fibrillar nature of the egg-envelope of *Exocoetus*, the specimen moreover shows the filaments' tendency to stream out. Compare fig. 4 below, and consult Ryder's descriptions and illustrations as quoted.

FIG. 3.

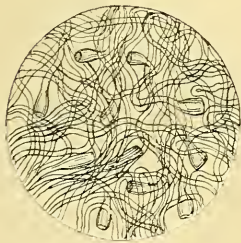


FIG. 4.

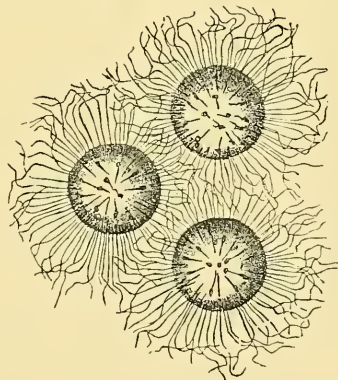


FIG. 3.—Unripe egg of the Saury Pike or Skipper (*Scombrox saurus*); showing the net-like envelope of fibres or filaments surrounding it, among which are seen a few of their swollen bases of attachment (after Haeckel).

FIG. 4.—Ripe eggs of the Gar-Fish (*Belone vulgaris*), with their wavy free filaments intertwined (after McIntosh and Masterman).

THEIR MIGRATIONS.—Flying Fishes of the *Exocætus* type are acknowledged oceanic habitants of gregarious nature, usually met with by seafarers in considerable—nay, even vast—shoals. Some of the Atlantic species, though more numerous within the warmer latitudes, are yet distributed widely. They frequent the African seaboard, the neighbourhoods of Cape Verde Islands, Canaries, Azores, &c., enter the Mediterranean, and occasionally run up the Adriatic for a short distance. Smaller bands, or perhaps mere roving detachments, appear at irregular intervals along the Western Lusitanian and French coasts. Great Britain and Ireland come in for their advent more sparsely, particularly around the entrances to the English, the Bristol, and St. George's Channels. Even stragglers once upon a time hie north as far as Norway.* Dr. Day† casts doubts as to shoals approaching our shores, though admitting their gregarious habits. But surely R. Q. Couch's personal observations‡ may be trusted! Even if it holds good that but a third of British records are based on capture of single specimens (*vide infra*), it does not necessarily follow that these have had no companions whatsoever in the vicinity—*e. g.*, Couch's lot pursued by Bonitos. If Day meant *immense* shoals the qualification might be allowed.

Subjoined we have drawn out in tabular form the chief data upon which Flying Fish have been reckoned among the British marine fauna:—

1765	June.	Carmarthen.	Up River Towy. ¹
1796	Sept.	Cumberland.	Solway Firth; Allonby.
1823	July.	Somerset.	Up River Parrett, near Bridgewater.
1825	Aug.	Dorset.	Off Portland Island (shoal).
1827?	—	Cornwall.	Up Helford River, near Falmouth.
1830–38?	Summer.	Cork, Waterford.	Off shore (shoals).
1840	„	Devon.	Plymouth Quay.
1845	„	Cornwall.	Mount's Bay (shoal).
1849	Oct.	Devon.	Plymouth; Stonehouse Pool.
1860?	—	Somerset.	Bristol Channel; Weston-super-
1876	Aug.	Somerset.	Bristol Channel (shoal). [Mare. ²
1891?	—	Glamorgan.	Bristol Channel; Cardiff. ³
1898	Sept.	Kent.	Up River Medway, near Rochester.
1905	Sept.	Kent.	Swale, inside Isle of Sheppey. ⁴

^{1, 2, 3} supposed to be *E. evolans*; ⁴, *E. lineatus*; and all the others *E. volitans*.

* Collett (R.). 'Norvège, Carte Zool.-Géograph. Liste Animaux Verteb. de Norvège,' 1875. Refers to specimen taken in Christiania Fjord, 1848.

† 'Fishes of Great Britain and Ireland,' vol. ii. p. 155, footnote.

‡ 'Zoologist,' 1847, p. 1614.

The above demonstrates—*a*, wide intervals of yearly dates; *b*, midsummer and more frequently autumn their visitation period; *c*, neighbourhood of S.W. counties of England and S.E. of Ireland forming a central rendezvous; *d*, shoals seen in a third of the cases; *e*, individuals run into shallow waters, even up rivers.

As to the wide gaps in dates, this perhaps means little else than paucity of registered observation. Seeing that there is a tolerably regular annual migration of them in great schools to and from the Mediterranean, and if more sparsely even northerly along the Atlantic seaboard, presumably their presence in South British waters is more frequent than records show. Be that as it may, we have analogous phenomena of great hordes and more scattered troops of several species of Flying Fish sojourning on both sides of the American continents, and migrating like those frequenting the Atlanto-European seaboard.

Taking the matter in a broad sense, from what has been said, it is pretty evident that the bulk of the adult Flying Fishes make annual summer and partly autumnal migrations from their ordinary mid-ocean centres. For what purpose, then, these wanderings? Is it search for food, effects of seasonal changes, or stimulus for breeding purposes? Their spawning-grounds are still doubtful, while again there are records of presence of their fry in shoals a thousand miles from land.* These reflections open a wide field for speculation, and emphasize the fact that there is yet a great deal to be learned respecting their economical relations. Hitherto their mode of flight seems mostly to have captivated voyagers and naturalists generally.

That the adults are fish-feeders may be taken for granted. Is it possible, then, that subsequent to their breeding season adults in squadrons start off on their travel after food. Sardines, otherwise Pilchards, swarm in congregations, and are fished for around the Canaries. They flock into the Mediterranean, other sections traverse the Atlantic border, and, as is well known, are abundant on the French maritime and S.W. neighbourhoods of the English Channel. Can this account for the presence of the Flying Fishes who follow the young Clupeoids, and their restriction (within limits) to the British area where observed during mid-

* See Gervase F. Mathew in 'Zoologist,' 1873, p. 3739.

summer or autumn in companies, or otherwise? Stragglers, of course, there will be, either driven from their companions by enemies, or otherwise accidentally separated. But why do they occasionally ascend river-mouths to limits of the brackish water? The Kent specimen, one would suspect, entered the Swale following a shoal of whitebait, and it is not unlikely that others have gone up rivers under similar conditions.

Taking into consideration what paucity of information is available to judge of where the *Exocæti* breed and spawn, it behoves not to speak rashly. The uncoiling and grasping structure of their egg-covering is equally adapted to entwine the weedy vegetation of shallows, as it is capable of pelagic floating and attachment to objects in mid-ocean. Thus naturalists and others ought to clear up the breeding as well as food question. If my remarks stimulate inquiry among sea-travellers my object will be gained. The less practicable though more burning topic of their flight it is not my intention to enter into here.

NOTES ON THE ORNITHOLOGY OF OXFORDSHIRE,
1903.

BY O. V. APLIN, F.L.S.

January 5th.—Very big floods.

7th.—*Galanthus elwesii* and *Cyclamen coum* in bloom. Aconites a fine show. Starlings singing about the buildings as if it were spring. Part of the great host of Wood-Pigeons seem to have gone into the eastern side of the county. Mr. W. Horwood writes from Caversfield: "The Wood-Pigeons are now with us in thousands, feeding on the clover and turnip-tops." They had also countless thousands of Starlings roosting in a cover.

9th.—A Wren roosting in a nest built last autumn in an Irish yew. Just after dusk I was attracted by a twittering note, and traced it to the nest.

13th.—Hard frost for some days. Bramblings with Chaffinches under beech trees.

16th.—Very severe weather. The Hedge-Sparrow is the only bird not silenced, and sings cheerily. Redpolls with Goldfinches feeding in alders. Saw yesterday, at Mr. Bartlett's, a Redwing of a pale warm buffy brown, shot near Banbury. A short time ago I received as a present a white Starling, a bird of the year, hatched at Tadmarton, and killed in June, 1902.

17th.—13° on the grass. The 'Banbury Advertiser' of the 15th contains a note to the effect that Starlings then had young in the gable of a house at Hook Norton. There are "squeaker" Pigeons at a farm here. The frost began on the 11th.

19th.—Thaw. Song-Thrush singing again.

24th.—Nuthatch trilling again, and utters the series of whistles, but has not acquired the long ones yet.

29th.—Very mild weather lately. Nineteen species of plants in bloom in garden.

Rainfall (at Bloxham Grove) 2·58 in. on thirteen days.

February 15th.—Having been away from home since the 30th ult., I find on my return that in consequence of the

wonderfully mild season twenty-three species of garden plants are in bloom. Chaffinch sang a little.

16th.—Blackbird singing.

20th.—Several apricot blossoms expanded, the earliest I ever saw. A lesser celandine flower, and hawthorn leaves three-quarters of an inch long in a spinney at the mouth of this brook. Marks of an Otter's presence.

27th.—Violent storm early, with rain and hail, and blew very hard in the forenoon. This was our share of the great gale which overturned tens and perhaps hundreds of thousands of trees in the west and Ireland. Here the damage done was slight.

The first half of this month was dry and warm. Rain fell on only eight days to the amount of 1.15 in. The old saying that all the months of the year curse a fine February proved a very true one this year.

March 1st.—Violent storm. Bullfinches eating gooseberry-buds, and to-day attacked those of the black currant, on which there are leaves large enough to cover a sixpence. By the next day they had nearly ruined these bushes, and I shot a male with his crop crammed with the fruit-buds. They rarely attack these buds. The pears are too far advanced to be harmed, most of the buds having opened.

3rd.—Grey Wagtail in the brook.

5th.—Starling investigating a nesting-hole.

6th.—Some Bramblings with other small birds on a field of backward young wheat near Wroxton.

10th.—Song-Thrush building in plum on wall again, and again using old horseradish leaf-stems (*vide* 'Zoologist,' 1904, p. 363).

13th.—Hedges quite green in places.

22nd.—Several plum trees in bloom. While watching about a score of bright fresh-looking Meadow-Pipits (migrants) on a hilly grass-field dotted with large ant-hills at Milcomb, I turned the glass on an Alpine or Water-Pipit (*Anthus spinoletta*). It was rather buff than pink underneath, and slightly marked on the breast; eye-stripe conspicuous; grey of the back not very pure. As, when it flew, it did not show *pure* white in the tail, it would be what some people call the Scandinavian form of the

Rock-Pipit, but which I prefer to call the northern form of the Alpine Pipit (*vide* 'Zoologist,' 1896, p. 379). The birds were tame; it was a sunny day, and I had the light at my back, so I was able to see the stranger very well; its large size made it conspicuous among its companions.

23rd.—Song-Thrush's nest with four eggs. One or two Cliff-chaffs (silent) at Wickham.

25th.—A wonderfully early season. Hedges more green than brown. Pear in blossom. 65° in shade!

27th.—Blackthorn in bloom.

28th.—News of first Peewit's eggs, *viz.*, nest of three on the 24th in west Oxon. Also, in that district, of Long-eared Owl sitting on five eggs in an old Wood-Pigeon's nest in a spruce-fir on the 21st, and a Tawny Owl sitting on three eggs in an old Jackdaw's nest on the 25th.

29th.—Chiffchaff sang for the first time. Heard Curlews passing over about 11 p.m., starlight. Country fearfully wet.

31st.—Chiffchaff fairly common. Song-Thrush and Robin breeding freely. Meadows beautifully green; willows with a light green flush; some big thorn-bushes so thick with leaves that at a little distance you cannot see if there is a Magpie's nest in them or not.

March a wet, stormy month, with gales from S.W. and W. The most remarkable point is that there has been no east wind. Rainfall 3.40 in. on seventeen days.

April 2nd.—Bought from Mr. Bartlett a very fine recently killed Moorhen, which measured 13½ in. in the flesh.

3rd.—Saw a Robin's nest in an old tea-pot lodged in a box-bush.

5th.—Peewit's nest with four eggs on Milcomb Hill; a hollow in the turf, well lined with dead grass. Goldfinches noticed recently feeding on seeding plants of *Draba verna*. They are quite common now about the village. I have never before known the gorse-blossom so fine here, the damp mild season having suited it.

7th.—Flock of a score of Fieldfares; quite scarce this season. Fresh-hewn holes of Green and Barred Woodpeckers in willows.

9th.—Willow-Wren. The country about as green as it often is in early May, with the exception of big trees.

12th.—Sharp night frosts (as low as 26° at four feet from the ground) and cold winds set in to-day, and, lasting about a fortnight, completely ruined the promise of the fairest and earliest spring I ever knew. The damage done was very great on account of the forward state of vegetation, the flow of sap being suddenly checked and buds and tender foliage shrivelled up. Early breeding birds and delicate migrants also suffered.

14th.—Put a Crow off her well-concealed nest built against the main trunk of an elm where two boughs sprout out, and quite invisible at a little distance. From this nest four partly incubated eggs were taken on the 18th. I may mention here that I am inclined to think the same pair of Crows bred in the same group of trees the following spring; for on the 19th April, 1904, I found a well-hidden nest in the main fork of an elm a few yards from the nest-tree of 1903, and, on sending the boy up on the 21st, he brought down three partly incubated eggs, which closely resemble those of the previous year. As the eggs are peculiar, of a long green type (unlike any others that I have obtained in this locality), I feel pretty sure that they were laid by the same bird. In both years other Crows were breeding only a short distance away. I had the pleasure of showing Mr. J. Whitaker the hidden nest of 1904, and he was much interested in it. These concealed nests (of which I have seen a good many others) are rather curious, for Crows here more commonly build their nests in conspicuous places. A *possible* explanation of these particular cases may be that the nest-trees are close to a much-frequented cattle-hovel and hay-rickyard, where a few fowls are sometimes kept, and the birds had especial reasons for keeping their presence quiet. When Crows nest in a tall elm they usually build high up among the top branches, and the nest is as conspicuous as a Rook's, although never, I think, quite so near the top or among such small branchlets as Rooks affect. A fair-sized fork, or a fork in the main trunk in an elm, or a drawn-up spinney oak, is often chosen; but in most cases the nest is conspicuous. In spreading hedgerow or solitary oaks the nest is often on a partly horizontal limb where some branchlets break out, at some distance from the trunk, and I once saw one on a thin almost bare bough of an oak which grew nearly horizontally for a space and then turned straight up, and

the nest was perched on the top where the growth bushed out. I do not think any boy, much less a man, could have got at this nest. Crows also build in evergreen conifers (scarce here), or "piney" trees, as they are called locally, near the top and close to the trunk; and I once saw one about twenty-five feet from the ground in the central pole (about five inches in diameter at the base) of a pollard willow, the poles of which had not been lopped; the nest was fixed in the small branchlets. Ash and big old alder trees also are used, of course, but the nest, save in the cases I have especially alluded to (and those in conifers), are almost always conspicuous at a distance. As this destructive bird is too common in this parish, I employed a boy who is a very good climber (and he who would take Crow's eggs here has to be a good one) to harry the nests. In the twelve days (17th to 28th) he raided fourteen nests containing fifty-five eggs. Four is the usual clutch about here, but five is not at all uncommon; the Crow will sit on three, but I have never known six.* The eggs in the clutch usually resemble one another in character, but one is almost always slightly lighter coloured than the rest, and in some cases (more especially when five are to be laid) one egg is quite different, and usually lighter coloured than the others. This odd egg has often a clear greenish blue ground colour, spotted with distinct and sharply defined marks, some very dark. There are, of course, many exceptions, greater and less, but on the whole I think this is a fair description of the Crow's eggs found here. I have a clutch of four, all of which differ from one another considerably. The normal variation in size, shape, and colour is very great, and I have some curious eggs, and even clutches, which can only be considered abnormal. A large Crow's egg weighs over $\frac{3}{4}$ oz.; a small, slender one over $\frac{1}{2}$ oz.

15th.—Young Mistle-Thrushes flew.

(To be continued.)

* Mr. R. W. Calvert, however, tells me that some years ago he has more than once found six Crow's eggs in a nest in the range of woodlands near Burford known as Widley Copse, Hens Grove, and Stockley Copse (formerly part of Wychwood Forest), at that period not yet given over to Pheasants, and a great resort of Crows, Hawks, Owls, and Foxes.

THE RÉUNION STARLING.

BY GRAHAM RENSHAW, M.B., F.Z.S.

“BEFORE the paper is decayed on which this animal has been figured it will be ranked amongst those species which have perished from the face of the earth.” So wrote Darwin in 1839 of the Falkland Island Wolf. His prediction, unhappily fulfilled by the destruction of the last survivor at Shallow Bay in 1876, might have been safely made of many other species, especially amongst birds. The White-winged Sandpiper of Tahiti, the Black Emeu, the Norfolk Island Parrot, the Philip Island Parrot, and the Mamo of the Sandwich Islands instance but too clearly the ease with which a species—and especially an island species—may be exterminated. Upon the fauna of the Mascarene Islands this disaster has fallen heavily, if one may judge from the list of vanished birds. The Rodriguez Owl (*Athene murivora*), the Mauritius Dove (*Alectoœnas nitidissima*), and the Mauritius Crested Parrot (*Lophopsittacus mauritianus*) are cases in point, though less familiar instances than the Dodo and Solitaire. On Réunion there formerly abounded a very curious bird, the *Fregilupus*, or Crested Starling.

The Réunion Starling (*Fregilupus varius*) measured about twelve inches in total length. It was remarkable for its somewhat elongated, slightly curved, and sharply pointed beak; for the compressed, Hoopoe-like crest on its head; and for the strong curvature of the claws on its large feet. The head was of a light ashy grey colour, and the feathers of the crest had white shafts; the cheeks, throat, and under parts being white. The mantle, wings, and tail were ashy brown, the two latter being tinged with grey, as if they had been powdered; the lower back, rump, and upper tail-coverts were faintly washed with rufous. There was a large white spot or speculum on each wing. The beak was orange; the claws were citron-yellow. The iris has been figured as red or orange, and also as blue and brownish

blue; although the latter tints have been supposed to have been due to the imagination of the artist, it is possible that they are quite correct, the purer blue belonging to fully adult birds. At any rate, one finds blue eyes amongst the surviving *Sturnidæ*, as the Andaman Starling, for instance. The tongue of the *Fregilupus* was frayed at the tip into several bristles; the palate was studded like that of a Bird of Paradise with a number of tubercles, doubtless to assist in holding the food. Although the nest and eggs of the Réunion Starling are undiscovered, immature birds are known to have been browner than the adults, with the crest small and brownish instead of white. The weight of a *Fregilupus* in the flesh was said to be about four ounces.

The Réunion Starling appears to have first become known to Europeans in the seventeenth century. De Flacourt, the Directeur Général de la Compagnie Française de l'Orient, and better known, perhaps, as the chronicler of the fabulous Roc, observes, in his 'Histoire de la Grande Isle Madagascar,' an octavo volume published in Paris in 1661, "Tiuouch c'est la huppe, il est tacheté de noir et de gris, et a une belle crest de plume." This mention of a crested Hoopoe-like bird might well refer to the native Starling; but since (as pointed out by Levaillant) the *Fregilupus* has not a particle of black about it, perhaps Buffon should be considered the first describer of the bird, since he examined and figured an undoubted specimen in the Paris Museum. Strangely enough, he also styled it "la huppe noire," perhaps on the *lucus a non lucendo* principle!

As far as can now be ascertained, the habits of the Réunion Starling much resembled those of its living congeners. Occurring in great flocks like the Rosy Pastor (*Pastor roseus*) of to-day, it swarmed in the damper portions of the island, frequenting the marshes, and greedily feeding on seeds, and on the berries of the pseudo-buxus. The Starlings also attacked the coffee plantations, where they are said to have made dire havoc; their large feet and curved claws would enable them to cling securely to the bushes and branches which they rifled. Enjoying liberal supplies of food, these birds became fatter and heavier than usual during June and July. Perhaps continual gorging dulled their wits, for they became so tame that the Creoles were able to approach close enough to kill them with sticks. The Starlings were called

“Martin” by the Creoles, a name also conferred on the Mynah (*Acridotheres tristis*), which had been introduced into Réunion from India.

The actual date at which the *Fregilupus* was exterminated will probably never be known. It was apparently abundant as late as the beginning of the last century, about which time Levaillant expressed the hope that some day travellers would give to the world the history of so common a bird. He had a specimen in his own collection, and knew of seven others; yet no ornithologist of repute seems to have met with the bird till M. Jules P. Verreaux, about 1833, obtained an example. In the short space of thirty years the Réunion Starling had become almost extinct; Verreaux used, indeed, to boast that he had shot one of the last of them. The bird seems to have first vanished from the coast and the mountainous districts near the sea. Professor Schlegel, then Director of the Leyden Museum, made, about 1868, special inquiries for the Crested Starling, a bird of which for many years previously nothing had been heard. He was assured that it yet lingered in the forests of the interior near Saint Joseph, though he does not seem to have obtained a single example. M. A. Legras, an able ornithologist actually resident on the island, had scarcely seen a dozen specimens in all his naturalist wanderings. A photo-engraving of the “Pointe de Saint Joseph” is now before me. This last refuge of the *Fregilupus* appears as a wild headland projecting into the sea, into which it is continued for some distance as a chain of islets; it is well clothed with grass and bushes, being luxuriantly fertile to the water’s edge. One may perhaps fix 1860 as the approximate date at which the Réunion Starling was exterminated. Emile Trouette, in 1671, described Réunion as a huge forest peopled with birds of brilliant plumage, ignorant of the wickedness of man, who was able to destroy them. Poor things! if they were at first ignorant, they soon learnt their lesson from the sticks of the Creoles whose coffee-bushes they had rifled!

The actual cause of the extinction of the native Starling is not accurately known, though it is possible that it was exterminated by the coffee-planters. Introduced into Réunion in 1717, the coffee industry was for many years a very important and famous feature of the island; the greedy *Fregilupus*, swarming

in hungry flocks, would be by no means *persona grata* to the planters. Perhaps they purposely aided its exit, as the Sheep-raisers of the Falkland Islands destroyed the Antarctic Wolf; the very stupidity of the birds would go heavily against them, as it has done with many other island species. There is also reason, from the structure of the leg and foot, for supposing that the Crested Starling was largely a ground bird. It would thus be exposed to attacks from enemies other than man. Réunion forming portion of the "French Indies" eventually became largely peopled with Hindoos, and the Indian Mynah (*Acridotheres tristis*) was introduced. A burly wideawake bird, the Mynah soon multiplied on the island, being an alert destroyer of grasshoppers and similar prey. It may have indirectly destroyed the *Fregilupus* by sharing its food too liberally, or by feasting on its eggs and young. Any one who has ever kept a Mynah will recollect the avidity with which these almost carnivorous birds swallow pieces of raw meat. The rapidity with which the English Sparrow, introduced into the colonies, has driven away the native birds well illustrates this suggestion.

Cadit rem. The Réunion Starling has vanished utterly; even as a museum specimen it is exceedingly rare, and the following census seems to comprise all of them:—

1. Specimen in Paris Museum, figured and described by Buffon, and mentioned by Levaillant.

2. Fine bright example, also at Paris, sent in 1833 by Mr. Nivoy. Examined and measured by the late Dr. Hartlaub many years ago. Said to measure eleven inches in total length.

3, 4. Spirit specimens in the Paris collection. The soft parts of *Fregilupus* being so imperfectly known (the palate and tongue being apparently the only parts hitherto examined), one of these might well be dissected. This could be done without destroying it, actually enhancing its value.

5. Example in Levaillant's collection. Perhaps the specimen of the "Madagascar Hoopoe," which Latham, in 1783, mentions as having been only $9\frac{3}{4}$ in. long. The bird figured by Latham was itself apparently immature, judging from the brownish tint of the upper plumage. See his 'General History of Birds,' vol. iv.

6. Specimen said by Levaillant to have been preserved in the

cabinet of M. Mauduit (probably = M. J. E. de la Varenne Mauduyt, who published two volumes on birds in London in 1784).

7. Specimen seen by Levaillant in the collection of M. Raye at Amsterdam. Of this example nothing seems to be known, and it has probably perished. The same remark applies to (8) specimen in cabinet of M. Gigot Dorey (9), of M. Poissonier (10), and of the Abbé Aubrey, all of which are mentioned by Levaillant.

11. An old specimen is preserved in the Leyden Museum.

12. Another example (probably the one studied by Sundevall) is in the collection at Stockholm.

13. A *Fregilupus* was preserved in the museum of the late Baron de Selys Longchamps, well known as a keen entomologist, especially as regards Odonata.

14. Another specimen is preserved at Caen.

15. Examples are in the museums of Pisa (15), Genoa (16), Turin (17), and Florence (18), being specimens given to Professor Savi previous to 1873 by a Corsican priest named Lombardi. Retaining only one for the Pisa collection, Savi generously distributed the others amongst his less fortunate colleagues. Assuming the birds to have been shot about 1860, these would be amongst the last of their race. The two examples (19, 20) added to the Port Louis Museum, Mauritius, should perhaps also be ranked as such.

21. In 1889 the collection of Count Riocour, whose grandfather had been an intimate friend of Vieillot, was dispersed at Vitry la Ville, near Châlons, owing to the death of the owner. Most of the series became the property of M. A. Boucard, including a *Fregilupus* mounted on a stand, afterwards obtained for the British Museum. I remember this specimen as exhibited many years ago in a special glass case at the Natural History Museum. It has now been removed to the students' collection, where I have again examined it. The only other example in this country appears to be the skeleton (22) made by Jules Verreaux from a bird which he shot in 1833, now in the Cambridge Museum. A few feathers adhere to one leg, and the orange covering of the mandibles has been partly retained. Another skeleton (23) is said to be preserved at Paris. With this statement is completed the history of the Réunion Starling.

SUPPLEMENTARY NOTES ON THE BIRDS OF ANGLESEA.

By T. A. COWARD.

(Concluded from p. 386.)

TUFTED DUCK.—On another water I saw a pair of Tufted Ducks on April 17th and again on May 7th, but I cannot say if these were migrants or breeders.

GOLDEN-EYE.—On April 15th and 17th there were single brown-headed Golden-Eyes on two different waters, and on the 22nd four together.

SCOTER.—When on the rocks at Parc Point on April 21st I looked right down upon a drake Scoter which was swimming close inshore; the orange-yellow patch round the nostrils was most conspicuous, seen from above.

QUAIL.—A gamekeeper told me that in the spring of 1904 he heard Quail calling on Bwrrdd Arthur, but he had not heard anything of them this spring.

WATER-RAIL.—In March, 1905, this same keeper reported a Water-Rail on Llyn Bodgolched.

RINGED PLOVER and DUNLIN.—The resident Ringed Plovers were in noisily anxious pairs when I arrived at Rhos Neigr; but on April 15th, and on many subsequent days in April and May, I saw parties, varying in size, of Ringed Plovers and Dunlins. These migratory Ringed Plovers were noticeably smaller than the resident birds, and at times when some of the smaller race invaded the chosen stretch of beach of a pair of the residents they were chased away by the birds in possession. Most of the Dunlins were black-bellied birds. On May 2nd I found that the numbers of these two species were considerably increased. On May 12th–14th, and on May 21st, the flocks of these birds were largest, several of them numbering from fifty to one hundred birds.

TURNSTONE.—Occasionally small parties of Turnstones fed on the shingle or amongst the tangle, at times alone, and at times

with the other waders. The first party—eight birds—I saw on April 28th; two of these were old birds with white heads and much brighter orange legs than the younger birds. They were feeding amongst the stones, turning them over with a smart upward throw, and immediately darting upon anything which had been concealed beneath. On May 29th Mr. Aplin and I watched a strange gathering of birds at the spot on the beach where the White Wagtails were always to be found. A number of domestic fowls had come down from the little whitewashed cottage close to the shore, and were scratching in the damp sand near to and beneath the drifted and rotting seaweed. Amongst them half a dozen Turnstones were eagerly feeding, some of them following the fowls and carefully examining the raked-up sand and small stones. A number of Starlings, a few White Wagtails, and one or two Swallows, which occasionally settled on the weed to feed, completed the strange gathering, which, in the strong light on the blue-grey rocks and rich red weed, made a beautiful as well as curious picture. Two of the Turnstones were old birds with rich chestnut backs and very white heads. When we examined the sand where the birds were so busy, we found a small grub, which appeared to be the larva of some dipterous fly, buried in the sand beneath the decomposing seaweed.

WOODCOCK.—In a wood near Beaumaris I flushed a Woodcock from the dry bed of a stream on June 7th. It flew through the wood, dodging round trees, but keeping to the line of the ditch. I followed the ditch, and shortly came upon the bird standing in the ditch motionless, its bill almost touching the ground. When it rose again I lost sight of it. The keeper has never known the bird to nest in these woods, but they are good places for “cock” in autumn.

LITTLE STINT.—On April 28th a couple of Little Stints were on the beach with some Ringed Plovers; one bird, presumably a female, was slightly larger than the other. The birds were in summer dress, with rufous breasts, hardly so warm as the breasts of Sanderlings at this season. At first they fed with some Turnstones, which looked giants beside them. At times they pushed their bills deeply into the sand, but usually pecked after the manner of Sanderlings; indeed, though in plumage they

resembled small light-bellied Dunlins, their actions were far more like those of the Sanderling than the Dunlin.

SANDERLING.—Sanderlings were less abundant in April than in May. On April 15th I saw a single bird with a small party of Ringed Plovers and Dunlins, and once or twice thought that I detected others amongst distant flocks of Waders. On May 21st there were three with one flock; but on the 29th Mr. Aplin and I saw a party of perhaps a dozen resting on the sand at the mouth of the river, and Messrs. Oldham and Cummings came across two other flocks numbering about thirty birds each. On the 31st we saw many with Ringed Plovers and Dunlins in the Malldraeth Estuary.

COMMON SANDPIPER.—The Common Sandpiper reached Rhos Neigr on April 17th. I saw five on that date, and later met with birds on all the llyns and streams. I did not notice any passing birds on the beach.

CORN-CRAKE.—The first Corn-Crake I heard was calling on Holyhead Mountain on April 26th, and birds reached Rhos Neigr about four days later. The Corn-Crake was generally distributed and abundant after the rush on May 2nd.

WHIMBREL.—The Whimbrel arrived in the third week of April. I saw one bird within a few yards of the wall of the Holyhead Road where it crosses the Strait between Anglesea and Holy Island on April 19th. After this I met with odd birds or parties, both inland and on the coast, throughout April and May. On May 4th one flock numbered ten birds, and later I saw two, both inland, which contained seventeen each. There were Whimbrel still about at the beginning of June.

LITTLE TERN.—I did not notice any Little Terns until May 6th, but from then until the 12th, when a number came in and took possession of their usual shingle beach for nesting purposes, there were always one or two about the beach.

COMMON and ARCTIC TERN.—Birds of one or the other species were about by May 17th. One which I picked up, its head having been ripped off, probably by a Peregrine, was an Arctic.

KITTIWAKE.—On April 21st there were a number of mature and immature Kittiwakes on the beach at Aberffraw, at the estuary of the Ffraw.

PUFFIN.—The Puffins at the South Stack were not much in

evidence on April 26th. I saw no birds on the grassy ledges where they nest, though some may have been in the holes; there were, however, a party of eleven on the water.

BLACK-THROATED DIVER.—On April 21st, off Braich Llwyd, at the northern end of Aberffraw Bay, I watched a Black-throated Diver for some time. The bird was in summer dress, with slate-grey head and neck. The black throat and half-collar of white were very conspicuous. The bird gradually drew away further out to sea, but continued feeding so long as I could see it; its dives at times lasted for about thirty seconds, and it often brought up flat fish from the sandy bottom of the estuary. When one of these was brought to the surface the bird seemed to bite it over and over again as if to break it up before swallowing it.

RED-THROATED DIVER.—On the same day, a few miles from the same spot, I saw an adult Red-throated Diver. It was near enough for me to see, with the aid of my telescope, its slate crown and nape, red throat, and slightly upcurved bill. It was also diving, but did not remain long in sight, for after a time it rose and flew out to sea.

NOTES AND QUERIES.

MAMMALIA.

Habits of the Noctule (*Vesperugo noctula*).—In the October number of 'The Zoologist' (p. 397), Major G. E. H. Barrett-Hamilton asks for any information respecting this fine British Bat; so perhaps the following description of a large colony may prove of interest to him and other readers of this Journal:—During the early summer of the year 1890 I went to live in King's Lynn, and resided there for the most part until the autumn of 1892, since which time I have paid annual visits for a few days at a time, chiefly during the month of June. Soon after my arrival I became acquainted with a large colony of Noctules which had taken up their quarters in the roof under-drawing of a three-storeyed and fairly modern house in one of the leading thoroughfares (London Road). This house was then owned and occupied by an eccentric character named Brooks, but, with the exception of a bed and a chair or two, was not furnished. For several years after 1891 it was untenanted excepting by the Bats in the roof. In the spring these Bats were neither seen nor heard until about the end of April or early May (according to the season), when small parties would make their appearance in the evenings. As the weather became warmer in May a greater number would come forth each night for the evening flight. Towards the end of May and in early June the numbers leaving nightly were almost incredible. I have myself several times counted in one evening more than two hundred (the greatest number being two hundred and forty-five), whilst some young friends who lived in the next house have upon several occasions carefully counted close upon three hundred leaving in one evening. Towards the end of June they rapidly decreased in numbers, until well on into July, when not a single Bat would leave the dormitory, although numbers would be seen hawking in the air each evening. Nor would anything further be seen of them either leaving or returning to their resting-place that year, but the following spring they would issue forth exactly as they had done the year before, and this was continued annually. For ten or a dozen years, to my knowledge, these Bats had things to their liking, were not interfered with in their lodgings,

and slightly increased in numbers annually. The present occupiers of the house, however, objected to their presence, chiefly owing to the squeaking noises which they made. Last year they were ill-advised to securely fasten a piece of tin over the hole *in the early spring*, in order to keep the Bats *out*, whilst really they fastened them *in*. As the time advanced past the date for their appearance, I am told by the neighbours that the noises (squeakings) of the imprisoned Bats were terrible to listen to for about a fortnight; but eventually they succeeded in forcing one corner of the tin away, and many of them managed to squeeze out and get free, though, judging from the numbers seen, more had died inside. The aperture which formed the only entrance and exit of their chamber was a very small one (just large enough for one Bat at a time to crawl through), and was situated at the gable end of the house, where the brick wall and roof joined, and close to the spout. They commenced to come out, as a rule, about an hour before sunset, and sometimes it would take quite an hour and a quarter between the arrival of the first and the last. The order of their leaving was very curious. A loud squeaking would be heard for a minute or two near the inside of the hole; then a Noctule would appear, and launch itself into the air, followed in quick succession by four or five more. Then silence ensued for a minute or so, followed by the squeaking noises again, and another party of five or six would follow each other out. This mode of procedure would be carried on continuously. Silence, squeakings, and then Bats in constant succession. Most of the "parties" consisted of from five to eight individuals, though on occasions (particularly on evenings when the greatest numbers were leaving) I have seen as many as a dozen or more follow each other out without a break, but this was exceptional. These small parties were called families by my friends, but they scattered off individually and in separate directions immediately they were clear from the hole. Soon after dark the first of the returning Noctules would be heard fluttering to get back again into the hole, after which the fluttering would be continuous for an hour or more as they all returned. My young friends next door took advantage of this, and by means of a fishing-rod held from an upstairs window were able to knock down a good many into the yard below. From time to time I must have examined at the least seventy or eighty Bats from this colony. They were all Noctules, the largest measuring $14\frac{1}{2}$ in. from tip to tip of expanded wings. I never saw any very young ones, although several, by their smaller size, I took to be immature. Both sexes were represented, and as far as I can remember were in about equal proportions. The stomachs of several which I examined contained chiefly broken elytra or wing-cases

of beetles, some containing those of the large dor-beetles. After quitting their home in late June and early July this colony of Bats evidently "camped out" for the remainder of the summer, either in the woods or elsewhere. The most curious thing, however, was that we could never see or hear them returning to their winter quarters after the summer was over. Probably they returned singly and silently in the autumn, as they were always there again when the spring came round. This was proved during the autumn of last year. The hole having been again securely nailed up, for more than a week the Bats tried to get in nightly, and in the mornings several were found in the back yard, badly maimed in their endeavours to find or force an entrance. During the present year they have not attempted to regain admittance into their old quarters, so no doubt they have given them up for good and gone elsewhere. For my part I am very sorry, as this colony was always a feature of great interest to me when in that neighbourhood. I have longed many times to enter their dormitory and examine them in their winter sleep, but this would have been impossible, except by removing part of the slated roof. North-west Norfolk must be a good field to work for any one interested in Chiroptera. Bats are certainly very numerous there, although, besides the Noctule, I had only the opportunity of identifying the Pipistrelle (*V. pipistrellus*) and the Long-eared Bat (*Plecotus auritus*). The latter I met with several times during the day in barns and hay-lofts near farmhouses.—HARRY B. BOOTH (Shipley, Yorks).

Sorex minutus in Shropshire. — On Oct. 6th last I picked up a female Lesser Shrew on the Long Mynd, Church Stretton, at an elevation of over 1500 ft. It was lying dead on one of the grassy tracks through the heather. It was a little difficult to measure, having apparently been trodden upon, but the head and body were about 50 mm. and the tail 40 mm. in length. The species has been previously recorded for Shropshire (H. E. Forrest, 'Zoologist,' 1900, p. 186), but I do not know if it has been met with in England at so great an elevation; in Scotland, however, it appears to ascend to a much greater altitude, for one was brought by a Cat into the observatory on the summit of Ben Nevis ('Annals of Scottish Natural History,' 1897, p. 42).—T. A. COWARD (Bowdon, Cheshire).

White Stoat.—A very fine male Stoat (*Putorius ermineus*) in perfect white winter dress was sent for preservation to Mr. Travis, from Cavenham, near Bury St. Edmunds, about the last day of September. I saw it about a fortnight later, and Mr. Travis, who has had dozens of Stoats through his hands, told me that a white one at this time of the year

was quite unique in his experience. He considers that white Stoats occur quite as frequently in mild winters as in severe weather.—
 JULIAN G. TUCK (Tostock Rectory, Bury St. Edmunds).

AVES.

Nightingales in Algeria singing in August.—English ornithologists are seldom in North Africa in August, and it may be worth while to record the fact that on Aug. 31st last the Nightingales were in full song in a ravine at Hammam Meskontine, in Eastern Algeria, at 9.30 a.m., and in a blazing sun. This information comes to me from a naturalist friend, the Rev. A. H. Cooke, who had been observing successfully the total eclipse of the sun the day before. Whether this indicates a second or even a third brood in the season, or whether it corresponds to what we call here an autumn song, I will not attempt to decide. With us, of course, they breed but once, and I have never seen a record of Nightingales singing after June. I have heard them in full song on the Lago Maggiore in the first week of July, and it would seem that the further you go south the later they can be heard singing.—W. WARDE FOWLER (Kingham, Chipping Norton).

Breeding Habits of the Great and Blue Tits.—With regard to Mr. Jourdain's note on this subject (*ante*, p. 309), I have never known a case of the Great or Blue Tit rearing two broods in the year. In my experience none of the *Paridæ* are double-brooded, at any rate in the north-west of England. I agree with Mr. E. P. Butterfield that the question of some of the resident birds breeding twice is open to doubt. Take, for instance, the Mistle-Thrush and Chaffinch; both these are undoubtedly only single-brooded in this district, though very exceptionally they may rear two broods in the season.—S. G. CUMMINGS (Chester).

White Wagtails in Autumn in Cheshire.—Very little appears to be known in this country about the autumn migration of the White Wagtail (*Motacilla alba*). It may, therefore, perhaps be worth recording that on Sept. 3rd Mr. C. Oldham and I saw at close quarters four birds of this species on the Dee marshes at Burton, Cheshire. Two were adults in winter plumage, and two were presumably young birds of the year. A few days later I saw a solitary adult bird in the same locality, in the company of a few Pied Wagtails.—S. G. CUMMINGS (Chester).

Late Martins' Nests.—What is the latest date on which Martins have been observed feeding their young in the nests? They seem to

me to be much later than formerly, I believe owing to the persecution from the House-Sparrow; they are—in towns, at all events—often compelled to begin breeding after the Sparrows have finished. Three years running I have noticed one nest in particular as being extra late, and in each year I have found the young birds dead on the pavement below after the parents had left. This year they were seen feeding at the nest Oct. 14th, last year (1904) on Oct. 10th, and in 1903 it was well into October, but I have not kept a record of exact date. Chiffchaffs were “chipping” here as late as Sept. 15th.—R. B. LODGE (Enfield).

Greenfinch and Hedge-Sparrow rearing each other's Young.—Mr. Ellison's suggestion (*ante*, p. 391) that the Greenfinch, from its habit of feeding its young on predigested seeds, would not be a suitable foster-parent to the insectivorous young Cuckoo, makes me think it advisable to describe an experiment I made some thirty years ago in transposing the newly hatched young of a Hedge-Sparrow and those of a Greenfinch into each other's nests. I put two young Hedge-Sparrows into the Greenfinch's nest, and two young Greenfinches into the Hedge-Sparrow's, leaving in each case to the parent birds two of their own young to be brought up with two little strangers of equal age. It may seem a singular fact, but it is a fact, that both these mixed broods were successfully reared. At the end of about ten days—I do not remember the exact period—I found the young Greenfinches in the Hedge-Sparrow's nest, and the young Hedge-Sparrows in that of the Greenfinch, as well developed and (to all outward appearance) as thriving as their brothers and sisters in the nests of their proper parents. I changed the birds back before it was time for them to fly, so the experiment was not pursued to the very end; but, as far as the first ten days or so are concerned, I think it shows that one need not feel sceptical as to the competence of the seed-eating Greenfinch to rear the insectivorous Cuckoo. A course of feeding which agrees with the young Hedge-Sparrow should surely agree with the infant Cuckoo also.—C. B. MOFFAT (36, Hardwicke Street, Dublin).

Increase of Goldfinches.—The “scheduling” of the Goldfinch in Middlesex and Herts has had a good effect. There are now immense numbers of Goldfinches on the thistles, a large percentage being young birds. These, I believe, have been bred in the neighbourhood, chiefly in the extensive market-orchards.—R. B. LODGE (Enfield).

Breeding Haunts of the Twite (*Linota flavirostris*).—I was more than a little surprised to read (*ante*, p. 390) Mr. Allan Ellison's reply

to the further inquiry of Mr. Wilson *re* Twite and its distribution, wherein he states that "the bird breeds in most parts of the British Islands where moors, mountains, and exposed heathy places are found, being by no means confined to the northern parts." Now, it would be most interesting to have further particulars of these "most parts of the British Islands." In Wales I never was successful in finding it nesting, although I am fully convinced I looked for it in what I deemed very suitable places. I have it from very good authority that days have been spent trying to locate the breeding of this species in North Wales without success. It occurs there in winter fairly plentifully. The Twite breeds on some of our hilly bracken-covered slopes in the West Riding, as I have before stated, in little colonies; yet on an adjoining moor similarly placed, and to all appearances and aspects equally suitable as a habitat of the Twite, not one can you find, so that there is a something more than we reckon in the suitability of the breeding-site. I can hardly think the Twite a common bird in all—even hill or moorland—districts, or the collectors would not be so keen on clutches. Our Bradford naturalists, I am pleased to say, are not collectors, but many are the useless offers they get to exchange for the eggs of this species. One day in 1904 my son and I found six nests—four with six eggs, one with four, one with three; two latter perhaps not laid up. Every one of these nests had the conspicuous feather (occasionally two) that we Bradfordians have noted so frequently when photographing the nest, so that we expect always to find this odd adornment. I was mentioning this circumstance to our friend Mr. Forrest, of Shrewsbury, whilst he was with us on a Twite-nesting expedition; we found No. 1, and after a careful examination could not find even the odd feather; again we find another—not a feather in it; another surprise! This, too, when we had almost come to believe that, as far as our own district colony was concerned, Twites never built without this adornment! Only a few days later, and every nest found contained a feather (or feathers), mostly the hackle-feathers of the farmyard rooster. I mention this circumstance more to point out how one can get a fixed idea of the invariable rule of certain birds to use certain building material, and yet all at once this habitual order is altered, and in this case recontinued at a very little later period.—W. H. PARKIN (Studholme, Shipley, Yorks).

Cuckoo and Twite. — Mr. Parkin stated (*ante*, p. 348) that the bird-lovers in this district had paid great attention to Mr. W. Wilson's former statement in 'The Zoologist,' that in the neighbourhood of Aberdeen the Twite was *always* chosen as the foster-parent of the

Cuckoo. As I happened to make Mr. Wilson's acquaintance on the first day of the gathering of the Fourth International Ornithologists' Congress at London in June last, I lost no time in broaching this subject. From Mr. Wilson's description of the nest and eggs, and also from the site of the nest, I was certain that his bird was the Meadow-Pipit, and not the Twite, as I assured him at the time. However, all ornithologists and all searchers after truth in nature must feel grateful to Mr. Wilson for losing no time in publishing his mistake and the correction of it himself. In commenting on the above, Mr. Allen Ellison (*ante*, p. 390) asks for an authentic instance of the depositing of a Cuckoo's egg in the nest of a Twite. Unfortunately I have never actually found one myself, although I have examined many scores of Twites' nests, and in districts where Cuckoos are also plentiful. But that the Cuckoo does occasionally deposit its egg in the nest of this species is certain. Mr. James Ellison (a veteran birdnester), of Steeton, near Keighley, has come across several such instances, and I have seen some of the sets. In the year 1889 he showed me a clutch of Twite's eggs containing also an egg of the Cuckoo (all unblown and all slightly incubated) which he had just taken, and later during the same day he pointed out the Twite's nest on the moor whence he had taken them. Mr. James Ellison knows the Twite and its nest and eggs well, as I can personally testify, and I have no reason to doubt his word that altogether he has found Cuckoo's eggs in Twites' nests on, at the least, half a dozen occasions, although he has never met with a young Cuckoo in one of their nests.—HARRY B. BOOTH (Spring Royd, Shipley, Yorks).

The Cuckoo and its Foster-parents.—Probably the most complete list of foster-parents of the Cuckoo compiled by any British naturalist is one drawn up by Mr. W. Wells Bladen in 1896, of which I possess a copy by his kindness. The catalogue contains in all one hundred and forty-three species, in which the Twite is included, Mr. Bladen himself possessing the egg taken in Yorkshire. I have never seen a young Cuckoo in the nest of any of the Finches or Buntings, but our collection here contains a Cuckoo-Greenfinch clutch (four) taken by myself, and a few years ago a friend of ours had a Cuckoo's egg in a Greenfinch's nest in his garden. There were five eggs of the foster-parent, and my friend, who was a clever aviculturist, wished to see whether the Greenfinches could rear a young Cuckoo. He was strongly of opinion that they could not do so, but the nest was destroyed before the egg hatched. Three times I have had the Cuckoo's egg with those of the Bullfinch, all of which I believe to be perfectly genuine, though

there can be little doubt that there are a great many spurious Cuckoo-clutches in existence. In some cases a genuine Cuckoo's egg is added to a clutch of eggs which the Cuckoo herself never saw. Sometimes the imposition goes further, and only this last season a young friend of mine was taken in by a clutch of four Yellow Wagtail, with a palpable Sky-Lark's egg added to it. I blew this clutch myself, and there was no room for any doubt about the matter. The finding of a Cuckoo's egg in a Dabchick's nest seems to admit of a possible explanation that a Cuckoo may have used a Dabchick's nest as a temporary convenience on which to lay her egg, and was disturbed before she could take it away to deposit it in a Reed-Warbler's nest or other suitable nursery. — JULIAN G. TUCK (Tostock Rectory, Bury St. Edmunds).

[Mr. Bladen's list (published, I believe, privately), including the Twite, is also to be found in the 'Trans. N. Staff. Nat. Hist. Field Club,' March, 1896, where the Twite is again referred to as in Dr. Rey's list in 'Kuckucks.' In addition to Mr. Bidwell's list (1884), to which I referred (*ante*, p. 391), the same writer subsequently gave a "List of Western Palearctic species in the nest of which the Cuckoo's egg has been found" ('Bull. B.O.C.' v. pp. xxxii-v (1896)), in which he again included the Twite. A lengthy and excellent paper on the Cuckoo will also be found in 'Verh. Ornith. Ges. Bayern.' 1903, Bd. iv. pp. 123-178, entitled "Der Europäische Kuckuck," by J. A. Link.—ED.]

Late Stay of Swift.—As supplementary to my note on summer migrants (*ante*, p. 359) the unusually late stay of Swifts may be mentioned. The main body seemed to depart, as usual, about the middle of August, but stragglers were seen fully a month later. I saw one near the church-tower on Sept. 17th, and two days later a friend saw another, and, strange to say, he shot a Wigeon the same evening; it is not often the two species are met with on the same date. I saw a single Swift almost daily to Sept. 30th, and my ornithological friends reported it, or another, up to Oct. 12th or 14th. Whether the same bird I cannot say, but a single specimen was seen in widely separated localities, sometimes alone, but often mingling with the few late Swallows. The somewhat severe hoar-frost we experienced since the dates above mentioned, I suppose, either killed the bird or constrained it to seek a more hospitable climate; but why did a single bird remain? Immaturity and consequent inability for long journey has been suggested, but its strength of wing would negative such a proposition, whilst the family cares of a late brood might have been an item in the delay; yet in some cases it has been observed that the desire for migra-

tion has overcome the otherwise powerful instinct of maternal love—late broods of House-Martins, &c., to wit.—G. B. CORBIN (Ringwood).

How does the Osprey carry its Prey?—In all the pictures I have seen of the Osprey carrying a fish, the bird has invariably been represented as gripping its prey by the middle in a parallel position. Although my experience of these handsome birds is an extremely limited one, yet I have had the pleasure of watching them bringing food to their young, and on that occasion, at any rate, all the fish they brought were carried by the head or gill-covers, their tails hanging straight down from the bird's talons. As I think this an interesting point, I should like to learn the experiences of some of your readers on the subject. Perhaps those who have had the good fortune of observing the bird in America may be able to say whether my observation is exceptional. It is possible that different Ospreys may carry their prey in different ways, and that is the point on which I should be glad to have some light. — A. H. MEIKLEJOHN (1, Colville Houses, Colville Square, W.).

Spatula clypeata in Surrey.—The Shoveler is perhaps of sufficiently rare occurrence in Surrey to make it worth while to record that on April 19th last I saw a pair on a large pond in the neighbourhood of Lingfield. By using a little caution I was able to get fairly close to them, and with the aid of a powerful glass could see the details of their plumage very well. I noticed that they sat considerably lower on the water than some Mallards which joined them, and on being disturbed, after flying round in circles, returned most persistently to the weedy corner of the lake where I first detected them. I have noticed that Mallards, after circling round in a similar manner, usually fly right away, and settle on some distant part of the water.—C. H. BENTHAM (Oxted, Surrey).

Grey Phalarope in Cheshire.—For about ten days in September a Grey Phalarope (*Phalaropus fulicarius*) frequented Redesmere, a large sheet of water near Chelford, Cheshire. On the evening of Sept. 19th I was told by a farmer that a strange bird of a kind he had never seen before had been swimming near him when he on the previous evening was in a wood which borders the mere. Soon after I entered the wood I saw the bird on the water at some distance from the shore, but after I had waited for a few minutes it came nearer, flying and swimming, until it was within a few yards of the bank. The bird was in winter dress; the forehead, chin, throat, breast, and belly were pure white, the back pearl-grey; the wings mottled with grey and white. A black or very dark grey streak extended from the black crown down the nape

to the lower neck, where it widened out, the grey being paler on the sides of the neck. A dark streak, from in front of the eye, extended backwards along the ear-coverts, but did not meet the markings on the nape. The bill was black. On the 21st I saw the bird again, and two days later it was seen by Mr. C. Oldham and Mr. J. J. Cash; one of the farmer's sons noticed it for the last time on the 29th. I watched the bird on the two days for perhaps an hour and a half altogether, and during the whole of that time I never saw it still for more than a second or two; it was constantly swimming or flying, the flights being generally short, though once or twice it flew for a long distance. As a rule it spent its time in the lily-beds, snapping at the insects which were flying over the water, or picking something up from the surface. When swimming it moved with the peculiar jerky action so characteristic of its family, darting first to one side, then to the other. Often it mounted on a lily-pad, ran across and slipped into the water on the other side, but I never saw it stand on a pad to rest, nor, while I watched it, did it go to the bank. On the 19th the bird took several short flights, flying from side to side, and snapping at insects in the air; it reminded me a little of a Wagtail feeding on insects which are flying a foot or so above the ground, but I never saw it actually hover. It flitted rather than flew above the water. When on the wing it often uttered a low, short whistle, and when catching flies on the wing it generally allowed its legs to dangle beneath it, only gathering them up when it flew for some distance. The Grey Phalarope is a casual autumn visitor to Cheshire; birds have been obtained in August and November, but the majority appear to have visited the county in September and October. On Sept. 28th, 1900, one was killed near Mobberley, but I have not heard of any occurrences of the species between that date and this.—T. A. COWARD (Bowdon, Cheshire).

Breeding Habits of Birds.—In reference to this subject (*ante*, pp. 309 and 346) there seems yet plenty of room for further observation. Taking a midland county—as, for instance, Bedfordshire—I have so far come to the following conclusions:—All species will lay at least a second clutch of eggs should the first have been destroyed, but if the second are also robbed, or for some reason deserted, with many species a third laying is not attempted; neither does this rule hold good should the first laying have been hatched and the young but a few days old before being destroyed. I have as yet no actual proof of any species attempting to bring forth a third brood should two broods already have been successfully reared during the season, although with such early and late nesting species as Thrush, Blackbird, Robin,

Sparrow, Stock-Dove, Ring-Dove, Moorhen, and Coot, &c., this seems generally taken for granted. But, to take as an instance the nesting of the Common Sparrow, I might add the conclusions of some careful observations on this species. I have never known them attempt a third brood, should the first two have been successful in leaving the nest, but if the first clutch be taken then two broods would still be reared, or as many as four clutches laid before a brood is reared, and after this no further laying attempted. The following are the only species nesting in the above-named county that to my knowledge ever attempt the rearing of a double brood, and I include several that rarely do so, and others that I am not as yet fully satisfied upon:—Mistle-Thrush, Thrush, Blackbird, Hedge-Sparrow, Robin, Stonechat, Pied Wagtail, Meadow-Pipit, Sky-Lark, Reed-Bunting, Yellowhammer, Common Sparrow, Tree-Sparrow, Greenfinch, Linnet, Starling, Wren, Swallow, House-Martin, Sand-Martin, Kingfisher, Ring-Dove, Stock-Dove, Moorhen, Coot, Grebe.—J. STEELE-ELLIOTT (Dowles Manor, Shropshire).

A Query.—Some one of your correspondents might perhaps give us some account of the herd of Wild Red Deer, said to number some *five hundred* head, which occupy the fells to the north-east of Ullswater, of which I have received a bare statement lately. I do not fancy the fact is one in common knowledge amongst British naturalists. I would also like to know what population of *Dotterels* is to be found (1905) in the north-west of England.—J. A. HARVIE-BROWN (Dunipace, Larbert, Stirlingshire, N.B.).

THE ZOOLOGICAL SOCIETY'S GARDENS.

SEVERAL interesting additions to the Zoological Gardens were made during September. First and foremost must be mentioned a fine young male Orang-utan from Sumatra, presented by Mr. H. N. Ridley, who had kept the animal for seven years in the Botanical Gardens at Singapore. It is probably, therefore, not less than eight years old. Mr. Ridley also sent an adult male hybrid between the Pig-tailed and the Common Macaque. In size and general appearance this fine Monkey favours his pig-tailed parent. In the matter of the tail, however, Nature has effected a compromise. In length it is like that of a Common Macaque, but in direction of growth the so-called pig-tailed curvature is evident, the result being an organ resembling very

much that of a Baboon. With the approach of winter owners of Monkeys begin to feel alarmed about the health of their pets during the coming cold weather, with the result that considerable numbers are offered to the Society. The most interesting of the specimens presented for this and other reasons are an example of the Abyssinian Guenon (*Cercopithecus aethiops*), from Khartoum, and two Red-rumped Guenons (*C. pygerythrus*), from the Shiré River, their scientific value consisting in the fact that the localities are known; but the most valuable of all the Monkeys are five Talapoin Guenons (*C. talapoin*), from Utanghi, in the Upper Congo, deposited by Mr. Rothschild. This rare species has not been exhibited in the Gardens for many years.

To the Carnivora have been added a three-banded Palm Civet (*Arctogalidia trivirgata*) and a Binturong (*Arctictis binturong*), both presented by Mr. H. N. Ridley. The Binturong is a valuable accession. So also is a Cat, alleged to have come from Calcutta, which proves, however, to be a variety of the South American Jaquarondi, a species rarely exhibited in the Gardens.

The breeding of Birds is now practically over, but the hatching of four Andaman Teals is worth putting on record as being probably the first time this species has been bred in captivity. Our stock of Pheasants has been increased by the purchase of two hen Sæmmerings, one hen Japanese, one cock Siamese, and a cock and two hens Elliot's. Time was when the latter was a fairly common species in captivity; recently, however, it has become scarce and valuable, and fetches the high price its beauty deserves. If we are successful in breeding this bird next summer the young will repay many times over the money expended on the parents. Our fine series of Macaws, including the Hyacinthine, Glaucous, Military, Red and Yellow, and Blue and Yellow, has been enriched by the presentation, by Mr. McBarnett, of a fine Red and Blue (*Ara macao*); and a large but immature female White-tailed Sea-Eagle, presented by the Duke of Orleans, makes a pair with the male of that species the Society already possessed.

A considerable number of Reptiles have come in, mostly deposited by Mr. Rothschild; but the Society is indebted to Mr. E. E. Green for an example of the rare and quaint Ceylonese Knob-nosed Lizard (*Lyricephalus scutatus*). It is also satisfactory to record the birth of five Southern Anacondas (*Eunectes notaeus*), a rare species which has certainly never previously bred in any European zoological garden.

NOTICES OF NEW BOOKS.

Travels of a Naturalist in Northern Europe. By J. A. HARVIE-BROWN, F.R.S.E., &c. T. Fisher Unwin.

THESE volumes in part constitute a welcome echo of a notable expedition long since described by Seebohm, and contain the notes written at the time by the other member, and apparently actual promoter, of the journey. The narrative of Seebohm is now supplemented by the original journal of Harvie-Brown, and, if the general reader will be more attracted by the first, the practical ornithologist will revel in the facts and details which are fully recorded in these two volumes, and which will prove invaluable to those who may contemplate covering the same ground, if they do not, as we think they will, incite others to visit and collect in those desolate regions.* These daily records will provide future travellers with a knowledge of what to expect, and how best to realize these expectations; they also inspire dreams of further ornithological conquests. The discoveries made during the expedition are so well known to ornithologists as to render their repetition unnecessary, at least in this notice; but Mr. Harvie-Brown's notes contain much that is more than simply interesting, particularly as relates to the perching habits of birds in the region of the Petchora, which do not perch, or but seldom do so, in other countries. This aptitude is regarded by the author as "undoubtedly forced upon the birds by the great flooding of the country, and what was originally forced upon them has become a favourite habit."

The volumes also contain an account of two northern trips made in the company of the late E. R. Alston, a naturalist who now a quarter of a century ago left us all too soon. These journeys to Norway and Archangel, apart from their own reward, incited the idea of "*Eastward still*," which resulted

* In the 'Geelong Naturalist' (2), ii. p. 75 (1905) appears an account of 'A Trip through Northern Siberia,' by R. E. Trebilcock, who was accompanied by Robert Hall, the well-known Australian ornithologist.

in some of the ornithological secrets of Siberia in Europe being unravelled.

The portraits given are the strength of the illustrations; it is pleasant to see the features of colleagues with whom one is unacquainted, and of whom we may have formed an erroneous impression. There is often much friction among naturalists, and much of it might be avoided or reduced by a little personal knowledge or acquaintance.

Genera Avium. Edited by P. WYTSMAN. Parts 1-5. Brussels: Verteneuil & Desmet.

THIS work, which is to be published entirely in the English language, has secured the co-operation of P. L. Sclater, R. B. Sharpe, W. R. Ogilvie-Grant, E. Hartert, E. Hellmayr, T. Salvadori, and other ornithologists, and promises to be a work of considerable importance. Five parts have reached us, each with a coloured plate, and following the plan of the publication, *viz.*, each family to appear separately with separate pagination, and the history of its classification to be given with synoptical tables of the genera (or subfamilies); a description of each genus, and a list of species, subspecies, and varieties, with bibliographical references and details of geographical distribution. The drawings are made by M. Keulemans, and no effort to obtain accuracy and to bring up the work to date has been spared.

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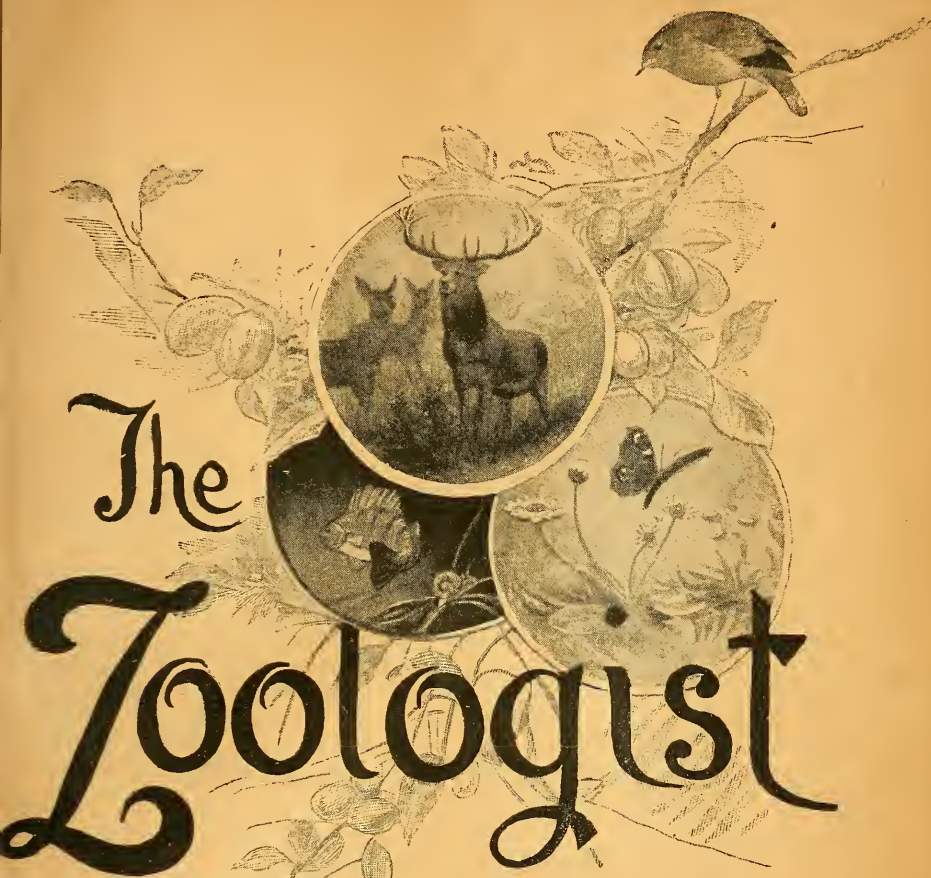
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THE ZOOLOGIST

No. 774.—December, 1905.

SOME FISH-NOTES FROM GREAT YARMOUTH FOR 1905.

BY A. H. PATTERSON.

THE fish entries in my 1905 "note-book" are not of that varied and interesting a character which I could have wished; I have this year to regret more a scarcity of curious or strange fish taken by our local shrimpers than a want of interest on their part. Those queer examples which have been obtained came to hand more for the sake of the inducements held out than from motives of curiosity.

In March-end four examples of the Ballan Wrasse (*Labrus maculatus*), of the green variety, were taken off Yarmouth, each about the size of one's hand; and a most beautiful specimen, 11 in. in length, of a decided venetian-red colour, was procured for me by Mr. Robert Beazor, a Yarmouth fish-salesman, from a "wolder" fishing out of this port.

On April 25th I happened to be passing an obscure little fish-shop, when I observed a pile of fish just shot out of a "trunk." Amongst them I counted nearly a score of Streaked Gurnards (*Trigla lineata*), quite a number of Sea-Bream (*Pagellus centro-dontus*), and some vividly coloured Red Gurnards (*Trigla cuculus*). There was also a small Cuckoo Ray (*Raia miraletus*). These fish had been caught by a Newlyn boat, had been despatched to Lowestoft, and sold to a Yarmouth fish-dealer—in so roundabout

a fashion has this erstwhile prosperous trawling port now to obtain enough deep-sea fishes for its inhabitants. In a public-house hard by I saw a dried specimen of the Armed Gurnard (*Peristethus cataphractum*). I could get no satisfactory evidence as to whence this Mediterranean species came, but in all probability it had been taken off the Cornish coast.

Saw a Lemon Sole (*Solea lascaris*), 10 in. in length, on a fish-slab on May 2nd, and a Flounder weighing 1 lb. 4 oz. near to it.

Several fishes showing marked deformities have come to hand during the year. A peculiarly stunted Sapphirine Gurnard or Tub-fish (*Trigla hirundo*) was brought me by a fish-hawker on May 22nd; of a total length of 11 in., the head measured $3\frac{1}{2}$ in. I obtained a 13-inch Haddock very much humped, with a couple of "rounds" on its back, that gave it a very Camel-like contour. The vertebræ had in two places coalesced, forming a couple of knots the size of acorns. An 11-inch Codling, with a curious bend at the posterior end, was taken off one of the piers on Oct. 14th, and still another about a week after.

Several Twait Shads (*Clupea finta*) about the size of a Herring have been taken with the Herrings in the drift-nets during the present fishing; and I have reason to believe that a very fine Salmon met with a like fate. I found the head of one washed up on the beach in a particular locality that favours this supposition.

An exceedingly large Fishing Frog or Angler (*Lophius piscatorius*) was brought in by a shrimper on May 25th. Observing a group of men gathered around some object on the quay side, I joined them. They ventured some marvellous opinions upon the unwieldy thing, and, knowing my "propensities," expected me to add to the discussion, which I did. I asked the shrimper to overhaul the fish's "pockets." "Someone's been over 'em a'ready!" said he; "but theer worn't nothin' in." I have known five Soles to be turned out from the strange pouches the Angler carries. The men did not know what to do with the soft flabby monster, which weighed a good half-hundredweight. My suggestion that they should eat it met with some doubtful shrugs of the shoulders. Local shrimpers would as lief eat donkey-meat as experiment on a strange fish.

An Eel-catcher, who had netted a number of Eels in a ditch on the Breydon marshes, sent me, on May 28th, what he considered to be the ovary of a large example he had taken. It was, however, only the stomach of the fish, crammed with eggs of the Three-spined Stickleback that had been most industriously collected by the unfortunate fish.

A fish answering to Willoughby's Red Mullet (*Mullus barbatus*) was exposed for sale with a number of the Surmullet on June 6th. They had been sent from the west coast. I have never yet met with a locally captured example.

On June 8th I had a small Rose Perch (*Scorpena dactyloptera*), 7½ in. in length, brought me by a shrimper; and on July 4th a hybrid Turbot-Brill, about three pounds in weight, came to my notice.

I regret that "draw-netting" (seine-netting) has here become yearly less pursued; a few men in the finer months occasionally do a little of it, but no purposeful following of it obtains. The catches having proved so unremunerative seems to be the cause of this. I saw a draw-net hauled in on July 22nd by some beachmen and sportive visitors. The "catch" was of small account, only a few edible species being taken. I enumerated the following species:—Fifteen-spined Stickleback, Yellow Goby, Atherine, Greater Sand-launce, Smelt, Eel, Pollack, Flounder, Skate, Herring, Five-bearded Rockling, Viviparous Blenny. They were mostly very immature examples.

A strange fatality overtook thousands of Eels, many of them very fine ones, during the exceedingly hot weather that prevailed in the latter half of July. Their decaying corpses bestrewed the river sides, and became entangled among the Broad-side reeds, presenting a most unsightly exhibition. Various causes were assigned—the pollution of the rivers by sewage matter, and the influx of carbolic acid from the drains; but these agents would not have been responsible for the mischief done in the Broads. I think the abnormally heated mud and consequent excessive decay and quick decomposition of aquatic vegetation had not a little to do with the "turning up" of these most sensitive fish. The Eel-catching on Breydon, and in the neighbourhood generally, has been a very poor one for the local fraternity.

The most remarkable "sport" I have yet obtained was a

hybrid Holibut-Plaice, which I met with when casually passing a fish-shop. The unusual bluish-ash colour of the fish, spotted with the familiar orange dots, at once arrested my attention on Aug. 17th. "How much?" I asked the vendor, taking it up from the slab. "Thrippence!" said he, laconically. "It's mine," I replied, as the fellow packed up the specimen in a newspaper, with the remark of its being "a rummy kind of a fish!"

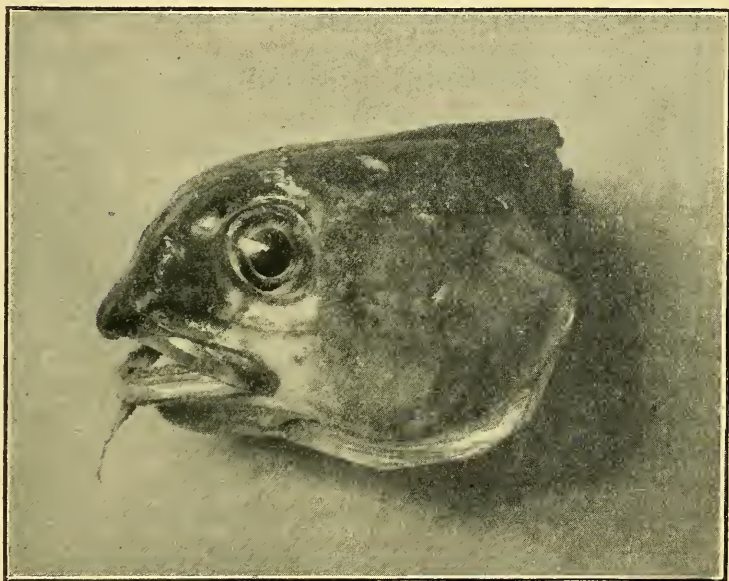
The fish was 16 in. in length, very like a Holibut in the shape of its head, and a Plaice in the body. The eyes were straw-coloured, and the under side of the fins surrounding the fish were peculiarly sprinkled with white, as if a brush of whitening had been carelessly passed along them. The texture of the skin below was very like that of a Holibut.

Some time during the last week in October a small three-stone example of the Sunfish (*Orthogoriscus mola*), which had become entangled in a Scotchman's herring-nets, was brought to the wharf, where it caused much comment and considerable speculation as to its name, habits, &c. I heard about it the same day it was taken, but had no chance of seeing it, for it was snapped up by a fish-dealer for four shillings, and promptly despatched to London with other fish, possibly just to exhibit on a fish-slab as a "draw" or novelty. I heard that it brought the original purchaser a dozen shillings profit. Probably by this time it has gone the way of the rubbish-box, and been forgotten. It does seem a great pity that rarities amongst fish merely gratify a passing interest, and "the incident closes"; whilst a rare bird, less interesting from a naturalist's point of view, and comparatively much commoner, arouses competition for its possession, and sets one section of the scientific—or, at least, the collectors'—world in commotion.

I have reason to think that the interest I have shown, and to a certain extent "worked up" among the local fish fraternity, has borne fruit, for as soon as I made my appearance on the wharf, after a week's interval, quite a number of fish-people surrounded me, and sought my opinion, one man taking me to a rough pencil-drawing scrawled on one of the fish-merchant's office-boards, and a bit of humorous and dialectic argument followed; but everyone was satisfied when I gave them a correct

“lightning” sketch on a leaf of my pocket-book, wherein the Sun-fish’s huge dorsal and anal fins were placed astern of it, and the odd little “button-hole” of a mouth depicted at the other end. My drawing and extempore “lecture” left them all knowing something of the beast, and good-humouredly satisfied. By such means has one to arouse a bit of interest in the hope of future favours.

Early in November a purely white Thornback Ray was landed at Lowestoft in a trunk with other “offal.” I did not manage



“BULL-DOG” CODLING.

to secure it, as it was purchased by a fish-dealer and despatched inland. Two or three of my fisher-friends saw it, but were too late to secure it.

On Nov. 24th a codling belonging to that queer variety known as “Bull-dog” fish—so named from the deformity of its head—was caught on a line off the Britannia Pier by Mr. E. Boning, of this town. I have rarely met with similar malformations in the Cod, Haddock, and once in the Sapphirine Gurnard.*

* Cf. ‘Zoologist,’ 1897, pp. 275-6 (figure).

Notwithstanding the greater pollution of our local rivers and Breydon by sewage and other noxious matter, it is a fact that Smelts still ascend to the fresher waters, and on the "flats" afford local smelters with occasional good catches. I was looking on at three of them "drawing" on Nov. 8th. Amongst their catches they were—and so was I—astonished at seeing a goodly-sized Scad (*Trachurus trachurus*) kicking about. This I secured for a friend who is interested in plaster-casting local fishes. It is the first taken on Breydon of which I have any record. The same men took several Sprats, also most unusual there, although plentiful in November off the Suffolk coast.

A Twaite Shad, $14\frac{1}{2}$ in. in length, was taken on Nov. 18th in the nets of a Scotchman; how this Chub-headed fellow managed to gill itself in so small a mesh, and remain there, is one of those problems that wait solution.

The Herring fishery this season has produced little of interest from a naturalist's standpoint; the Herrings have been of excellent quality, and a fairly good catch has been made. But those rapacious fishes, *e.g.* Sharks, Dogfishes, and larger enemies in the shape of Porpoises and Dolphins, have been conspicuously absent, only two or three Porpoises having been landed. The plague of Dogfishes which has proved so disastrous on our southern coasts this autumn would seem not to have affected in the least the interests of our local fishermen.

NOTES ON THE ORNITHOLOGY OF OXFORDSHIRE,
1903.

BY O. V. APLIN, F.L.S.

(Concluded from p. 417.)

April 20th.—Men saw ten Wild Geese, going E., fly over the village about 9 a.m. Magpie's nest of three eggs. I have known the eggs very hard sat by the 21st. A Swallow near Trafford Bridge. When I got home from Otter-hunting I found one sitting outside the barn-loft door; I opened it, and the bird went in at once, and remained there. Swallows always breed there, and I have no doubt it was one of our own birds.

22nd.—Three Gulls at Wickham, flying east.

23rd.—Hounds killed an Otter on the Evenlode near Puddicote. Saw three House-Martins (early), Ray's Wagtail, Tree-Pipit, and a Wood-Wren travelling along a railway hedge near Charlbury. The Evenlode valley is earlier for migrants than we are here. Cold day and slight snow shower.

25th.—Very few migrants here. News of nests of seven and four eggs of the Coot and of one egg of Little Grebe seen near Eynsham yesterday.

26th.—A pair of Stonechats in Milcombe gorse; I have not seen one in this old haunt of the bird for a long time.

27th.—Redstart and Ray's Wagtail. Long-tailed Tit's nest with eleven eggs.

28th.—Blackcap.

29th.—Driving Mr. Whitaker down to Ettington, we saw a male Brambling near Alkerton, a very late date for it to be here. We noticed Sand-Martins at a breeding place, but could see no hedge-warblers except *Phylloscopi* until we got into Warwickshire and down Edge Hill, where were several Nightingales, and we heard the Cuckoo at Ettington.

Rainfall 1.96 in. on nine days this month.

May 1st.—Cuckoo here.

2nd.—Lesser Whitethroat common and noisy. Kestrel had four eggs at “Rignall.” The Sparrow-Hawk bred in 1902 in a small belt of spruces between here and Barford, and the year before in the spinney by the brook here, so low down that the nest could be touched by any one standing on the ground. With every one’s hand against it this bird is becoming very uncommon.

4th.—Floods everywhere. Garden-Warbler and Whitethroat.

5th.—News of a Bittern shot near Eynsham last winter.

6th.—Country—uplands and all—very wet; great floods all down the Cherwell valley; very stormy weather.

7th.—Violent hailstorm between here and Banbury, but did not reach us; it cut the leaves off the trees, and hail like this must surely kill some small birds. Floods very big. The Long-tailed Tit, like some other resident species, seems unusually abundant this year. A friend told me he had found no fewer than five nests just round his house, South Newington Hill, and added that he had hardly ever seen more than one in any year previously.

8th.—Shot a few young Rooks. They are rather early, and there were some strong flyers. One with a white chin and the distal half of the lower mandible white. A Wryneck has been about the Paddock-walk for a week. No rain all day; the 24th ult. was the last fine day.

9th.—There are three if not four Wrynecks about the village—an unprecedented circumstance, for the Wryneck is almost a rarity here now. Torrents of rain again, and the lower part of the village flooded.

12th.—The last two days cold and wet. This morning almost a frost, and we gladly left home for a month.

Rainfall, 5.05 in. fell in seventeen days. A dry warm May is always desired here!

June 14th.—I can only see one Swallow about these premises. It is reported that 2.9 in. of rain fell at Oxford to-day.

16th.—Floods. The pastures “squelch” as you walk, with muddy water; the furrows are full of water, the brooks brimming, and the low meadows flooded. Maximum temperature sometimes below 50°.

19th.—In a fine interval I examined the Sand-Martin colony

at Tadmarton. The nests, chiefly lined with large (often white) feathers of the domestic hen, contained incubated eggs or young. The old man (Ed. Preedy), who has worked many years in the pit, and takes an interest in the birds, says they come there the end of April, but not all at once, and some stay until the end of September, but most of them go earlier.

20th.—Mr. Warriner, of The Grove, writes : “ The floods are coming out in the hay-meadows for the fifth time this summer.”

25th.—Ray’s Wagtail young on wing ; they call like the old birds, and their stumpy tails wag quickly.

26th.—Warm weather at last. Natterer’s Bat flew in at a window.

28th.—A pair of Red-backed Shrikes have bred this year in the old locality, “ Milton lane close.”

29th.—I went to Bampton, but found the towing-path of the Isis impassable, as water was running over it in places. A very strong stream running. The country in this low-lying district was in a deplorable condition. Many fields were still covered with water, others with slime left by the floods, and then baked by the sun into a dirty white crust. These fields (all hay-grass) cannot, of course, be mown, and will probably be ruined for years. The biggest flood was caused by the great three days’ rain between the 13th and 16th inst. There were seas of hay-grass along the river, all of which ought to have been cut, and much of which was hopelessly damaged. The luxuriant herbage on and inside the raised banks of the river was all covered with slime, and all nests must have been destroyed. It is a great breeding-place of Reed-Buntings, and many Moorhens and Dabchicks nest among the rushes in the river ; but I saw few other birds. The hedges and ditches on each side the raised road between Bampton and Tadpole Bridge were very lush, and seemed full of Sedge-Warblers and other small birds. Larks were numerous in the fields there, and came to dust themselves on the raised marsh road. The land is so flat there that a great extent of ground had been flooded ; and the driver of the omnibus which runs between Bampton station and village told me that the water on the road was up to his horse’s collar, and it was dangerous to get about the country for a day or two. I spent a delightful time watching an adult Black Tern feeding over the river. Time after

time it worked slowly up a reach of the river against the wind, flying quite low, and then, getting up into the air, it dropped back on the wind to work up again. Several times it dipped in the water with its beak, but I could not see that it took fish; from the quick turns and twists it made in the air I thought it was catching insects. Sometimes it hovered, and one weedy bit of river it always passed over very slowly, and only a few inches above the surface, beating its wings a good deal, and making little darts at something. Its turns and twists were executed with great quickness, and it was quicker on the wing and extended its wings more than the marine Terns. There were many Swifts around it, but it did not suffer much in comparison of wing-power, though of course not so fast. Swallows mobbed it. When all this district was marsh—not so very long ago—it is very probable that the Black Tern was a breeding species, and that the birds which so often come up the Thames in spring are revisiting an old haunt. I saw a flock of quite a hundred Peewits, but only two or three mobbing birds; possibly some of the late young were drowned. Practically all the eggs, and the young which could not fly, of the ground-building birds must have been destroyed over a large extent of country—for miles, indeed, in various directions from Oxford. I heard one Corn-Crake, and saw several Herons, all flying towards Clanfield, where there is, or was, a small heronry. Mr. Darbey had a female Hobby, trapped at Sandford Brake on the 9th; the male escaped.

30th.—Saw and heard a Reed-Warbler in South Newington osiers. It is very uncommon in this part of the county.

Rain to the amount of 3·85 in. fell on nine days this month.

July 1st.—Mr. W. W. Fowler told me that the Barred Woodpecker had bred this year in an old dead stump in the Botanic Garden, Oxford. He had seen the young being fed.

4th.—Cuckoos very scarce this summer. I have heard none since the latter end of June. News of a nest of young Pied Woodpeckers nearly ready to fly in Wychwood Forest.

10th.—Goldfinch building in apple-tree; probably a second nest.

11th.—Curiously enough, House-Martins are more numerous than usual.

17th.—A Turtle-Dove's nest with two fresh eggs had a distinct lining of clover-stems.

18th.—Torrents of rain, the outskirts of a thunderstorm, broke up the spell of fine weather which has lasted with hardly any fall since June 21st. Thereafter the rest of the year was terribly wet.

19th.—Pair of Barred Woodpeckers very noisy about the garden, and I think have young in a big walnut tree just the other side my wall.

20th.—Preedy brought two hard-sat clutches of Sand-Martins' eggs he had uncovered when getting sand. Less than a year afterwards he was killed by a fall of sand and earth in the pit.

22nd.—There fell at Bloxham Grove, 18th–21st, 2·91 inches of rain.

29th.—Numbers of Garden and other Warblers in the kitchen garden now.

31st.—At Langley Mr. Calvert showed me a Linnet's nest built in the side of a straw-rick three feet from the ground. The nest was nearly all wool, but on the open side there was an out-work of clover-stems. It contained four eggs. Linnets are abundant in the high-lying country round there (formerly part of Wychwood Forest), but breeding accommodation is rather limited, for stone walls almost entirely take the place of hedges. I may mention here that when shooting at Langley early in October, we found in a potato-field an old Linnet's nest built in the middle of a potato-plant on the top of the ridge. Just now Linnets are destructive to kale-seed now being harvested, and we saw flocks among the plants. In the early morning Corn-Buntings were dusting with the Larks on the road.

Rainfall 5·11 in. on fifteen days.

August 2nd.—Starlings are singing again in the morning.

8th.—Corn-Bunting singing. A few apricots ripe. Birds very destructive to fruit, notwithstanding the wet season.

11th.—When Otter-hunting on the Cherwell saw a Green Sandpiper at Twyford Bridge.

12th.—Still much hay out and some fields uncut.

13th.—Found an Otter on the Evenlode between Handborough and Charlbury, but lost it. A big flock of Peewits on the high ground near Langley.

14th.—Charlbury. Very heavy rain in forenoon. A strong drag above Bruern Abbey, and put down three Otters near Bledington Mill, of which we killed a bitch of 16 lb. or 17 lb., and a dog of 21 lb. or 22 lb. Some Swifts still here.

16th.—Sparrows eating apricots on a wall tree as fast as they ripen.

19th.—Greenfinch and Goldfinch sing well; the latter still nesting.

20th.—A Swift went into a hole under the eaves of a thatched cottage and stayed there.

21st.—Some Swifts. Of the Swallow tribe (now much in evidence in the evenings) about this evening, four-fifths were Martins. I think nearly three-fourths of the Swallows perished in the spring. Song-Thrush sang, full and well. Goldfinches sing all about.

22nd.—Some Swifts. The features of this wet summer are the general scarcity of summer migrants, especially Cuckoos and Nightingales; the great scarcity of Swallows and the comparative abundance of Martins; and the irregularity in nesting and in the period of song.

23rd.—Our few peaches are being eaten, unripe, by snails and birds, and apricots have to be gathered unripe for the same reason. Snails and slugs, which swarm, have eaten up all my young lettuce and cruciferous plants. I have done some good by turning young Ducks into the kitchen garden; but why are the resident birds—so numerous—apparently almost useless?

24th.—Torrents of rain. Seven Swifts together.

25th.—Only 52° at 9.30 a.m. Swifts still screaming over the garden.

28th.—A Kestrel turning over old horse-droppings.

29th.—Wheat and oat harvest now very general, the corn having ripened fast the last few days. A good many Swifts. Mr. Warriner tells me he put up three Snipe on the 22nd in what is usually a dry meadow, but now fast becoming a swamp. Also that early in the month he saw fifty or sixty Duck settle in flooded hay-grass near the mouth of the Sorbrook.

30th.—Chiffchaff in song.

31st.—Stonechats have bred this year in Milcombe gorse; I saw both young and old to-day.

Rainfall 3.51 in. on fifteen days.

September 1st.—Partridge-shooting did not open to-day, the harvest not being far enough advanced. Swifts here, and screaming, high up, at evening.

2nd.—Some Swifts ; their late stay is remarkable.

4th.—Several Whimbrel heard passing at night ; a still cloudy night, moon big.

7th.—When on the high ground near Tadmarton Heath I saw an adult Herring-Gull, which flew past rather low down against the fresh W.S.W. breeze.

8th.—Evidently a very bad Partridge year ; on a very small beat which has yielded ere this eight or nine brace in a day, we saw to-day only three old birds. Probably most of the birds deserted their nests in the terrible spell of wet cold weather, June 13th–16th, and it is probable that many old ones died.

10th.—A destructive gale at night from S.W., and three-quarters of an inch of rain.

11th.—A great many Mistle-Thrushes on Bloxham Grove—a flock of about thirty in some potatoes.

15th.—An unusual number of Mistle-Thrushes in the fields.

16th.—Only 45° at 9.30 a.m.

17th.—Flocks of Meadow-Pipits, and many Mistle-Thrushes.

23rd.—Owls very noisy at night lately. Besides the numerous Brown Owls, I hear occasionally the Barn-Owl, which seems more common this year than it has been lately.

24th.—Chiffchaff has sung for some days. I do not think any Swallows and Martins have gone yet, but the congregations on the roof on one or two mornings lately have been very small compared with those in some years.

25th.—Sixteen Partridges killed at Milcombe comprised eleven old and five poor young birds. We got two Land-Rails in tall weedy Dutch clover on high ground ; this is late. Five were killed near Hook Norton on the 9th, and some were seen at Milcombe when barley was cut. All these must be *passing* migrants. Some Pipits to-day. The fresh skin of a young Dotterel was brought to me by a friend, who shot it on the 22nd as it flew over his head in a turnip-field at Sibford ; this is the only local Dotterel I ever handled. Seven and five Snipe have been shot near the mouth of the Sorbrook, and Mr. E. Colegrave saw one as early as the end of July.

26th.—Chiffchaff still singing in garden.

28th.—The wet and cold notwithstanding, we have had a few butterflies; three Red Admirals close together in the garden to-day, and a few all the month; a Peacock on 25th; and one Painted Lady before the cold pinch.

Rainfall 2·07 in. on eleven days.

October 1st.—Many Song-Thrushes in turnip-fields. Flocks of Linnets in thin weedy swedes, and some Meadow-Pipits.

5th.—Torrents of rain and very stormy early; the country very wet. Meadow-Pipits swarming in turnip-fields, and some roosting in grass. Many Song-Thrushes in hedges and turnips. Hardly any reduction yet in the numbers of Swallows and Martins. Larks singing all about, as also on the 1st.

6th.—Another storm. Much barley, cut and uncut, out. One of the fine old walnut-trees at Milcombe is much decayed, and in it Mr. E. Colegrave has found the following nests at one time, *viz.* House-Sparrow, Tree-Creeper, Flycatcher, Starling, Stock-Dove, and Great and Blue Tits. In other years there have been nests of the Jackdaw and Redstart. Two fine old plane-trees on the banks of the Swere at Barford used to hold a small rookery, and were frequented in the breeding season by Starlings, Jackdaws, Tree-Sparrows, and the Barn-Owl, which I have seen emerge from one of the larger hollows.

7th.—Mistle-Thrush sang a little.

9th.—At Langley, on the high ground, many Pipits in turnips and kale, and a good many Thrushes; flocks of Linnets. A Stonechat on a wire-fence; they do not breed there. Mr. Calvert told me he saw eight Quail on Sept. 8th, and shot one; the rest went into standing corn; he heard one calling in the spring. On the 2nd inst. he shot a Land-Rail, and saw another in long benty grass the next day. About the end of last month he saw a Curlew fly over. Mr. Fowler writes from Kingham on the 9th, "Still young Martins in the nest over my bedroom window." The Evenlode valley partly flooded, and rushes growing in the meadows.

11th.—Torrents of rain, and low part of village flooded again.

13th.—To Hook Norton to see a Shag which was seen to alight on a mill-pond near there on the 8th, and was caught alive. A good many Martins here, and some Swallows here

and at Hook Norton. Wheat still out, and lots of barley and oats.

17th.—Grey Wagtail in ditch at Milton.

19th.—Red-legged Partridges are even more scarce than our own birds. The country is terribly wet, and the gateways surrounded with mud and water. Some barley not cut, and this and oats rotting on the ground. A Fieldfare flew over, and three others settled in a stubble-field.

20th.—Two Martins over the village.

22nd.—A flock of Crossbills reported as seen in the larch spinney near Tadmarton Heath yesterday. I went up to-day and the next day, but could not find them. A fine red male was sent to me from over the Warwickshire borders. A Long-eared Owl was trapped in this spinney in the summer, and liberated. It is very rare as a breeding species in this part of the county.

23rd.—Came suddenly on a female Sparrow-Hawk on a gate near Lower Tadmarton.

24th.—A pair of House-Martins hawking near the railway-station all the afternoon. Goldfinches singing.

25th.—Very stormy; wind, rain, and lightning.

26th.—Stormy and heavy rain. Only one Martin about.

27th.—Torrents of rain.

28th.—In the twenty-four hours ending at 9 a.m. this morning, 1.6 in. of rain fell. The little valley through the village is a river! The Sorbrook valley is a series of lakes from Wickham to Adderbury. Found the remains of a Stock-Dove just outside an oak spinney on Bloxham Grove, which appeared to have been killed and partly eaten by a Peregrine.

29th.—Very big flood in the Cherwell valley.

31st.—The wettest October I remember. To Somerton to look at the flooded valley. A team of Duck, one or two Herons, Moorhens, and two small flocks of Peewits, were all the wild-fowl I saw, except an immature Golden-eye busily diving in the deep water of the huge lake now covering Clifton "Moor." Seventeen Fieldfares in one lot. One over the garden this morning. I passed, at Adderbury, part of the scene of the destructive wind-storm of the 25th, which, coming from the direction of Swerford, missed this village almost (passing to the south), and, passing the Grove and Adderbury, extended towards Warkworth. The

width of the storm was very slight, but in its course large trees were rooted up or snapped off, and many had the appearance of having had their tops twisted out of them. It occurred at about 8.30 p.m.

Rainfall 6·21 in. on twenty-six days.

November 1st.—There was practically no frost last month. The garden is full of flowers, including sweet peas and dahlias, and scarlet runner beans are still gathered.

4th.—A female Stonechat catching flies from a hedge in Grove lane.

5th.—Dense fog in forenoon. To Wallingford to see the collection of local birds belonging to Mr. W. Newton, of Crowmarsh Battle. The following information about birds in that part of the county I received from him, partly then, and partly in a letter from him to Mr. H. Noble, kindly lent to me by the latter.

Carrion-Crow.—Still numerous in the Thames valley there.

Hoopoe.—The bird recorded by Clarke-Kennedy as shot at Wallingford about June 18th, 1867, was really killed at Ewelme, Oxon, by Mr. J. P. Franklin.

Buzzard.—Mr. Newton believed that a pair bred in recent years at Swyncombe, as they were about there for some three years in the early eighties, in the late Col. Ruck-Keene's time, who was a great preserver of all Hawks and Owls. [I may add now, that when staying a few days at Watlington, in the spring of 1904, I was assured by the landlord of the ancient and famous Inn where I lodged, that two Buzzards had been hanging about the woods on the hills in the previous winter.]

Kestrel.—He found a nest in a wheat-rick, where the Rooks had pulled out a sheaf or two just under the eaves. A Rook had been killed, and the carcase hung up to keep others away, and the Kestrel was sitting on her eggs within a few inches of the dead Rook.

Osprey.—He saw one fishing in the Thames, and watched it for some time, and saw it plunge right into the water three or four times from a height of forty or fifty feet; it did not, however, catch anything. From Mr. Newton's companion on this occasion I learn that this occurred close to some big elm trees near Benson lock, in the first or second week in September,

1899. On my way back from Wallingford, I called to see Mr. Darbey in Oxford, and *à propos* of this he told me that some years ago (probably twenty, he was then in Market Street) he stuffed an Osprey for Mr. Tyrrel, of Water Eaton, who shot it. It was seen to plunge into the Cherwell, and as it rose it was shot. It did not fall at once, but carried the Roach it had caught with it until it fell. The Roach was preserved with it.

Pallas's Sand Grouse.—Alluding to the fine male and female in his collection, part of the 1888 immigration, Mr. Newton remarked that he first saw a flock on the Sunday, and that on the next day he saw four or five flocks.

Quail.—Not so plentiful as formerly, and the enclosing of the old Common Fields, which did away with the “mere-baulks,” as they were called, had much to do with this falling off in their numbers. They used to breed extensively in the parish of Ewelme, and one afternoon (Sept. 29th) he shot five couple. He was speaking of the old pointer days; there was a very strong scent to Quail.

Bittern.—One was shot there in September, 1856. It rose from a grassy hedge-bank close to one of the guns out Partridge-shooting.

Stone Curlew.—Mr. Newton has found the eggs several times on the Oxfordshire hills some two miles above Crowmarsh, but higher up near Nettlebed they breed extensively, and on English farm he used frequently to see flocks of fifty or sixty together, and only the previous year, in the parish of Ewelme, he saw a flock of quite that size. They “flight” down to lower grounds at dusk, and scream as they fly.

Ring-Ouzel.—Sometimes occurs in autumn.

Brambling.—Vast flocks frequent the beech woods on the hills in autumn, coming down to the lower grounds and farms later in the season.

Cirl-Bunting.—Nested twice on the flat bough of a deodara in a garden in Crowmarsh.

I examined the following birds, among many others, two or three of which I have already mentioned in my ‘Birds of Oxfordshire.’ I can now, however, add some further particulars of these:—

Red-breasted Merganser.—A female shot at Crowmarsh.

Black Tern.—Two (immature) shot on the river from a flock late in the summer. One was seen by Mr. Newton over the Thames in the summer of 1902.

Snow-Bunting.—A very fine adult male in winter dress shot there five and twenty years before. He had seen two or three since.

Dotterel.—Some fine adult local birds procured years ago. They still (in some years) appear on the hills in spring about the second week in May, and again from the middle of August to the early part of September. At the former season about five in a trip, at the latter up to a score or more. Two birds were shot locally early in September, 1902.

Rose-coloured Pastor.—The very fine adult bird shot at Ewelme some forty years ago, mentioned in my book. It was shot while feeding on cherries by a Mr. Greenwood, in whose possession it was for some years, and at whose sale Mr. Newton bought it, with a local white Hare (which he gave away). Mr. Newton gave me independent information relating to a Pastor, shot at Ewelme Park by Mr. H. Saunders on Oct. 20th, 1871, and preserved; recorded by "E. H.," Pyrton, Oxon, in the 'Field' of March 23rd, 1872.

Snipe.—A very fine "Sabine's Snipe," shot in July or August on Harcourt Hill. It is a very big bird, and we both thought it must have weighed fully seven ounces. It is a long bird, and more the shape of a Woodcock than a Snipe.

Hobby.—A pair of adult birds, shot in September.

Dunlin.—Shot at a little pond on Harcourt Hill.

Peregrine Falcon.—A very fine old female, with the upper part of the breast almost unmarked and tinted with salmon-pink. It is a pretty regular autumn visitor to the Thames valley and the slopes of the Chilterns, where they frequent big open fields, and when gorged, or on the watch, sit on the big clods of earth, when their light-coloured breasts make them conspicuous at a distance. When gorged they are fairly tame, and will let you ride moderately close to them. Mr. Newton had seen them knock down Partridges, but they also feed on Wood-Pigeons, of which there are large flocks about there at that season.

Brent Goose.—One, shot on the river. Mr. Newton considered this the commonest Goose on the river, and added that in the Crimean winter a great many visited that locality, as many as nine or ten being killed at one shot; they were in very poor condition.

6th. — Saw a male Sparrow-Hawk near Wroxton. Larks singing well. The season continues very mild, and the garden yielded tender young green peas to-day.

7th.—A white frost.

12th.—Barley still uncut.

28th. — Country very wet; ditches overflowing, and water standing in upland fields. In the valleys there are very big floods. I hear of a flock of about two hundred Wild Geese which passed over early in the month, and another of about fifty, which settled on the south side of the village a few days after.

Rainfall, 1.38 in. on eleven days.

December 1st.—Near Tadmarton, on a wheat-stubble, was the largest flock of Linnets I ever met with; it must have comprised several thousands. Also a large flock of Sky-Larks. Some Meadow-Pipits frequented a field of mustard eaten off by sheep. Cold and frosty weather the last two days.

3rd. — Several Crossbills have been shot recently in this parish. I have had three sent to me from over the Warwickshire borders.

5th. — I spent some time watching the Crossbills which frequent a small spinney, chiefly of larch, on the Grove estate. Six had been shot from the flock, and there were about a dozen there to-day. They were very tame, and lively active birds even this dull foggy morning. When feeding in the tops of the larches they settle on the slender twigs, and either rife the cone there or bite it off, and fly with it to the upper side of a thicker branchlet, when, holding the cone under their feet, they pick it to bits or open the scales. Bits of cone were continually dropping, and whole cones often tumbled down; so much so that attention would by this be called to the presence of the birds on a still day. The ground underneath the trees was littered with rified and whole cones which had been dropped. When biting

off or rifling an ungathered cone, Crossbills often hang head downwards, and in all sorts of positions, and they recover themselves with an upward swing, like a gymnast on a parallel bar. As they work about among the thicker growth of twigs their action is a sort of half-fly, half-leap, but they also climb in a way that suggests a Parrot. Although they feed in silence, when two or three fly to another tree they call to one another with a bright note sounding like "chep" or "chip," and quite peculiar to them. Their flight is fast, strong, and direct, and this foggy morning their strong wings made a noise as they flew. Sociable birds, they often fed within a few inches of one another, and there were five in one tree-top once. Besides feeding on the cones, they seemed to be biting at something on the twigs, perhaps insects of some kind. Two days later, when I went to look for them, they had gone.

10th.—Many Snipe reported from the flooded meadows near the junction of the Sorbrook, Swere, and Cherwell.

11th.—A fine male Stonechat on the hedge of a stubble-field at North Newington. Larks still singing. Saw two fields with the barley still out.

14th.—During a day after the hounds on foot I could not see a single Fieldfare, and have seen no Redwings yet. There are no haws to speak of this year. A good many Linnets about.

16th.—Mistle-Thrush sings well. Violets in flower.

18th.—Mistle- and Song-Thrush sang.

19th.—Many Linnets still frequent Milcombe gorse.

21st.—Winter aconite in full bloom, true to its day.

22nd.—A Woodcock in Milcombe bushes, and a Jack-Snipe and two or three Snipe at South Newington; probably flooded out in the bigger valleys, for they are seldom seen in any numbers up the little Swere valley. About fifty Fieldfares and three huge flocks of Wood-Pigeons, one of from one to two thousand, and the others of about a thousand each. Lark singing. Mistle-Thrush in fine song and plentiful. A fair amount of Song-Thrush music now, but not so much as one might expect from the number of birds still about; possibly some of them are only on migration.

27th.—Slight snow; a mist hangs over the soaked country.

28th.—In the Swere valley, near Wiggington, were fifteen or twenty Snipe in a wisp, and wild ; a few others. Some Red-wings, the only ones seen this season. A huge flock of Pigeons. Bullfinches common.

29th.—Saw a Sparrow-Hawk and a male Peregrine Falcon. Large flocks of Larks on stubbles. One Redwing here.

31st.—Many Pigeons still here. I have seldom seen so many small birds frequenting the stubbles as one sees now. Larks, Starlings, Tree-Sparrows, Greenfinches, and a good many Linnets. The mild wet autumn has kept them here.

Rainfall, 1·50 in. on fourteen days.

Rainfall for the year, 37·77 in. ! From 24 in. to 26 in. is an average fall.

NOTES AND QUERIES.

MAMMALIA.

Remarkable Cats' Feet.—For some years past I have known of certain domestic Cats in Yarmouth remarkable for the unusual number of toes upon their fore feet. From observations I have made, and the particular neighbourhood in which these felines live, I am strongly inclined to believe that they are all more or less related. To



someone's great regret, no doubt, an intelligent young man of my acquaintance secured one of these (its colour shall be nameless), which he informs me *died rather suddenly* soon after; and there is a black specimen, which he believes to be unrelated, which he intended to capture at the same time, but that it gave him the slip, and has never been heard of since. He macerated the fore feet of the Cat that

"died," and has kindly furnished me with a remarkably good photograph of them. In every instance that I know the Cats' hind feet contain the normal number of toes. As will be seen, on the left foot are seven digits, and on the right six.—A. H. PATTERSON (Ibis House, Great Yarmouth).

AVES.

Nesting of the Dipper in Renfrewshire.—I found a nest of the Dipper (*Cinclus aquaticus*) in May of this year, containing four eggs. One of these I accidentally chipped, so I lifted it out with care. Incubation had been going on for about a week. I went off for a holiday, and returned a month later with my camera to photograph the nest. What was my surprise to find two addled eggs (which I took home and blew), and one dead young one. The mother had evidently been disappointed with the result of her labours, and left the whole thing in disgust. As the nest was by the side of a little waterfall built into the grassy bank in a lonely moorland, and could only be reached by walking up the bed of the stream, I do not think the bird would be disturbed.—T. THORNTON MACKETH (The Hall, Caldwell, Renfrewshire).

White Wagtail in Northamptonshire. — When visiting Byfield Reservoir with my brother on July 19th last, I saw on the dry mud left bare by the falling water (the reservoir being nearly empty) an adult female White Wagtail (*Motacilla alba*), and three or four young ones still in the peculiarly delicate grey dress worn by them when they leave the nest. I have little doubt that these White Wagtails had been reared at the reservoir, the nest probably being built in a hole in the rough stonework which protects the banks from being injured by the wash of the water, and had this year been high and dry for months. The old female had, as far as I could see with the glass, no *black* on the top of the head, merely a dusky appearance.—O. V. APLIN (Bloxham, Oxon).

Increase of Goldfinches in Bedfordshire.—I notice (*ante*, p. 431) a note by Mr. Lodge on the increase of the Goldfinch in Middlesex and Herts. In this county (Bedfordshire) this increase is most remarkable. The bird has been scheduled for several years, and for every one that used to be seen there are now a dozen or twenty. Only this week I saw a flock of nearly thirty in the north of the county, and not far from the same place last spring I saw a flock that must have contained nearly fifty. I have also seen it in gardens well in the town; in fact, it breeds every year within the town boundary, in some elms on the path of one of the main roads. Whether it is also the result of the protection

orders, or what? Owls also are distinctly on the increase—at least, the three we have in this immediate neighbourhood—the Barn, Tawny, and Little.—T. PEARSE (Amphill Road, Bedford).

Tree-Sparrows in East Lothian.—The Tree-Sparrow (*Passer montanus*), still a local species in Scotland, though recorded from Berwickshire to Unst, is fairly numerous about several of the East Lothian farms. During winter it wanders to some extent from its headquarters, and has during the non-breeding season been recorded at least thrice from Midlothian. Behind the village of Gullane, on Oct. 21st, I saw a restless flock of Finches, and amongst them I had a good view of a Tree-Sparrow; but I believe that a large proportion of the birds belonged to this species.—R. B. WHITE (7, Charlotte Square, Edinburgh).

Late Stay of the Swift.—Several notices have appeared lately in 'The Zoologist' regarding the late stay of the Swift (*Cypselus apus*) this year (1905), and I may further supplement the observations already recorded by stating that on Sept. 26th—a cold, wet, and disagreeable day—while at Worthing, a Swift flew into the second floor room of one of the Marine Parade houses. The unfortunate laggard "dumped" itself down on the carpet, from which it was totally unable to rise. I picked it up and tossed it out of window, when it dashed off into its element, apparently none the worse for its experience.—E. F. M. ELMS (24, Hugh Street, Eccleston Square, S.W.).

Peregrine Falcon in Surrey.—On Nov. 8th a fine male Peregrine Falcon (*Falco peregrinus*) was shot at Nonsuch Park, Cheam, Surrey, about fourteen miles only from the Royal Exchange. It was brought to me in the flesh, and weighed one pound six ounces. Nonsuch Park is historically interesting, as the palace was built by Henry VIII., and ultimately pulled down by Nell Gwynne, to whom it was given by Charles II. in 1670. The park is still a large open one. On Oct. 15th, 1903, I also saw a Peregrine fly over my house in Sutton, which was being worried by Rooks.—GEORGE W. BRADSHAW (Hill Road, Sutton, Surrey).

P.S.—I find I have omitted to mention that I judge it was a second year's bird, as the feet were *yellow*, though the cere and eyelids were blue. I saw on Nov. 12th about a dozen House-Martins hawking for flies over the River Mole at Leatherhead, Surrey, where I met them this year on April 9th—a good long stay for a migrant.—G. W. B.

How does the Osprey carry its Prey?—In August, 1896, I had the

great pleasure of watching Ospreys fish in the River Kerni, in the north of Finland, and so am able to give some information in answer to the question asked in 'The Zoologist' (*ante*, p. 435). According to my notes made at the time, the fish was carried in a horizontal position, with the head pointing in the direction of flight.—HERBERT C. PLAYNE (Clifton College).

Baillon's Crake (*Porzana bailloni*) in North Wales.—An example of this rare species was caught by a dog in a ditch at Llangwstenin, near Colwyn Bay, on Nov. 6th. It is now in the hands of Hutchings, taxidermist, Aberystwyth, for preservation for the owner, Mr. Flower, Colwyn Bay. It is apparently a male, and measures over seven inches in length. The white outer primary distinctive of the species is well marked. The spot where it was taken is on the borders of Denbigh and Carnarvon, and is in the old bed of the River Conway, which in bygone times entered the sea to the east of the Little Orme's Head, instead of to the west of the Orme's Heads. So far as I can ascertain, Baillon's Crake has not hitherto been recorded in any part of Wales.—H. E. FORREST (Hillside, Bayston Hill, Shrewsbury).

Sandwich Tern (*Sterna cantiaca*) in the Firth of Forth in November.—The Sandwich Tern is a regular summer visitor to the Forth, and attempts to nest periodically on Inchmickery. In autumn old and young are quite common on the northern shore of the Forth from Fifeness to Dalgety, as well as along the southern shores about Gullane and Dalmeny. Usually it departs by the middle of October, but this year I saw one still lingering at Dalmeny on Nov. 4th.—H. DRUMMOND SIMPSON (52, Queen Street, Edinburgh).

Leach's Petrel in Sussex.—A Leach's Petrel (*Oceanodroma leucorhoa*) was picked up dead in the park at Beauport, Battle, Sussex (the seat of Major Sir Archibald Lamb, Bart.), and was sent to me for identification on Nov. 8th. The bird had no doubt been driven inland by the severe gale of the previous week. The species is purely oceanic, the only European breeding-place of note being St. Kilda. Besides about a dozen specimens for this county, mentioned by Mr. William Borrer in his 'Birds of Sussex,' three more are also recorded by Mr. Dawson Rowley as having been obtained near Brighton early in November, 1860 (*cf.* Dresser's 'Birds of Europe,' vol. viii. p. 498).—THOMAS PARKIN (Fairseat, High Wickham, Hastings).

Storm-Petrel at Yarmouth.—Two examples of the Storm-Petrel (*Procellaria pelagica*) have been brought to me during the present fishing season; in both instances they were wearied-out individuals

which had flown aboard fishing luggers. The first was brought me on Oct. 9th; it eagerly devoured portions of a broken Herring milt and roe which I held on my fingers, its head being continually shaken and its vertically held wings upon the flutter. It mostly seized minute portions, but occasionally "dug" and pulled at a milt as a Gull does at a stranded carcass. It died a day or two after. The second bird was equally exhausted, and far shyer, and most difficult to make feed. It persisted in moving around, much after the manner of a large moth, and when it stopped for a rest would sit with its long legs under it, much after the fashion of a Guillemot.—A. H. PATTERSON (Yarmouth).

Rare Birds in Norfolk.—On Sept. 21st, between Wells and Cromer, I flushed a bird which I at first supposed to be a very yellow Titlark. On securing it I found that it was a small Bunting, which proved to be an example of *Emberiza aureola*. The bird has been identified by Dr. Bowdler Sharpe and Mr. Howard Saunders, and was recently exhibited in London. The wind was N.E. The same authorities decided that a dark Stonechat, shot by my brother, G. F. Arnold, near the same place on Sept. 2nd, 1904, wind W.N.W., was a specimen of *Pratincola maura*. Both birds will shortly be presented to the Eastbourne Museum. — E. C. ARNOLD (Blackwater House, Eastbourne College).

A New Notts Bird.—A specimen of the Dusky Thrush (*Turdus dubius*) was shot at Gunthorpe, in this county, by a nursery gardener named Mills. He heard a bird in a willow tree calling a loud "chack, chack," something like a Fieldfare, but more shrill. When the bird flew out he at once saw that it was not a Fieldfare, as it flew more like a Jay. He fired, and killed it with his second barrel. When he picked it up he knew it was a strange bird, and took it to Bore, taxidermist, of Notts, where I saw it. There is no doubt that it is a Dusky Thrush, and is in very perfect plumage, and not only the first Notts specimen, but a new one to the British list. The bird was shot on Oct. 13th last, and was a male. — J. WHITAKER (Rainworth Lodge, Notts).

Rare Birds in Aberdeenshire.—A specimen of the Great Snipe (*Gallinago major*) was shot near the mouth of the River Ythan, Sept. 5th. It was so much injured by the shot that the sex could not be determined. Roller (*Coracias garrulus*): a female specimen of this straggler was shot at Auchmeden, near Aberdour, Sept. 9th. Its stomach was well filled with beetles and flies. Black-tailed Godwit (*Limosa lapponica*): A fine specimen of this by no means common

species with us, was obtained at the Ythan estuary, Sept. 12th.—
GEORGE SIM (Aberdeen).

Ornithological Notes from North Devon.—Perhaps it is not every-one's good fortune to see over half a dozen Ravens in an afternoon's ramble; yet in walking, last May, in the neighbourhood of Lee, I observed at least eight. Another I picked up dead, and on arriving at Ilfracombe I noticed still another on the Capstone Hill. Some weeks before I spent a very pleasant day at Baggy Point, where I was lucky enough to catch a young Raven, which had apparently only just flown from its nest. A high wind was blowing, and the youngster could only fly very short distances; consequently I soon captured him. He proved to be a most amusing bird. At first he was very angry with me, and snapped at my fingers, but he did no serious injury, although I was surprised at the power which he possessed in his beak. After a while I put him into my spacious inside pocket, and so carried him with me for the remainder of the day. On being first introduced to his new apartments he became very excited, and his muffled croaks sounded most sepulchral. By lunch-time he had quieted down, so I allowed him some fresh air, and a little meat from my sandwiches. The latter he greedily swallowed, but one particularly large piece stuck in his gullet, and it was with the greatest difficulty that he eventually removed it. Like a spoilt child he refused every consolation, and stood a few feet away, staring at me reproachfully with a cold blue eye—"quoth the Raven, 'Nevermore.'" Certainly it is a step beyond the truth to say he did repeat that famous retort, of which an unearthly ancestor of his is represented as having once made use, yet he clearly meant it; for he defied all attempts at recapture, and when I left him he was seated on a wall, the wind ruffling his glossy feathers, and the rain beating across him in cold cutting sheets. I almost thought of tempting him into submission again by offering my muffler (!), but on second thoughts refrained, allowing my friend to battle with the elements as best he could.

Rooks and Starlings are very sagacious birds. I have often watched them hovering over the River Taw, and picking up any dainty morsels that happen to be floating by. One bird, however—a young Starling—met with a fatal accident in performing this clever little trick; his strength seemed to suddenly fail him, he fell into the water, and was carried away by the current. I finally saw him disappear beneath the surface. Starlings have long been known to catch flies on the wing, but last September I saw twenty or thirty Black-headed Gulls swooping over a large field, evidently flycatching. They were accompanied by

four Starlings, who were feeding in the same way. The birds were at too great a height to discern what the insects were. These manœuvres lasted for nearly fifteen minutes.

Bullfinches have this year been very numerous in the district, and gardeners have everywhere been complaining. I believe that the Bullfinch, in nine cases out of ten, destroys the bud in order to get at the insect pest within. But the gardener shakes his head, and fears "Danaos et dona ferentes." I hope that the bad reputation of these birds will not serve to diminish their increased numbers.

Below are a few notes I have made during the past eighteen months or so:—

HEN-HARRIER.—The trapper of Braunton Burrows informed me that two years ago a Harrier was often seen on the Burrows during the winter, and on one occasion he almost stepped on it as it rose at his feet from a depression in the ground with a Rabbit in its claws. I presume this was the Hen-Harrier, although I think that Montagu's Harrier sometimes visits us.

RED-BACKED SHRIKE.—By no means a common bird. I have seen it at Hele, near Ilfracombe, where it breeds in small numbers. It has also been noticed at Bishops Tawton, but is usually found near the coast.

MISTLE-THRUSH.—As I stood looking into a nest of this species, containing young birds almost fully fledged, I suddenly heard a loud "whirr," and then I felt a bird beating its wings on the back of my head. I turned quickly round, and espied the old bird making a precipitate retreat. I wished her to renew this unexpected attack, so I remained where I was. However, she did not again actually touch me, but was contented to vent her wrath by making dashes every two or three minutes straight for my head, and then just at the right moment altering her course so as to sail clear. I have never heard of a bird of this description being so bold.

WHITE WAGTAIL.—A single specimen was seen this spring near the Braunton Lighthouse. It remained a very short time. The Rev. Murray Mathew, in the 'Birds of Devon,' calls this bird a regular spring visitor, but it has of late grown scarcer.

GOLDFINCH.—A local breeding bird. During the autumn and winter many are caught in the clap-net, which is very generally used by the professional birdcatcher. Apart from the destruction so caused to wild life, the play-birds are usually unmercifully attached to wire fasteners in order to be used as decoys, without the risk of their escaping. One nest which I had under observation was stormed

and captured by a pair of Sparrows. They found the cosy structure a very suitable foundation for their own untidy dome of straw and hay.

SWALLOW.—The continental style of nest I have often observed, especially under bridges in the marshes near Braunton Burrows.

GREAT SPOTTED WOODPECKER.—A pair of these beautiful birds were shot by a farmer in an orchard at Bishops Tawton this summer. It is a thousand pities that these rare birds should have been destroyed.

STOCK-DOVE.—I have found many nests of this bird in the sandstone cliffs at Santon. Rabbit-holes are usually selected, and the eggs are laid on a very scanty nest of straw and bents built about a foot in. I believe that they have been observed nesting in Rabbit-holes in the sand-dunes near the Braunton Lighthouse. The Rock-Dove I have not yet detected. The Turtle-Dove is very uncommon, and I have seldom met with it. It breeds at Fremington, and this year I saw a young bird with the baby down still on it in the woods in the neighbourhood of Wrafton.

QUAIL.—Sometimes shot near Braunton, but this year a fine specimen was brought down at Bratton Fleming.

GREY PHALAROPE.—This graceful bird is of frequent occurrence on the mud-flats of the Taw, but in some years it is much rarer than in others. This winter they have been very numerous.

REDSHANK.—Uncommon. Last January there was a small flock on the low rocks beneath Baggy Point, and this autumn I saw a single bird on the Taw, near Heanton Court.

GREENSHANK.—Not met with nearly so often as is the foregoing. A solitary bird was seen this autumn on the mud-flats of the river opposite Fremington. It was exceptionally wary, and when once disturbed flew off, and was not again seen.

CURLEW-SANDPIPER.—In 1904 I distinguished a bird of this species on our river during the latter part of September. This September there were several in a large flock of Dunlin on the sands near Anchor Wood Bank.

LITTLE TERN.—Five of these elegant little birds visited us on May 5th, 1904. They were resting at the water's edge near the Hospital Ship at the mouth of the river. I had them under my glasses for nearly ten minutes.

SCLAVONIAN GREBE.—I have noticed one or two of these birds on the river for the past two winters, and I am inclined to think that they are regular winter visitors.

PUFFIN.—A friend and I saw three at Baggly Point last January. The weather was quite calm, and I cannot imagine what induced this oceanic species to seek the shelter of the coast at that time of the year. In the summer I picked up two dead ones on the sands at Santon after a gale. They are, of course, very common at Lundy during the breeding season.

PINTAIL.—About two years ago a fisherman named Mock shot several ducks of this species in the estuary of the Taw. I believe that they are now in the hands of the local taxidermist.

GREAT BLACK-BACKED GULL.—This and the Lesser Black-backed are constantly seen in the winter months on our river. They are said to breed at Lundy.—BRUCE F. CUMMINGS (Barnstaple).

VERMES.

Malformed Earthworm.—An Earthworm “with two tails,” precisely similar to that figured in your Journal (*ante*, p. 398), but smaller, was exhibited at a meeting of the Hull Scientific and Field Naturalists’ Club seven years ago by Mr. H. M. Foster, a local naturalist, who had obtained it whilst digging for worms at Hull. It is still preserved in spirits, but has shrunk in size.—T. SHEPPARD (Museum, Hull).

A Query.—Answers to some of the queries in your Journal by Major Barrett-Hamilton relating to Bats will be found in an article by Mr. A. Whitaker, “On the Breeding Habits of Bats,” in the November ‘Naturalist.’—T. SHEPPARD (Museum, Hull).

THE ZOOLOGICAL SOCIETY'S GARDENS.

THE additions to the collection of Mammalia were neither numerous nor important during October. Two only are worthy of special mention, namely, a young male Arabian or White Oryx (*Oryx leucoryx*), more commonly but erroneously known as *beatrice*, presented by Colonel Scallon, C.B., D.S.O., and making the third specimen we possess of this species, which is somewhat rare in menageries; and a large and very interesting rodent, the African Cane Rat (*Thryonomys* or *Aulacodus swinderianus*), from Lagos, presented by Captain Macfarlane. This species, which is to be reckoned amongst the largest of existing rodents, full-grown animals measuring about two feet in length, belongs to a group of which all the other members are neotropical in distribution.

The great event in the Bird line has been the completion of the new cages for Owls. Under the wholly erroneous notion that these birds of prey are haters of sunlight, they have been housed for many years in that gloomy brick building—the ornithological Newgate as it was not inappropriately styled—where it was useless to attempt to see them. In their new quarters they most emphatically demonstrate their diurnal tastes by sitting in the open the greater part of the day in sunshine or rain, the Barn-Owls being perhaps the species which takes most advantage of the shelter with which the cages are supplied. Appropriately enough the completion of these cages coincides with the presentation by Dr. Macfarlane of a very rare Owl from Lagos, namely, Bouvier's Owl (*Scotopelia bouvieri*), not previously represented in the collection. From the same donor and locality came a Kite, a Buzzard, and a Wood-hawk (*Dryotriorchis spectabilis*), the latter almost as rare a bird as the Owl. Two more very valuable additions to our series of raptorial birds are a pair of Kolbe's Vultures (*Gyps kolbi*) from Pretoria, presented by Dr. P. L. Sclater. These are placed alongside specimens of Rüppell's Vulture (*G. rüppellii*), and the Griffon Vulture (*G. fulvus*), so that the differences between these three species of the genus *Gyps* may be clearly seen. They are more fulvous even than *G. fulvus*, and further differ from the other species in having the beak larger and black.

R. I. P.

NOTICES OF NEW BOOKS.

The Mammals of Great Britain and Ireland. By J. G. MILLAIS, F.Z.S. Vol. II. Longmans, Green & Co.

THE second volume of this great contribution to a knowledge of our British fauna sustains all the interest and beauty of illustration found in its predecessor. The description of the Carnivora is now completed, and that of the Rodentia very largely contributed, the Otter introducing the volume and the Water-Vole completing it. Again we find the same happy compilation of facts relating to our comparatively few mammals, and a similar wealth of illustration, which is not only zoologically accurate, but, as we might infer from the name of the author, is in the best sense artistic. This feature, combined with the easy method of its narrative, should procure the circulation of the work beyond usual zoological circles; and the private library that can possess the luxury of a good county history should certainly, and will in time most probably, find Mr. Millais's volumes on its shelves.

The generic and specific nomenclature used throughout is what is generally recognised as "advanced" by its followers, and often as the "work of museum naturalists" by those who cling to a more conservative terminology. This, however, is a question scarcely raised by the publication, for its strength rests in its descriptive and bionomical elements, and for the critic who would only discuss its classificatory terms the book has indeed been written in vain. Besides which taxonomical nomenclature is not a creed, nor is it based on dogmas; it has not yet reached finality, remains largely dependent on individual method and opinion, and is simply an indispensable and confidential servant to the study of zoology. In British natural history the trend in opinion to-day is "back to nature," and he who writes in this spirit, as Mr. Millais certainly does, writes best. The method has its dangers, as the constant arrival of publications, hot from the press, written by mistaken successors of Gilbert White, abundantly testify; but Darwinism has unwittingly created a similar set of lame disciples, and how many a novelist has thought that he was a reincarnation of Dickens!

There is so much in these pages that we cannot carp at the little they do not contain, and the terms of our notice of the first volume published last year remain, in our opinion, applicable in every way to the present instalment, in which there is neither discontinuity of method nor departure in charm of illustration.

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