

DESCRIPTIONS
OF THE
RAPACIOUS BIRDS
OF
GREAT BRITAIN.

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TO

JOHN JAMES AUDUBON,

IN ADMIRATION OF HIS TALENTS AS AN ORNITHOLOGIST,

AND IN GRATITUDE FOR MANY ACTS OF FRIENDSHIP,

THIS VOLUME IS DEDICATED

BY

WILLIAM MACGILLIVRAY.

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NOTICE.

The Woodcuts, by which the genera are illustrated, and which have been made by Messrs Sclater and Son, Edinburgh, from original drawings by the Author, represent the parts of half their natural size.

ERRATA.

- Page 121, 18th line from top, *for mangorve read mangrove*
— 126, 2d line from bottom, *omit and emarginate*
— 148, last line, *omit middle*
— 149, first line, *for the inner coat read its surface*
— 194, 3d and 4th lines from bottom, *for the middle coat thin and tough, the inner soft and easily separated read the inner coat thin and tough, its inner surface soft and smooth.*
— 215, 7th line, *insert 12 12*
— 230, 23d line, *for anterior read inner*
— 252, 7th line from bottom, *for daws read dames*

P R E F A C E.

IN preparing this little work for publication, I have been influenced by the following motives. Although, during a somewhat laborious life, I have found it necessary as well as pleasant, to direct my attention temporarily to various branches of Natural History, I have for many years been more especially addicted to the study of Ornithology; and, having made numerous observations on birds, watched them in their haunts, and examined a multitude of individuals, I have thought it not unlikely that the communication of the results of my labours might prove advantageous to those who may not have paid equal attention to the subject. Secondly, Having to depend entirely upon my own exertions for the means of supporting my family and of prosecuting my inquiries, I have judged it expedient to enable those whom it may concern, to form some estimate of my qualifications for advancing the science of Natural History. Lastly, a man is naturally fond of talking about what is generally uppermost in his mind. The love of

money and the love of fame, the two great stimuli to exertion, have not been among the exciting causes of this attempt to describe the Rapacious Birds of my native land. The latter, as a principle of action, I have always considered contemptible; the former seemed to me to have little chance of being gratified on this occasion, for the profits to be derived from the sale of a work which can excite little general interest, cannot afford a recompense for the great labour undergone in composing it.

An apology for offering a new book on birds to those who may be pleased to accept it, is quite unnecessary. It is evident that none which has yet appeared contains perfect descriptions, and it is probable that the best of which we can boast will at no distant period be looked upon as in many respects extremely childish. But, as I am desirous that you should not adopt any prejudice tending to induce you to form an erroneous idea of my performance, I may be allowed to present you with a few particulars of my history, shewing that I have enjoyed excellent opportunities of examining the objects of which I treat. I commenced the study of Zoology in 1817, while qualifying myself for the medical profession at Aberdeen, a city not less famed for learned professors than for dried haddocks. My only guides were Linnæus and Pennant, for at that period I knew no living wight who had any knowledge of the subject, excepting a fellow student, Mr William Craigie, now

in Upper Canada, who accompanied me on my rambles, and most zealously strove to add to our common store of knowledge, both in Zoology and in Botany. How many pleasant and successful excursions, in quest of plants and animals, we made together on the romantic braes of the Don, the pebbly shores of the Dee, the rocks of the Cove, the sands of the sea-shore, and the bleak moors of the interior, I cannot now tell; nor would the enumeration be so interesting to you as it might prove agreeable to myself. The fascinations of these pursuits were such, that, after studying medicine for nearly five years, during part of which time I officiated as dissector to the lecturer on Anatomy at Marischal College, I resolved to relinquish it, and devote my attention exclusively to Natural History. Under many difficulties I persevered, rambled over most parts of Scotland, from the rugged shores of Loch Maree to the romantic banks of the Esk, explored the desolate isles of the west, and walked, with my journal and Smith's *Flora Britannica* on my back, from Aberdeen to London, for the purpose of seeing the country and visiting the British Museum. Having been advised by a friend to engage in a kind of mineralogical speculation, I afterwards went to Edinburgh, where I had the advantage of hearing Professor Jameson's lectures. I then betook myself to the Outer Hebrides, where I hammered at the gneiss rocks, gathered gulls' eggs, and shot plovers and pigeons, until finding the trade dull, I returned to the civilized part of

the country. I now became assistant and secretary to the learned Professor of Natural History in the University of Edinburgh, under whom I took charge of an extensive and beautiful museum, in which I found occasional opportunities of making myself in some degree acquainted with objects which I might not otherwise have been able to examine. The late Mr Wilson, Janitor of the University, who dealt extensively in birds, also allowed me to examine the specimens that passed through his hands. After remaining several years in this place, I thought it expedient to retire; and continued my observations in the fields, supporting myself by my labour in the closet. In 1830 I became a candidate for the Conservatorship of the Museum of the College of Surgeons, which, somehow, without my being acquainted with three members of that learned and most respectable body, and without soliciting the vote of one individual, I unexpectedly obtained, and of which I continue to discharge the duties, not neglecting the opportunities of improving my anatomical knowledge afforded by the numerous skeletons of birds and other animals in that valuable collection. During the whole of this time, excepting about a year, when hope seemed almost to have deserted me, and when I had resolved simply to go through the drudgery of my duty, I have been more or less attached to the study of Ornithology; I have shot, examined, described, and depicted, a very considerable number of our native

birds. With what success my efforts have been crowned, you may have an opportunity of judging some years hence. But as the period at which I purpose to introduce to your notice my great work, as I may call it, is far distant, I have thought that you might not be displeased to receive an account of some of our feathered tribes, even if very imperfect, provided it should convey information not elsewhere to be obtained.

I have, therefore, resolved to lay before you descriptions of the British Birds of Prey, which may possibly be followed by those of other groups. Although I must regret that the work is not complete, even according to the plan which I have laid down for myself, I yet can only request of you to treat it precisely as it deserves, consigning it to neglect, or perusing it with attention, just as you deem it worthy of the one or the other. On this principle I have always acted with respect to myself, and I can shew no more favour to my book. Although I have published many original papers, as well as various translations and compilations, all in the regular way of business, I consider the present as my first work. Viewing it in this light, I might perhaps claim for it a little indulgence, which I believe some readers would be ready to accord. But, as I have said, let it stand by its own merits.

The descriptions you will generally find to be long, perhaps tedious. Yet they are not nearly so full as I should make them, were I to profess to give a de-

tailed history of the species, for then I should describe the entire structure, instead of confining myself chiefly to the external parts. It must be obvious that a bird is not merely a skin stuck over with feathers, as some persons seem to think it, but an organized being, having various complex organs and faculties, the description of all of which is necessary to complete its history. But as the exterior alone of birds has hitherto occupied the attention of ornithologists in this country, and indeed in almost every country, I am unwilling to frighten away the student by a display of bones and muscles, bloodvessels and nerves. He will, however, I am persuaded, agree with me in thinking, that if the bill be an organ of much importance, the parts of which it is merely the commencement must be so too. I have therefore ventured to describe in a brief manner the œsophagus, stomach, and intestines, of all the species of which I have within these eight months been able to procure specimens for that purpose. In this part of my labour I have received little assistance from books, there being none known to me in which the intestinal canal of our birds of prey is described in the different species; nor from any living individual, I having met with none at all acquainted with the subject, although it is probable enough that some persons known to me may have examined the intestines of several species. So far as the descriptions extend, I trust they will be found generally correct.

Although I have been anxious to render the work entirely original, I have on many occasions been obliged to have recourse to the observations of others. These, however, I have always attributed to their authors, not judging it honest to give them as my own in a disguised state, as I observe to be a common practice with men who would scruple to pick their neighbour's pockets, probably because they should run the risk of being sent to study ornithology in Botany Bay. I have not invented any new names, generic or specific, nor cleverly appended a "mihi" to the tail of any species. In some instances, however, I have judged it necessary to alter the English name.

While I acknowledge the obligations which, in common with the world, I owe to persons, such as Montagu, M. Temminck, Mr Selby, and Mr Audubon, who have published descriptions of birds; I am not disposed to forget those generous individuals who have aided me in the prosecution of my inquiries. At the end of the volume you will find a statement of facts relative to this subject.

It remains for me here to offer a few general remarks, having reference to the study of birds, and the manner in which it might be advantageously pursued.

It must be very evident that Ornithology can be successfully prosecuted only by examining the internal structure, the external form, the actions and habits, the

distribution, and the various relations of the objects to which it refers. No person qualified to construct a satisfactory system of arrangement has yet appeared; nor is the requisite knowledge possessed by our race collectively, much less by any individual. Artificial or temporary methods of arrangement, therefore, are the only kinds that can be employed; and the so-called "natural systems," whether in Zoology or in Botany, are as artificial as those confessedly such. They ought to be named Relational or Analogical Systems.

The species of birds may be disposed with reference to their affinities in various orders or series, according as the consideration of one or other organ is assumed as the basis of arrangement. But as the organs of an individual in the series do not undergo equal or analogous modifications, the idea of linear series as capable of connecting species by general affinity must be abandoned. In one point of organization, a species may be allied to another, while in a second point it may resemble a third species; in one point it may adhere to another shewing an evident general similarity, while in another it may indicate an intimate relation to a species which yet in other respects differs extremely.

The collocation of several species constitutes a subgenus, a genus, or a family. But as there are few abrupt boundaries among birds, divisions are often merely arbitrary; whence it happens that what one calls a class, another considers as an order, or even a genus.

Every species is perfect in itself, and forms a centre of affinities. For this reason, the assumption of a species as typical is arbitrary, and merely supplies an object with which others may be compared, for the purpose of composing a group qualified to form part of an artificial system. Any one species being just as typical as another, many birds may be referred to one or another genus, according to the peculiar views of the person who arranges them.

It is impossible in a linear series to shew all the relations of birds, because the successive juxtaposition of the species disrupts their numerous affinities. Neither, for the same reason, can the affinities of species or genera be pointed out by any series of circles or other figures, arranged on a flat surface, such as that of a sheet of paper. Generic groups, to represent affinities, would require to be suspended in empty space, and specific forms would require to be individually extended in different directions, or to present linear prolongations meeting, crossing, or uniting with those of other species. But a generic group has so many affinities with other groups, that the disposition of such groups in space according to relation is impossible. Still more complex would be the disposition of species, were it practicable; wherefore the linear series, that is the arrangement of species one after another, whether the series be straight, curved, circular, or disposed in some other form, is the only practicable one.

Birds may be disposed in linear series according to certain affinities, so as to run on in an uninterrupted line; but by such an arrangement numerous relations must be severed, and each particular species stands in its place, retaining, if one may so speak, only a portion of its members, the rest being left connected with other and often distant species.

Since the affinities in a linear series cannot be derived from every part of the organization, those of most importance ought to be selected.

The plumage in its texture and colouring indicates affinity, but in a low degree; for in the same single species are often found several varieties of plumage, while in another species of the same genus the plumage may be nearly simple, and in two allied species it may be extremely unlike, while in two most distant species it may be almost or entirely similar. Affinities are indicated by the wings and tail more than by other parts of the plumage; by the former more than by the latter; but birds, in other respects very dissimilar, may have wings so nearly of the same form that the same description might answer for both.

The feet indicate affinities better, as being intimately connected with the habits, and with internal organization, particularly with that of the digestive organs. The general form of the body, also that of the organs specially, afford good characters of comparison.

Of the various organs, the digestive are best adapted,

not in birds only, but in the whole series of the vertebrata, for indicating the order of arrangement, or as affording a centre of affinities, because their variations are more perceptible. Under this head, however, is to be included the whole series of parts from the bill to the extremity of the rectum.

All arrangements of birds hitherto published, whether professing to be derived from the consideration of the aggregate of the organization or not, are merely artificial, inasmuch as, in their details, reference is had only to one or a few sets of organs. In all systems, the consideration of the bill is the great principle of arrangement, and in that respect the system of Cuvier is just as artificial as that of Linnæus.

Considering the organs or parts according to their relative importance, we might dispose birds in a linear series; which would answer all the purposes of an arrangement, provided the other affinities were pointed out by description. In the linear series, of every three species the central ought in some essential respect to be most nearly allied to those next it. The same remark applies to genera and orders. According to these premises, the linear distribution ought to be circular. We may commence at any point, that is, with any particular species of bird, and add to that species, on either side, until the order is completed.

Were such an arrangement founded upon the consideration of a single organ, there could be no variation,

for if the idea were completely followed out, any number of persons constructing a system separately would come to the same conclusion; but the consideration of a single organ, the bill for example, would lead to numerous inconsistencies with respect to other organs.

In the following pages I shall dispose the objects according to their affinities as exhibited by the bill, the intestinal canal, the feet, the plumage, the wings, the tail, and the general form; but as in the fauna of a district or country, where materials are not afforded for a general system, the genera must succeed each other, sometimes over wide gaps, it is not so essential to exhibit all the relations of species as to associate them according to their more obvious affinities.

Finally, species alone exist in nature. Genera, orders, classes, and all other sections, by whatever name called,—tribes, subtribes, families, subfamilies, &c. are merely ideal groups of species. Naturalists have not agreed as to what constitutes a genus or an order; and I have only to explain, that what I here consider a genus is a group of species, shewing an evident affinity to each other in respect to all their more important organs. Another person may call such a group a genus, a subgenus, or a subdivision of an order; but these distinctions are merely arbitrary; and, provided one has an idea of what he means by the phrase genus or class, whether that genus or that class correspond with those of another arrangement, is not of the least importance.

As the species alone is fixed, it were well to consider the specific name once imposed as unalterable; and upon this principle I shall always proceed, unless that name has become liable to serious objections. The specific names imposed by Linnæus, the first great reformer of natural history, ought to be held inviolable; and a specific name ought never to be converted into a generic one, when a group is broken up. The reason of this is obvious, and deviations from the rule as obviously result from the desire of appending the so anxiously coveted "mihi." It is the duty of every one desirous of advancing the science to pluck the borrowed plumes from those jackdaws. Should the knowing critic discover any spurious feathers on my occipital region, or elsewhere, I request of him to blow them off. From the professed ornithologists I expect little favour, and very certain it is that I desire none.

I have observed that students of natural history follow very different paths in the acquisition of knowledge. Some are merely desirous of knowing objects by name. They learn to distinguish the skins of birds in a museum, the shells in a cabinet, and the plants in a herbarium, by fixing upon one or two characters; and they believe that the description of a species may with advantage be confined to a dozen words:—*Homo sapiens. Erectus, capite subgloboso, pedibus duobus, canda obsoleta.* It is in vain to argue with such persons. They hate every thing that they deem superfluous, dock their

hobbies to the rump, crop their ears, and pare their hoofs to the quick. Between these effigies of naturalists, and the true flesh-and-blood philosophers, there are various gradations. For my part, instead of considering four hundred duodecimo pages sufficient for the description of twenty-seven species of birds, I am convinced that a tolerably full account of any one of them, the Golden Eagle for example, would extend over a greater space. Although my descriptions are generally much longer than any hitherto published, they are yet so defective, that I cannot apologise for their length. It is obvious, that a man who knows one plant or one animal well, has more knowledge than he who can merely name a hundred or a thousand; and for this reason, I would that every student of nature should in his researches penetrate a good deal deeper than the cuticle of a plant, the scales of a fish, or the feathers of a bird.

RAPACIOUS BIRDS

OF

GREAT BRITAIN.

INTRODUCTORY REMARKS

ON

THE BRITISH BIRDS OF PREY.

It is not entirely consistent with the object of this Treatise, to offer a formal arrangement of the Predaceous Birds that are dispersed over the globe; nor is the knowledge of its author sufficient to enable him to perform such a task, in a manner satisfactory, either to himself or to others. The general observations which he presumes to lay before his readers will therefore be confined to those species, genera, and families, which occur in our own island.

The Rapacious Birds of this country are all included in the genera *Falco* and *Strix* of Linnæus, or the two great families of Falconine and Strigine Birds, the former comprehending Eagles and Hawks, the latter Owls. The Order of Rapacious Birds, however, embraces, besides these two families, another, that of the Vultures, which has no representative among the spe-

cies that are found in Britain, and of which, so far as I know, only two individuals of a single species have been seen at large in that country.

The general characters of our Eagles, Hawks, and Owls are more easily elicited than those of the entire order of Rapacious Birds; for many circumstances of organization and habits observed in some, are not common to them and the rest, and very few, if any, can be pointed out as belonging equally to all the species. It is in truth extremely difficult to define the rapacious birds as forming an order or great division of a class. Thus, a celebrated anatomist states, that "they are distinguished by their hooked bill and claws, which enable them to seize other birds and even weak quadrupeds and reptiles;" but the claws of some vultures are not hooked, few of these birds use their talons for seizing prey, and many species of the order live almost exclusively upon carrion; besides, the bill and claws of many others belonging to different families are hooked, as in the genera *Cataractes* and *Lestris*. "The muscles of their thighs and legs, he continues, are indicative of the power of their talons;" yet by many of these birds the talons are not employed for pouncing upon or grasping their prey. A celebrated ornithologist, in like manner, describes the feet as strong, muscular, short or of moderate length, and yet gives as the character of the genus *Gypogeranus*, which he places in this order, "feet very long and slender." Characters

of this kind are neither comprehensive nor distinctive; they resemble those employed by some botanists, who it seems have discovered a natural method, and who give, as "essential characters," such marks as these:— Trees, shrubs, or herbaceous plants; leaves mostly compound, pinnate or ternate, or simple; flowers in spikes, racemes or panicles, sometimes solitary.

It is, in fact, impossible to frame a perfect character for any group of birds, seeing the species of every large genus exhibit modifications connecting them with the species of many other genera; and Nature, so far as I can guess her views, will not consent to allow her productions to be confined within triangles, squares, pentagons, or circles, nor even to be drawn out into straight lines, single or parallel. Her disposition of these objects seems to me to be divergent, inosculant, and intricate in such a degree, that no human intellect can possibly comprehend it. Some arrangement, however, is necessary, for, without it, the student could not form any definite conception of the beings described; and, in my opinion, it is of not much importance what method one adopts, provided it afford a tolerably correct idea of the affinities of the species. But before we should be able to group the objects in a somewhat natural manner, or in one that might exhibit a considerable number of their relations, we should have to make ourselves acquainted with the organization of those objects. Now, so little has been done in this re-

spect, that at the present day no account, however imperfect, exists of the various organs of the species of any order of birds. The alimentary canal itself, the examination of which seems to me to form the very basis of all real knowledge of animals, has been so much neglected, that, if you consult all the works on comparative anatomy that have appeared in this country, and all the so-called descriptions of birds, from those of twelve words to those of as many paragraphs or pages, you will not be able to collect enough to afford you any idea of its various modifications even in the species of the single Linnæan genus *Falco*. Anatomists are generally unacquainted with species, and they describe or place on a shelf in their cabinet, "a Hawk," or "an Eagle;" but whether that hawk be a falcon, a kite, a sparrow-hawk, or a hen-harrier, they do not inform us, doubtless because they conceive such information to be useless. The mere dry-skin naturalists, on the other hand, present copious accounts of the colours of the plumage, the form of the bill and feet, and such like circumstances connected with the external appearance of birds; but not a word can they say respecting their organization. Even the field naturalists, who shoot and handle actual birds, and not merely skins stuffed with straw or some other substance, seldom extend their inquiries beyond the length of the guts, the capacity of the gullet, or the knobs on the windpipe. Alas for the "higher order of naturalists," the philosophical system-



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makers, who depend upon such materials when they build their castles! How absurd is it for one who has superficially examined the mere exterior of a hundred or a thousand birds, to pretend that he can place them in the order of nature!

But, as I have said, every person in writing on birds must follow some method; and although I am not qualified to dictate, like some sage who has acquired great celebrity and much self-sufficiency; yet, for the benefit of such of my readers as, being unacquainted with birds, may desire to know how they may distinguish the rapacious species from the rest, I must endeavour to elaborate a few general characters. I therefore proceed *more majorum*; but let me first offer a few remarks on the intestinal canal.

In Plate I. are represented, on a small scale, the œsophagus, stomach, and intestines, of the Common Buzzard, *Buteo vulgaris*. Fig. 1. exhibits: *1st*, The œsophagus or gullet, which is thin or membranous, dilat-able, expanded anterior to its entrance into the thorax, so as to form a large sac or crop, which is surrounded by muscular fibres, afterwards contracted, and at its lower part somewhat enlarged, that portion, the pro-ventriculus, being studded with cylindrical glandules, the central cavities of which open upon the inner or mucous membrane. *2dly*, The stomach, of a roundish form, having two small central tendons, of which the anterior only is seen, and a thin muscular coat formed

of fasciculi radiating from the tendons, the inner coat being soft and even. *Sdly*, The intestine, convoluted in the posterior part of the abdomen, coming off at the upper and back part of the stomach, near the cardiac or œsophageal orifice, gradually contracting as it approaches the rectum, at the commencement of which are two very small cœca; the rectum itself is much enlarged, lies behind the rest of the intestine, and terminates in the cloaca or globular expansion, partly visible in the figure. The rectum, artificially inflated with air, is represented by Fig. 2. At the lower part is the globular cloaca, then the rectum, properly so called, at the termination of which are seen the two papilliform cœca, the part above which is the extremity of the small intestine.

Plate II. represents the same parts in the Common Long-eared Owl, *Strix Otus* of Linnæus. The œsophagus, Fig. 1, is nearly uniform in diameter in its whole length, being destitute of the dilatation or crop so conspicuous in that of the Buzzard and most other species of the Falconine family. At its lower part is seen the proventriculus studded with roundish glands. The stomach is nearly globular, and of the same structure as in the Buzzard, but with the muscular fibres more fasciculate. The intestine also is similar, and terminates in a large cloaca, which is partly seen at the lower part of the figure. The rectum, inflated, is represented by Fig. 2, which exhibits at its lower

Fig 2



Fig 1



•

part the cloaca, then the rectum, which is much wider than the rest of the intestine, and from the upper extremity of which come off laterally the two cæca, which are much larger than those of the Buzzard, very narrow in their lower part, but dilated above into an oblong or pyriform sac.

Supposing these two plates to represent the intestinal canal of the Hawks and Owls, we see that in the former the œsophagus differs from that of the latter in having a crop-like dilatation, while the cæca are much larger in the owls than in the hawks, and of a very different form.

These circumstances, however, will be more particularly explained in the generic and specific descriptions. In the mean time, what has been said will suffice to give a general idea of the form and structure of the parts in question.

The dilatation of the œsophagus is obviously intended to afford a receptacle for that portion of food which the stomach is unable to contain, when a hawk has been so fortunate as to secure a comparatively large animal. I have, in several instances, found both the crop and the stomach, as well as the intermediate space, packed with flesh and other substances. I have also observed that no digestion takes place in the dilated part of the œsophagus, which is not properly speaking a crop, as it is not furnished with glands. Digestion commences in the proventriculus, and is com-

pleted in the stomach. After the whole contents of these cavities have been gradually disposed of, the indigestible matter, such as hair, feathers, teeth, and elytra, are formed into pellets, and ejected by the mouth. It is a curious fact, that, when a hawk or an owl has swallowed a small bird, in the stomach of which have been seeds, these bodies are not dissolved by the gastric fluid. The cuticular lining of gizzards also remains undigested. As to the owls, I have rarely found any thing remaining in their *œsophagus*; but this may depend upon the circumstance of their seldom obtaining much food at a time, as they generally prey on small animals.

AVES RAPACES.

RAPACIOUS BIRDS.

THE species of this order may generally be distinguished from the other land birds by their form, which adapts them for tearing and devouring the flesh of animals. It is true some of them swallow insects, mice, shrews, frogs, and other animals, entire; but all have the means of tearing up flesh, inasmuch as they are furnished with a bill, either short or of moderate length, having a sharp hooked tip, curving over the extremity of the lower mandible. Most of them have long sharp curved claws, with which they pierce their victims; but there are species among the vultures which employ their claws, not for seizing live animals, but for holding down their food while they tear it. The feet of all are furnished with four toes, placed on the same level, fleshy, and as it were, padded beneath, where they are covered with small rounded or conical papillæ. Their tongue is fleshy, on the back horny, sagittate and papillate at the base. The intestinal canal varies in the different species; but the œsophagus is always wide, frequently dilated into a kind of crop; the proventriculus studded with cylindrical glandules secret-

ing a digestive fluid ; the stomach nearly membranous, having its muscular coat very thin, and furnished with small central tendons ; the intestine slender, and generally having two small cœca near its extremity. They have a powerful and rapid, or light and buoyant, flight, being furnished with long and frequently ample wings. The females are larger than the males, and they rarely produce a brood exceeding three or four.

Many writers divide the Rapacious Birds into Diurnal and Nocturnal,—the former being the Vultures, and the Eagles and Hawks, the latter the Owls. But even here, as if we could not proceed a step in our classifications without doing violence to nature, there is error ; for some owls prey by day, and several hawks in the twilight. However, speaking vaguely, we may say that the arrangement is convenient. We now proceed to the examination of the Diurnal British Birds of Prey.

FAMILY I. FALCONINÆ.

EAGLES AND HAWKS.

THE eighteen species of this family that occur in Britain, agree in the following circumstances. Their body is ovate, compact, much deeper and broader before, on account of the great development of the pectoral muscles, and the width of the furcula; their neck short; their head large, or of moderate size; their wings long and broad; their tail either long or of moderate length.

The skeleton varies greatly in the different species, being extraordinarily strong in the eagles and the larger falcons, and comparatively slender in the sparrow hawk and harriers. The cranium is short and broad, occupying only that portion of the head which naturalists term the occiput; the orbits are extremely large, and separated by a bony septum, having a roundish or oblong hole in the centre: in some, as the eagles and falcons, there is a superciliary bone attached to the lachrymal; the nasal cavity is large, as is that of the organ of hearing. The cervical vertebræ are commonly twelve, the dorsal nine, the united lumbar and sacral eleven or twelve, the caudal eight, sometimes nine, the last one large and cultriform; the true ribs are seven, and, excepting the last, have an elongated process

from the posterior edge, directed upwards and backwards. The sternum is large, and of great length, deeply concave, and completely ossified, there being only two small apertures left near its posterior angle; its ridge or crest is high. The clavicles are remarkably stout; the furcula very wide and arched, its crura disposed so as to resemble the letter U; the humerus and cubitus elongated, and very strong. The pelvis, although small and incomplete when compared with that of a quadruped, is large and strong in comparison with that of other birds; the femur strong and of moderate length; the patella distinct; the tibia long, and having the slender fibula partially ankylosed to it; the tarsus, or more properly metatarsus, generally short and strong, but in some cases slender; the hind toe articulated to a small separate bone, and having two phalanges, the second three, the third four, the fourth five.

The bill does not in any case exceed the head in length; it is furnished at the base with a cere, which is partially bare. The upper mandible has its tip acute, prolonged, and curved over the abrupt or rounded extremity of the lower. The palate is flat, and marked with two longitudinal soft prominent lines or ridges; the aperture of the internal nares oblong behind, linear before, and generally furnished at its margins with papillæ. The tongue is soft, fleshy, oblong, sagittate and papillate at the base, grooved or concave above, horny beneath towards the end, its extremity simply rounded or emarginate. The aperture of the glottis is defended behind by numerous papillæ directed backwards. The fauces are wide, as is the œsophagus, which is more or less dilated anterior to the furcula, into a membranous

pouch or crop, which always projects on the right side of the trachea. It is encircled by inconspicuous muscular fibres, and its internal membrane is either plain or raised into longitudinal rugæ. At its lower part, its walls are much thickened, there being interposed between its outer and inner coats numerous small cylindrical glandules, having a central cavity into which a viscid fluid is secreted, and from which it passes into the stomach. The glandules completely surround the cavity of the proventriculus, which being little enlarged in this family, seems rather to belong to the œsophagus than to the stomach, but in some species they are slightly separated into groups by longitudinal grooves. The latter organ is of moderate size, roundish or broadly elliptical, more or less compressed. It is covered with fasciculi of muscular fibres, which converge towards two thin roundish tendons placed on its opposite flattened sides. These fibres seem to run continuously from one tendon to the other, there being no apparent line of insertion along the edges of the organ. The inner coat is very soft, smooth or slightly villous, destitute of rugæ, and, when the bird has been dead for some time, is usually in part dissolved by the gastric fluid. The pylorus, which is placed very near the cardiac orifice, on the upper and hind part of the stomach, is furnished with a marginal rim, under which there is in some species a valvular apparatus. The intestine is slender, its upper fourth wider, the rest very narrow, and continuing of a nearly uniform diameter to the rectum; at the commencement of which are two very small cœca, not exceeding a quarter of an inch in any species. The rectum is wider, and towards the end

dilated into a globular, oblong, or funnel-shaped cavity.

The eyes are large, in some degree inclined forwards, so that an object can be perceived with both; the eyelids are equally mobile. The nostrils are small or of moderate size, but in form vary extremely in the different species; they are placed in the fore part of the cere. The aperture of the ear is rather large, and either round or oval.

From the length, form, or covering, of the legs and toes, no general characters can be derived; for in some the former are short and thick, in others long and slender; in some feathered, in others bare, and either scutellate in front or scaly all round; while the toes vary as much in their relative length and other circumstances. The toes are four, the hind one shortest and proportionally stronger, the third longest; they are all scutellate towards the end, sometimes along their whole extent, and are soft, fleshy, tuberculate, and papillate beneath. The claws are long, curved, very acute, and having a great range of motion.

The wings are always long and broad, but vary in form, being in some rounded, in others pointed. The primary quills are, as in most families, ten; the secondary or cubital vary from thirteen to eighteen. The tail is generally long, even, rounded, or forked, and is always of twelve feathers. No distinctive characters, therefore, can be derived from these organs.

The same remark applies to the plumage, which is generally strong and compact on the upper parts, although sometimes soft and rather blended; while on the lower it is sometimes compact, but often soft and

downy. In most species the external tibial feathers are elongated so as to form tufts, but in one, the osprey, all the feathers of the tibia are remarkably small and short. The whole body is clothed with soft down, and in many species the anterior part of the breast, and a portion of the abdomen, are destitute of feathers, although the down of those parts is covered by the feathers arising in their vicinity.

These birds prey upon quadrupeds, birds, reptiles, fishes, and insects; some of them also feed on dead animals, so that no definite general character can be obtained in this respect. They carry off their prey in their talons, tear it up with their hooked bill, generally swallow the smaller bones and part of the hair and feathers, which, with the undigested portions of insects and other animals, they cast up in pellets. Small animals, as lizards, mice, and insects, are often swallowed entire. They always seize their prey with their talons, and kill it by thrusting their claws into it.

Their vision is extremely acute, but in what degree they possess the senses of smelling, hearing, touch, and taste, is not easily ascertainable, although the latter is probably very perfect.

Their flight is strong and protracted, in some species extremely rapid, in none slow or laborious. Most of them ascend to a great height, and sail or float in circles, as if for amusement. Their feet being essentially formed for grasping, they easily alight on branches or rocks, but some of them repose on the ground. They are, however, very ill adapted for walking, as may be understood on comparing them with those of a bird noted for speed, such as the ostrich, the bustard, the

ring-plover, or the purre. These birds have the toes comparatively short, their lower surfaces flat, the hind toe either elevated and small, or wanting, and the claws very small and blunt. In the falconine birds, on the contrary, the toes, although not always long, have their lower surface knobbed or padded, the hind toe is large and on the same plane, and the claws are long, curved, and sharp. The consequence is, that some of them cannot walk at all, as Mr Audubon informs me is the case with the osprey; others, as the eagles, walk so ill, that when they require to move to short distances on the ground, they prefer leaping, and use their wings to aid them, and even the lighter species rather hobble than walk. On trees, on the contrary, they perch with great security; and such is their grasp, and the tendency of their claws to contract or curve downwards, that, when shot, they sometimes cling to the branch. When standing on plain ground, they retract their claws, so that the sharp points are not liable to be injured.

The different species are averse to others of the same family, and even individuals of the same species are seldom seen together. None are gregarious even in the slightest degree. They live solitarily, or in pairs, like the animals of the feline family, to which they are analogous. Their cries are sharp and loud, but are seldom heard excepting during the breeding season, which commences about the middle of spring. Their nest is rude and flat, generally composed of twigs, dry grass, and some soft materials. The eggs vary from two to five, are generally broadly elliptical, but sometimes regularly ovate, and vary in colour, some species having them pure white, others dotted, spotted, or

clouded with red or brown. The larger species have fewer eggs than the smaller. The young remain long in the nest, and, when able to shift for themselves, are driven off by their parents. The old birds generally remain together in pairs through the winter, and, unless much disturbed, breed in the same spot for years. Nothing general can be said as to the place of nesting; some breed in rocks, others on trees, or on the ground.

They begin to moult early in the season, and the change of plumage is always very gradual. In some species new feathers are observed at all seasons, as is the case more especially with the eagles, which in this respect resemble the grouse and some other birds. In all, the young differ considerably in colour from the old; nor is it until the second, and in some cases the fourth or fifth moult, that the characteristic plumage of the adult is obtained. When the young have longitudinal spots on the breast, the old have them transverse, but in some species the spots merely become narrower; and some which have longitudinal spots or streaks when young, have narrow transverse bands when old. The older the individual becomes, the lighter or more grey are the colours, and the more do the spots and streaks tend to become obliterated. The females in some species resemble the males, but in others differ greatly in colour. In size there is always a greater or less difference between the sexes, the female being larger. When the sexes differ in colour, the young of both resemble the females.

There is no partial moult in any of our species, nor any temporary growth of feathers on particular parts, like the crests of cormorants. The feathers in being

worn merely become ragged at the ends, and do not lose their edges in a regular manner. The colours fade considerably by long exposure to the weather, but no very remarkable changes are produced.

Most of these birds may be partially tamed, and several species were formerly trained for hunting, especially those of the falcon and hawk genera. They thrive well in captivity, and live to a great age. Even the eagles are quite patient of subjection, although there is a rhyme which states, that although

“ The captive thrush may brook its cage,
The prison'd eagle dies for rage.”

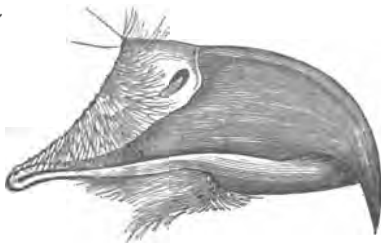
Some species, as the kestrel and sparrow hawk, are generally distributed over the island, while others, as the eagles, are confined to particular districts. None of the species are very plentiful, and some are extremely rare, while a few can be considered only as occasional visitants. These birds would doubtless be much more numerous, were it not for the care bestowed on the preservation of game, which causes great destruction among them. Indeed it is somewhat wonderful that so many remain in the land, seeing the perpetual war that is waged against them by shepherds, farmers, gamekeepers, and others. But as all the species are shy, and many of them nestle and perch in inaccessible or unfrequented places, there is little chance of even the golden eagle or the peregrine falcon being totally extirpated.

Our eighteen species may be disposed into half as many genera. One might naturally object to this arrangement, supposing that a smaller number of genera

might suffice for a greater number of species; but the groups would be extensive were all the species that occur in other countries to be added to ours. I here present a short table of the genera and species, in which I employ empirical characters, such as may enable a person to discover the name of a particular bird that he may chance to obtain. After this, he may peruse its description as subsequently given.

GENUS I. HALIAETUS. SEA-EAGLE.

Bill nearly as long as the head, very deep, and narrow, its upper outline nearly straight as far as the curvature of the tip, the edge of the upper mandible with a slight festoon; nostrils oblong, oblique; tarsi short, rounded, bare for two thirds, with about seven large scutella or broad scales; claws large, flattish, and narrow beneath. Page 49.



BILL OF HALIAETUS ALBICILLA.

1. *H. Albicilla*. *White-tailed Sea-Eagle*.—Of the adult of both sexes the plumage of the head and neck brownish-grey, the tail white. Of the young, the plumage pale brown, with elongated spots of dark brown, the tail brownish-black, irregularly variegated with white. Page 53.

GENUS II. AQUILA. EAGLE.

Bill shorter than the head, very deep, its upper outline nearly straight as far as the curvature of the tip, the edge of the upper mandible with a slight festoon; nostrils oblong, oblique; tarsi short, rounded, feathered; claws large, flattish and narrow beneath. P. 86.



HEAD OF AQUILA CHRYSÆTUS.

1. *A. Chrysaetus*. *Golden Eagle*.—Dark brown; the head, neck, and legs light yellowish-brown. The young birds brown, with the base of the tail white. P. 89.

GENUS III. PANDION. OSPREY.

Bill much shorter than the head, deep, but broader than in the Eagle, its upper outline sloping a little to the edge of the cere, then curved in the third of a circle, the edge with a slight festoon; nostrils oblong, slightly curved, oblique; tarsi very short and thick, covered all round with imbricated scales; those on the sides and lower part of the very strong toes conical. Claws very large, rounded beneath. P. 109.



HEAD OF PANDION HALIAETUS.

1. *P. Haliaetus*. *Osprey*.—Brown above, white beneath. Of the young, the feathers of the back tipped with white. P. 113.

GENUS IV. BUTEO. BUZZARD.

Bill, as in all the following genera, much shorter than the head, compressed towards the end, its upper outline sloping a little to the end of the cere, then curved in the fourth of a circle, the edge with a distinct rounded festoon, and a slight undulation behind it; nostrils elliptical, oblique; tarsi strong, feathered, or bare, in the latter case with broad scutella before and behind; wings long, broad, rounded, the third or fourth quill longest. P. 126.



HEAD OF BUTEO VULGARIS.

1. *B. vulgaris*. *Common Buzzard*.—Tarsi bare; plumage deep brown, the lower parts variegated with white. P. 130.

2. *B. lagopus*. *Rough-legged Buzzard*.—Tarsi feathered; plumage brown above; tail white in its basal half. P. 141.

GENUS V. FALCO. FALCON.

Bill short, very strong, its sides convex, its upper outline curved from the base, the edge of the upper mandible with an angular process near the tip; nostrils round, with a central papilla; tarsi short, covered all round with scales; wings long, pointed, the second quill longest. P. 148.



HEAD OF FALCO PEREGRINUS.

1. *F. islandicus*. *Gyr Falcon*.—Wings much shorter than the tail; the old birds pure white, or white with dusky spots; the young grey. P. 152.

2. *F. peregrinus*: *Peregrine Falcon*.—Wings nearly the same length as the tail. Adult bluish-grey above, white beneath, the breast transversely spotted, the head, and a band on the cheek, black. Young blackish-brown above, the breast reddish, with longitudinal dark spots. P. 159.

3. *F. Subbuteo*. *Hobby*.—Wings longer than the tail. Male greyish-black above, whitish beneath. Female dark brown above, reddish-white beneath; both with mystachial patches and longitudinal dark markings on the lower parts. P. 182.

4. *F. vespertinus*. *Orange-legged Falcon*.—Wings of about

the same length as the tail. Male deep bluish-grey, except the abdomen and legs, which are yellowish-red. Female with the upper part of the head yellowish-red, the back greyish-blue barred with black, the tail grey, with black bands. Young with the back deep brown, the feathers edged with light red. P. 187.

5. *F. Tinnunculus*. *Kestrel*.—Wings shorter than the tail. Male with the head, hind neck, rump, and tail, ash-grey, the back light red spotted with black. Female with the upper parts and tail light red, transversely spotted and barred with black. Young similar to the female. P. 193.

6. *F. Æsalon*. *Merlin*.—Wings shorter than the tail. Male greyish-blue above, each feather with a dark central line, light reddish-yellow beneath, with oblong dark brown spots. Female greyish-brown above, yellowish-white with large brown spots beneath. Young brown above, spotted with pale red. P. 210.



HEAD OF *FALCO ÆSALON*.

GENUS VI. ACCIPITER. HAWK.

Bill short, strong, its sides sloping, its upper outline curved from the base, the edge of the upper mandible with a prominent festoon beyond the middle; nostrils ovato-oblong; tarsi rather long, compressed, with oblique scutella anteriorly and on the sides, and oblong plates behind; wings much rounded; tail long, even. P. 229.



HEAD OF ACCIPITER NISUS.

1. *A. Palumbarius*. *Goss Hawk*.—Male bluish-grey tinged with brown above, head brownish-black, lower parts white, transversely barred with dark grey. Female hair-brown tinged with grey above, lower parts as in the male. P. 233.

2. *A. Nisus*. *Sparrow Hawk*.—Male dark bluish-grey above, reddish-white beneath, transversely barred with yellowish-red. Female brown tinged with grey above, greyish-white beneath, barred with dark grey. P. 240.

GENUS VII. PERNIS. BEE HAWK.

Bill compressed towards the end, its upper outline convex, and sloping to the edge of the cere, then curved in the fourth of a circle, the edge with a very slight festoon; the loreal feathers small, dense, imbricated. P. 225.



HEAD OF PERNIS APIVORUS.

1. *P. apivorus*. *Bee Hawk or Honey Buzzard*.—Male with the head and cheeks grey, the upper parts umber-brown, the breast white, with broad bands of brown. Female with the forehead bluish-grey, the upper parts umber-brown, the lower pale red with reddish-brown spots. Young with the head white, spotted with brown, the upper parts deep brown. P. 259.

This species is easily distinguished from any British bird of the family by the peculiar form and texture of the loreal feathers.

GENUS VIII. MILVUS. KITE.

Bill compressed towards the end, its upper outline convex and sloping to the edge of the cere, then curved in the fourth of a circle, the edge with a festoon beyond the middle; the wings very long, with the fourth quill longest; the tail very long and forked. P. 268.



HEAD OF MILVUS REGALIS.

1. *Milvus regalis*. *Kite*.—Male with the upper parts brownish-red, with narrow longitudinal blackish-brown spots, the lower parts of a lighter red. Female with the head greyish-white, the other parts as in the male. Young of a deeper red. P. 272.

Easily distinguished from any British bird of the family by its long forked tail.

GENUS IX. CIRCUS. HARRIER.

Bill short, attenuated and compressed towards the end, its upper outline sloping to the edge of the cere, then curved so as to form less than the fourth of a circle; tarsi long and slender, with large scutella before and behind; plumage very soft; a ruff of recurved feathers from behind the eye to the chin. P. 285.



HEAD OF FEMALE CIRCUS CYANEUS.

1. *C. æruginosus*. *Moor Harrier*.—Dark umber or chocolate brown. The adult with more or less white on the head. P. 289.

2. *C. cyaneus*. *Common or Ring-tailed Harrier*.—Tail about two inches beyond the wings, the third and fourth quills almost equal. Male light bluish-grey. Female umber-brown above, pale reddish-yellow with brown streaks beneath. P. 298.

3. *C. cineraceus*. *Montagu's Harrier*.—Tail of the same length as the wings, the third quill much longer than the fourth. Male light bluish-grey, the wings with a black band. Female umber-brown above, pale red beneath. P. 314.

The genus *Haliaetus* has the largest and highest bill; *Aquila* is that which has the bill next in length and height. In *Pandion* it is shorter and broader. The bill of *Buteo* resembles that of *Aquila*, but is proportionally smaller, with its upper outline more sloping. In *Falco* the bill resembles that of *Pandion*, but is shorter, thicker, and furnished with an angular process on the edge of the upper mandible, the nostrils round with a central papilla. *Accipiter* has merely a prominent festoon on the edge; the nostrils are oblong, without a central prominence; the bill otherwise similar to that of *Falco*, but smaller and more compressed. *Pernis* has the bill like *Buteo*, but the loreal space is covered with small compact feathers. *Milvus* has a similar bill, but the feet and tail are different. Lastly, *Circus* has the bill more slender and tapering than that of any of the above genera, and is further distinguished by the ruff of feathers.

Agreeably to these and other circumstances, the genera might be arranged thus:

	HALIAETUS.	
AQUILA		PANDION
BUTEO		FALCO
PERNIS		ACCIPITER
MILVUS.		
	CIRCUS.	

This arrangement may, of course, be converted into the circular form. But another, with a central genus, is quite as natural. Thus:

	HALIAETUS	
	AQUILA	PANDION
BUTEO	FALCO	ACCIPITER
PERNIS		CIRCUS
	MILVUS	

Or they may be disposed in the following manner, in a double circle :

	HALIAETUS			
	PANDION			
MILVUS	PERNIS	FALCO	BUTEO	AQUILA
	ACCIPITER			
	CIRCUS.			

Or in transverse, direct, or diagonal series of three; and here we have the mystical number:

BUTEO	AQUILA	HALIAETUS
PERNIS	FALCO	PANDION
MILVUS	CIRCUS	ACCIPITER.

Many other, equally *natural*, arrangements might be proposed, and each of them, as well as the above, might afford ample scope for exposition. In fact, a good commentary on these four figures would occupy a hundred pages or so. I therefore leave them to the learned.

The number of vertebræ in six species of this family is as follows :

	Cervical.	Dorsal.	Sacral.	Caudal.
<i>Haliaetus Albicilla</i>	11	9	12	8
<i>Aquila Chrysaetus</i>	12	9	12	8
<i>Buteo vulgaris</i>	12	9	11	8
<i>Falco Tinnunculus</i>	12	9	12	8
<i>Falco Æsalon</i>	12	9	11	9
<i>Circus cyaneus</i>	12	8	12	8

The posterior dorsal vertebræ are sometimes, but rarely, ankylosed. It will be understood that I do not allude to the lumbar and sacral, which with the pelvic bones form a large continuous mass, so that their number can be determined only by counting the foramina.

HALIAETUS. SEA-EAGLE.

BILL nearly as long as the head, very deep, compressed, straight, with a long curved tip: upper mandible with a broad bare membrane or cere at the base, its dorsal outline nearly straight until towards the end, where it forms about the third of a circle, the ridge convex, the sides flattish and slightly sloping, the edges sharp and overlapping, nearly straight, with a slight festoon, the tip deflected, trigonal, acute, at its lower part perpendicular to the gape-line; lower mandible with the angle medial, rather narrow, rounded, the dorsal line slightly convex, the ridge rounded, the sides slightly sloping outwards, the edges sharp, inflected, straight until near the tip, which is obliquely truncate and rounded.

Mouth of ordinary width; palate flat, with two longitudinal prominent lines; upper mandible concave within, the lower more deeply so; the palatal slit defended by acute papillæ, the glottis also papillate behind. Tongue papillate at the base, short, fleshy, slightly concave above, rounded at the extremity with a shallow notch. Œsophagus wide, dilated about the middle, so as to form a rather large single crop; and at the lower part gradually enlarged and glandular, the cylindrical glandules forming a broad belt. Stomach

large, compressed, oblong, slightly curved, the muscular coat very thin; the two central tendons small and thin; the inner coat soft, without rugæ. Pylorus with a valve formed of three projections. Intestine very slender, nearly uniform in diameter until towards the extremity, when it is considerably dilated; no cæca.

Nostrils oblong, oblique, subbasal, nearly dorsal, open, with a process from the anterior margin, and placed in the fore edge of the cere. Eyes large, overhung by a thin projecting eyebrow; eyelids edged with bristly feathers. Aperture of the ear roundish, rather large.

Head broad, rather large; neck rather long and strong; body full and muscular, of great breadth anteriorly; wings long. Legs of moderate length, strong; tibiæ rather long, and muscular; tarsi short, rounded, covered anteriorly above with about seven broad plates, below with about twelve transverse rows of transversely oblong scales; toes strong, free, first and second of nearly equal size and thicker, fourth of about the same length but smaller, third considerably longer, the second capable of being turned inwards, all scutellate above, granulate and tuberculate beneath; claws large, curved, tapering, acute, convex above, rounded on the sides, flattish and narrow beneath, those of the second and first toes largest, that of the middle toe with an inner sharp edge, and internal flat surface.

Plumage compact, imbricated. Cere bare; space between the bill and eye sparsely covered with very small narrow feathers, having distant disunited barbs. Feathers of the neck narrow and pointed, of the back broad, of the belly very soft and downy, of the outer part of the tibiæ elongated. Wings very long, broad, rounded,

the fourth and fifth quills longest; the primary quills broad, tapering, but rounded at the end; the secondary broad and rounded. Tail of moderate length, rounded, of twelve broad feathers.

The genus *Haliaetus*, of which our own White-tailed Sea-Eagle, *H. Albicilla*, the White-headed Eagle of America, *H. leucocephalus*, and the White-bellied Eagle of Australia, *H. leucogaster*, are the most characteristic species known to me, is composed of large birds, organized for rapine, but also content to live occasionally on carrion of all kinds. They frequent the shores of the sea, rivers, and lakes, and feed on the fish which they find dead, or which they catch in shallow water. The American species robs the fish-hawk, *Pandion Haliaëtus*, in the same manner as the birds of the genus *Lestris* rob the smaller gulls and terns. In this respect, therefore, as well as in the comparatively elongated form of the bill, the genus *Haliaëtus* approaches, although distantly, to *Lestris* and *Cataractes*, which, with *Tachypetes*, seem to unite the web-footed birds with the vultures, eagles, and hawks. There is also a striking resemblance between the bill of *Haliaëtus Albicilla*, and that of the large gulls and the albatross, and these birds are to some extent allied in their habits. On the other hand, its affinity to *Aquila* and *Pandion* is so direct, that the species of the three genera form a gradual passage into each other. The Brazilian Eagle, *Polyborus*, and some other groups, form the transition to the vultures; and the Serpenter-eater of Africa, *Gypogeranus*, looks like an eagle elevated on the long legs of a crane. The habits of the

American species are fully detailed and beautifully described by Wilson and Audubon, men whose merit is not that of having attained dexterity in copying and patching; and the following account of our own is, if less animated than their descriptions, yet, I believe, more circumstantial than any hitherto published. The Bird of Washington, of the last mentioned eminent observer, seems to be a distinct species of this genus; but although superior in size, it is too nearly allied to *H. Albicilla*, to be generally admitted as such, until living individuals or skins of it can be shewn; and, in fact, differs little in appearance from a young bird of that species, of which specimens have been seen not much inferior to that represented in the "Birds of America." By some, *Haliaëtus* may be considered not sufficiently distinct from *Aquila*, to hold the rank of a genus; but the Sea-eagles, and the Eagles properly so called, certainly differ in their physiognomy, and ought to be distinguished either as genera or subgenera.

HALIAETUS ALBICILLA.

THE WHITE-TAILED SEA-EAGLE.

Of the adult male and female, the plumage of the head, neck, breast, and back, pale brown tinged with grey; of the abdomen and legs chocolate brown; the bill, feet, and irides, yellow. Of the young the plumage pale brown, with elongated spots of deep brown; the tail dark brown, irregularly variegated with white; the bill brownish-black; the irides brown; the feet yellow. The tips of the folded wings reaching to the end of the tail.

MALE.—This species, the only one of the genus that occurs in Britain, where it is known by the names of Erne, Cinereous Eagle, Sea Eagle, and White-tailed Eagle, is a bird of great size, robust constitution, and imposing aspect, although less elegant than the Golden Eagle, and inferior in courage and activity to many of the smaller species of the tribe. The bill is more elongated than that of *H. leucocephalus*, with the tip less prolonged; but its general form may be sufficiently understood by referring to the generic character in the preceding pages.

The space between the bill and the eye is sparsely covered with feathers consisting of a shaft, downy at the base, and prolonged into a hair. The feathers of the head are of ordinary length, of the neck rather long, all oblong-lanceolate, loose at the margin, but distinct; those of the back, wings, and breast, are large,

compact, distinct, ovate, rather obtuse, the posterior ones more elongated; on the belly they are soft, downy, and with the plumule as large and tufty as the feather. The tarsi, which are feathered for one-third of their length, have seven scutella, with twelve inferior series of scales; the middle toe with thirteen scutella. The wings, which when closed are of equal length with the tail, are very long and broad, the fourth and fifth quills longest, the second and third equal, and nearly as long, the first of moderate length; the first, second, third, fourth, fifth, and sixth abruptly cut out on the inner webs; the primaries tapering towards the end, the secondaries broad and broadly rounded. The tail is rather short, broad, and rounded, of twelve broad acute feathers.

The cere and bill are pale primrose-yellow; the iris bright yellow; the tarsi and toes gamboge; the claws bluish-black. The general colour of the head, neck, breast, back, and upper wing-coverts, is pale greyish-brown, the hind part of the back passing into wood-brown; the belly and legs are chocolate-brown, as are the lower tail-coverts and rump-feathers, some of the upper tail-coverts being white. The primary quills and alula are blackish brown; the base of the primaries and the greater part of the secondaries tinged with ash-grey. The tail is white, but a small portion of its base is deep brown.

Length 3 feet, extent of wings 6 feet 6 inches; bill $3\frac{1}{2}$ inches along the back, $2\frac{1}{2}$ to the tip of the lower mandible, $1\frac{1}{2}$ in depth; tarsus 4, middle toe and claw $5\frac{1}{8}$.

FEMALE.—The female differs in no perceptible de-

gree from the male in external appearance, and her superiority in size is less than is usual in this family, the difference being much smaller, for example, than between the male and the female of the golden eagle.

Length 3 feet 2 inches, extent of wings 7 feet; bill $3\frac{3}{8}$ long, $1\frac{1}{2}$ deep; tarsus 4, middle toe and claw $5\frac{1}{4}$.

VARIATIONS.—The colouring varies considerably, old birds only being as described above, while the younger are darker. The size also differs very materially. The extent of wing of an individual which I examined in Harris was seven feet four inches, but the largest that I have seen was in South Uist; and it was said by its proprietor, Mr Munro, the minister of that parish, to measure 9 feet between the tips of the wings. The changes which the feathers undergo as they become old are not remarkable, the tints merely becoming fainter, and the tips and margins lacerated.

HABITS.—With the name of the eagle we commonly associate magnificent ideas of moral grandeur and physical energy; and similar attributes we are accustomed to give to persons who have displayed qualities resembling those of the king of birds. But when the character of many of those individuals is carefully examined, we too often find it less estimable than it at first seemed; and, in like manner, an attentive observation of the habits of the species here described, has induced me to dissent in several particulars from the popular opinion respecting it.

If magnitude, strength, and rapacity, constitute nobility, the White-tailed Eagle is a noble bird; but if

courage and daring be considered essential to the pre-eminence designated by that term, it has little claim to the title. Its character is a compound of those of the vultures, the hawks, the raven, and the larger gulls. Its principal nutriment is derived not so much from the produce of its own industry as from carrion of all kinds; and it is frequently seen sweeping along the sides of mountains and hovering over the shores, in search of dead sheep, fish, young birds, and such animals generally as are large enough to furnish a meal, weak enough to make no formidable opposition, or so heavy as to be incapable of very rapid or protracted flight. It sometimes carries off poultry that have straggled to a distance from the house, clutches up young lambs, and when hard pressed by hunger is said to attack sheep and even deer; but a fox, an otter, or a seal, it scarcely ever ventures to molest, and a man may carry off its young before its face with little danger of a scratch.

When standing, its postures are by no means graceful; but the keenness of its bright and fierce eye enlivens its appearance, and under excitement it throws itself into beautiful and picturesque attitudes, drawing back its head, and erecting the narrow and pointed feathers of the neck. With its body inclined, its neck drawn in, its large heavy wings drooping by its side, it reminds us, when in a state of repose, of the vultures, with which it was in fact associated by Linnæus; and it may sometimes be seen on the pinnacle of a rock, with its wings spread out to the sun, somewhat in the manner of those carrion birds, to which it is allied in its habits as well as in its postures. But this hanging

out of the wings to dry, or to be aired, as one may say, is not peculiar either to vultures or to eagles; for the cormorants and shags, on the rocks around the haunts of the latter, very frequently employ it. If the Frigate Bird uses the same attitudes, this would furnish an additional proof of the affinity of the genera *Tachyptes* and *Carbo* to *Cathartes*. In rising from the ground, it throws itself forward, flaps its extended wings repeatedly, striking their tips against the ground before it gets fairly on wing, when, after a few more flappings, it assumes a steady and vigorous flight, or soars away, wheeling in large circles. Owing probably to this difficulty of raising itself on wing, it seldom alights on plain ground for the purpose of resting, but usually settles on a large stone or block, the pinnacle of a rock, or the edge of a precipice. The case is different, however, on an extensive sand, and in Harris I have several times seen it resting in such a place; for there it can make its escape from its enemies without experiencing any danger. Once, when two eagles of this species had alighted on the sands of North Town, not being able to get nearer them than a bank at the distance of five hundred yards, I resolved to give them a fright at least, and putting a double charge of powder in my musket let drive a ball between them. I saw it hit the sand near them, when they got up in all possible haste, and moved off in silence. In such circumstances, however, I believe a person might sometimes get within shot, by running up at his utmost speed, as I have myself successfully done in the case of the Brent Geese, which rise much more easily.

When it is fairly on wing, its motions are beautiful in

the highest degree. Its wings are expanded to their full length, forming an obtuse angle with the back; and as it sweeps along in wide curves, it seems to glide through the air without the least effort, and with very little motion of the wings or tail. The feet are drawn close to the abdomen, and concealed among the feathers, and the neck is retracted to such a degree that the head seems stuck upon the shoulders. In this manner it searches the hill sides, the moors, and the shores; but in proceeding to a distance, without regarding the intermediate space, it flies in a straight line, always at a great height, and with regular flaps, somewhat in the manner of the raven.

It utters a loud shrill scream, which in calm weather may be heard at the distance of more than a mile, and when angry, as well as on various occasions, emits a noise, somewhat resembling the yelping of a dog, which may be imitated by the syllables *kooluk*, *kooluk*, *klook*, *klook*.

I have seen it sailing slowly over the sea, apparently on the look-out for fishes, which it is said occasionally to seize as they approach the surface; and it is sometimes observed watching by a lake or stream for salmon or trouts, which it secures in shallow water. My friend Mr Bushnan of Dumfries mentions, in his Introduction to the Study of Nature, an occurrence connected with this habit. "Some years ago, a large salmon was found dead, and an immense eagle drowned beside it, with the claws of the one stuck into the back of the other, upon the banks of Moffat Water. A few days before, a party of young men had started on a Sunday night to spear salmon by the light of a blaz-

ing torch ; Moffat Water, from its general shallowness, and the nakedness and general character of its banks, offering unwonted facilities for this sport. The parties had scarcely begun to search the pools, when they were astonished with the strange noise that came ' splash, splash,' upon them ; and soon a huge pair of wings appeared, magnified by the uncertain light, and accompanied with other startling and unearthly noises. The phenomenon floated past, almost among their feet ; and the young men terrified, and impressed with the idea that an apparition had appeared to warn them of the danger of misspending the Sabbath day, left their sport and returned home. The circumstance was kept a profound secret, until the discovery of the cause of the phenomenon relieved the youths from the fears which it had excited."

When it has young it provides abundantly for them, and instances have occurred in the Hebrides of people obtaining an additional supply of food, in times of scarcity, by climbing or rather descending to its nest, which is generally nearer the summit than the base of the cliffs. I have never heard of its attacking a person when robbing its nest ; but I have been credibly informed of two serious assaults made by it on individuals whom it found in a perilous situation. A man, in the Island of Lewis, having crept to the edge of a shelf overhanging the nest of an eagle, was waiting the arrival of the birds, for the purpose of shooting them, when one of them sweeping silently along the top of the cliff, struck him unawares with its wing, although without producing any other effect than giving its enemy a sound fright. Among some rugged crags at the lower end

of Loch Suainebbhad, in the same island, a pair of these birds annually rear their young. A woman, who had been in the moors looking after cattle, was descending the rocks by a difficult path, when the two eagles attacked her with great fury. She defended herself, however, in the best manner she could, and escaped with some severe scratches and the loss of her cap.

On observing a person walking near their nest, they fly around him at a respectful distance, sailing with outstretched wings, occasionally uttering a savage scream of anger, and allowing their legs to dangle, with outspread talons, as if to intimidate him. I have observed them thus occupied, when on the edge of a precipice five hundred feet high, with a very steep slope above me, bounded by rocks, and from which I could not have made my escape had the birds been resolute. Although on such occasions they are in general extremely cautious, notwithstanding their manifest anxiety for the safety of their young, yet I once saw an eagle come within an hundred yards, when it was brought down with buckshot by a friend whom I had accompanied to the place.

In the Hebrides, the raven is perpetually harassing the eagle, which its superior agility enables it to do with safety, although I have never seen it venture to come into actual contact with its powerful adversary. The hooded crow, which is also very common there, never, I believe, makes even a shew of opposition to the eagle; and I have not seen any other bird molesting it, unless it might be its brother the golden eagle. But in Shetland, according to Mr Drosier, the skua or bunxie no sooner sees the eagle within its domains than

it commences a most violent attack upon him. "I was particularly amused one evening," says that gentleman, in Loudon's Magazine for July 1830, "when standing at the foot of the loftiest hill (in Foula), called by the natives Snuge, with the following circumstances:— An eagle was returning to his eyry, situated on the face of the western crags, in appearance perfectly unconscious of approaching so near to his inveterate foe, as, in general, the eagle returns to the rocks from the sea, without ever crossing the smallest portion of the island. This time, however, he was making a short cut to it, by crossing an angle of the land. Not a bird was discernible: a solitary skua might indeed occasionally be seen, wheeling his circling flight around the summit of the mountain, which was already assuming its misty mantle. As I was intently observing the majestic flight of the eagle, on a sudden he altered his direction, and descended hurriedly, as if in the act of pouncing. In a moment five or six of the skuas passed over my head with astonishing rapidity, their wings partly closed and perfectly steady, without the slightest waver or irregularity. They appeared, when cleaving the air, like small fragments of broken rock, torn and tossed by a hurricane from the summit of a towering cliff, until, losing the power that supported them, they fell prone to the sea beneath. The gulls soon came up with him, as their descent was very rapid, and a desperate engagement ensued. The short bark of the eagle was clearly discernible above the scarcely distinguishable cry of the skua, who never ventured to attack his enemy in front; but, taking a short circle around him, until his head and tail were in a direct

line, the gull made a desperate sweep or stoop, and, striking the eagle on the back, he darted up again, almost perpendicular; when, falling into the rear, he resumed his cowardly attack. Three or four of these birds, thus passing in quick succession, invariably succeed in harassing the eagle most unmercifully. If, however, he turns his head previously to the bird's striking, the gull quickly ascends without touching him. This engagement continued some time, the eagle wheeling and turning as quickly as his ponderous wings would allow, until I lost the combatants in the rocks. As soon as this is the case, the gulls leave, and quietly return to the mountain." I have seen eagles fighting in the air; their motions were then beautiful, and displayed considerable agility. When the higher one approached the other, the latter threw itself on its back, and received the foe with extended talons. Their shrill screams filled the air to a great distance.

The usual mode of destroying eagles in the Hebrides is the following. In a remote part, generally on an eminence, the declivity of a mountain, or the margin of a precipice in which eagles breed, a pit, about six feet in length and three in breadth, is dug to the depth of two or three feet. The turf removed from it is arranged as a wall, so as to deepen the pit a foot or two more. Some sticks are then laid across it, together with heath, and the whole is covered over with fresh turf taken from some distance. An opening large enough to admit a person is left at one end, and at the other is formed an aperture about six inches in diameter. The door is closed by a bundle of heath; and in this state the pit or hut is left until all traces of labour

are effaced from it by the weather, and the keen eye of the eagle, as he sails over it, can distinguish nothing but a tuft of heath similar to those around. A carcass is then procured, a sheep that has been found dead on the hills, or an old and useless horse that has been taken out and killed for the purpose. It is placed at the distance of fifteen or twenty yards from the hut, so as to be visible from within through the small aperture. The hunter enters, spreads a layer of heath on the floor, closes the entrance behind him by pulling into it the bundle, lays him down on his side, places the muzzle of his gun in the aperture, and prepares for a tedious watch. Hours often pass, and yet no bird makes its appearance. Heavy rains descend, penetrate the roof, and leave him in a very uncomfortable state; or he is chilled by the piercing winds of winter. He is every now and then surveying the few yards of ground before him with an impatient eye. At length he hears a well-known voice, and presently perceives on the nearest eminence a large raven, which looks anxiously around, and croaks, then hops forward a step or two, rises on wing, and alights on the carcass. Here it again looks round for a few moments, and commences its feast, first devouring the eye, then the tongue, if it can get hold of it, and, lastly, picking under the tail. Another raven appears, and frequently many in succession; but as the hunter knows not how near the eagle may be, he refrains from shooting, or even disturbing them. Sometimes a gull of the large black-backed species, or a burgomaster, or even a herring gull, appears with its unsullied white plumage, and walks anxiously about, but does not dare to attempt a

participation of the feast so long as the ravens remain unsatisfied. They, meanwhile, have torn open the abdomen, and are tugging at the viscera. At length hurried noises are heard from the carrion birds, which look around in an anxious manner; the rushing as of a current of air comes on the ear of the *lier-in-wait*, who brings his gun to his shoulder; and, as the birds disperse, he sees the eagle quietly seating itself on the carcass, gathering up its large wings, and preparing to commence the banquet. Now is the time—now, or never. Forth rushes the little shower of buck-shot, the terrified gulls and ravens fly off, screaming and croaking, and the author of their panic, kicking out the bundle of heath from the door of the hut, drags himself into open day, and runs up to the carcass, on which is stretched the once formidable skimmer of the clouds, now vainly struggling in the agonies of death. He admires the expanded wings and large yellow beak of his prey, returns for his trusty gun, throws the dead eagle on his back, and leaves the carrion to the ravens, until another dawn sees him enter the hut of the moors. I have known a shepherd kill five eagles in this manner on one farm in the course of a winter; but frequently the carcass is devoured by the ravens and gulls without the occurrence of a single eagle. The hooded crow also occasionally makes its appearance, but this bird is less bold and less carnivorous than its sable kinsman. A small premium is usually given by the factors or land-stewards for every eagle killed; and I should imagine there cannot be fewer than twenty annually destroyed in the Outer Hebrides. But a more animating scene presents itself:—

Why flames the far summit? Why shoot to the blast
Yon embers, like stars from the firmament cast?
'Tis the fire-shower of ruin all dreadfully driven
From his eyry.'

The farmer, breathing vengeance for the massacres perpetrated upon the young lambs in spring, has assembled his shepherds and cottars. They proceed, one carrying a coil of rope, another a bundle of dry heath, and a third a burning peat, toward the further brow of the mountain, where the fissured and shelved precipice hangs over the foamy margin of the Atlantic. Far in the west, in misty and melancholy grandeur, rise the lone isles of St Kilda. The great ocean is spread around, its impetuous currents sweeping along the rugged shores. Strings of gannets, cormorants, and guillemots, are seen winding round the promontories; while here and there, over the curling waves, is seen hovering a solitary gull. They have reached the brink of the cliffs, over which the more timid scarce dare venture to cast a glance, for almost directly under their feet is the unfathomed sea, heaving its heavy billows some hundred feet below the place to which they cling. The eagles are abroad, sailing at a cautious distance in circles, uttering wild and harsh screams, and, as they sweep past, displaying their powerful talons. One of the men fastens the rope to his body, passing it under his arms and securing it upon his breast by a firm knot. The rest dig holes with their heels in the turf, and, sitting down in a row, take firm hold of the cord. The adventurer looks over the edge of the cliff, marks the projecting shelf which overhangs the eagle's nest, and is gradually lowered towards it, bearing in one

hand the bundle of heath, with a cord attached to it, and the peat burning in the middle, and with the other pushing himself from the angular projection of the rock. At length he arrives on the shelf, and calls to those above to slacken the rope but keep fast hold of it. Then, creeping forwards, and clinging to the unstable tufts of *Statice Armeria* and fescue, he looks downwards, and ascertains the precise position of the nest, in which are two eaglets covered with down, skeletons of fishes, birds, and lambs, lying heaped around them. At sight of the human face, which to their imagination is any thing but divine, the young eagles shrink back in terror, cowering beneath the projecting angle that partly roofs the nest. Their enemy now retreats, disposes the bundle of heath in a loose manner, blows the peat into a flame, and partially encloses it. Once more he approaches the brink, casting an anxious eye towards the old eagles, which are wheeling in short circles, and uttering confused and piercing cries; then, blowing the flame, kindles the bundle of combustibles, and rapidly lowers it right into the nest. The young birds scream and hiss, throwing themselves into attitudes of defence. The heath smokes and crackles, and at length blazes into full flame; then the sticks, seaweeds, wool, and feathers, of the nest catch fire, and the ascending column of smoke indicates to the ropemen above that the deed is doing. Flames and smoke conceal the young birds from the avenger's gaze, but he stirs not until they have abated, and he sees the huge eyry with its contents reduced to ashes. He then calls to his friends, who tighten the rope, and preparing himself for the ascent, is hauled up, encountering no small dan-

ger from the fragments which are loosened by the cord, and the difficulty of keeping his face and breast from the ragged points that project from the cliff. Birds have feelings as well as men, and those of the eagle are doubtless acute, for the old birds wheel and scream along the face of the rock for many days in succession, and as by this time the summer is far advanced, they form no new nest.

When the eyry is more directly accessible, a person may descend into it and destroy its contents. Sometimes it is so placed that a good rocksman might make his way to it without the aid of a rope; and I had two eaglets which were removed from the nest in this manner by my father's shepherd. I myself, not the most intrepid clamberer in the world, have been within three yards of an eagle's nest, and have seen the old bird gazing upon me as I carried my head over the edge of a precipice, several hundred feet in height.

Unless in the breeding season, eagles usually fly in pairs, and, unless for some weeks after the young come abroad, it is rare to find more than two together. At the commencement of the breeding season, three may be seen in mutual proximity, but in this case two of them are bent on hostilities; and when carrion is on the hill, or on the shore, from two to five may be occasionally observed, but I do not remember to have ever seen more than the latter number together; whereas of ravens, birds which usually go in pairs, hundreds sometimes collect to feast upon a stranded animal of the cetaceous family.

There seems to me no reason for believing that this eagle has a very acute sense of smell, especially as

it is not aware of the person who lies in wait within twelve or fifteen yards of it. Its vision must be very penetrating, otherwise it could not so readily fall upon a carcass on the hills, or a dead fish on the shores, from the great height at which it often soars. In searching for food it usually, however, sweeps along the mountain's sides at a height of only a few hundred feet.

Eagles are said to be particularly fond of dogs, that is, I presume, when they find them dead, which must be seldom the case; and are reported by the shepherds as sometimes carrying off stray cats, which in the Hebrides often run wild in the hills during the summer season, and return towards the end of autumn. They do not venture to attack an otter, when they find one eating a fish, but stand at a short distance. This species, in fact, is decidedly cowardly, although in captivity it becomes vicious, and does not hesitate to attack a dog, a child, or even a grown-up person. I have seen a young bird lay hold of a girl who was carrying off a piece of flesh in her hand, and an old one make a very confident attack upon a boy who was passing near it. This latter bird, which was confined in a large room, under the old library of the University of Edinburgh, once clutched me in the shoulder, but did no material damage. It would seem that with many birds, as well as quadrupeds, familiarity with man tends to lower the estimation in which he had previously been held, or at least to obliterate in a great measure the awe with which he is regarded by the same animals when they are not compelled to associate with him. The wolf and the hyena resemble the eagle in this respect.

In almost every district in the Highlands stories are told of eagles that have carried away infants temporarily left by their mothers in the harvest field or elsewhere ; and it is probable that such an occurrence may have taken place, although the evidence is usually imperfect. Sir Robert Sibbald states, that in Orkney " an eagle seized a child, a year old, which its mother had left, wrapped up in some clothes, at a place called Houton-Head, while she went for a few moments to gather sticks for firewood, and carried it a distance of four miles to Hoia ; which circumstance being known from the cries of the mother, four men went there in a boat, and, knowing where the nest was, found the child unhurt and untouched." Wilson, the ornithologist of America, gives an account of a feat of this kind which a white-headed eagle had attempted. " A woman who happened to be weeding in the garden, had set her child down near to amuse itself while she was at work, when a sudden and extraordinary rushing sound, and a scream from her child, alarmed her, and starting up, she beheld the infant thrown down, and dragged some few feet, and a large bald eagle bearing off a fragment of its frock, which being the only part seized, and giving way, providentially saved the life of the infant." This happened near Great Egg-harbour, in New Jersey.

The white-tailed eagle, judging it from the form of its bill and claws, and from its general structure, must be essentially a bird of prey ; but in the Hebrides it is in reality more of a carrion bird. Hares and rabbits, roes, and other weak or timid animals, it may attack in other districts ; but there it has small scope for plun-

der, at least among quadrupeds, excepting in the article of lambs. It, however, destroys grouse, young sea-birds, and sometimes poultry. Whether two individuals ever hunt in concert, as Mr Audubon says is the case with the white-headed eagle, which is so closely allied to it, I know not; but at Luachar, in Harris, a shepherd told me he had seen two attacking a doe in winter. The eagles hovered over the frightened animal, when one of them descended, pounced upon its shoulder, and struck at its head with its wings. It then sprung up, and the other eagle took its place. The deer was stunned, became confused, staggered, and would probably have fallen a victim, had not the shepherd shouted from the place where he had lain concealed, when the eagles flew off, and the deer, soon recovering, bounded away.

Of the many absurd stories told of eagles, the following, by the justly celebrated geologist Von Buch, is not the least remarkable. "We learned," says he, "with astonishment, that eagles were very much dreaded on these islands; for they are not contented with lambs and smaller animals, but even attack oxen, and not unfrequently master them. The manner of their attack is so singular that we should have doubted the truth of the account if we had not heard it so circumstantially and distinctly confirmed to us, in the same terms, at places a great distance from each other. The eagle plunges itself into the waves, and, after being completely drenched, rolls itself among the sand on the shore till its wings are quite covered with sand. It then rises into the air, and hovers over its unfortunate victim. When it is close to it, it shakes its wings, and

throws stones and sand into the eyes of the ox, and completes the terror of the animal by blows with its powerful wings. The blinded oxen run about quite raving, and at length fall down completely exhausted, or dash themselves to death from some cliff. The eagle then mangles, undisturbed, the fruits of its victory." If this tale be true, the Norwegian eagles must be very different from ours in courage and sagacity; for the British eagles, in so far as I have seen, are so cowardly that they do not even venture to defend their nests against a solitary rocksman, dangling upon a rope like a spider upon a thread, and so weak, or rather so unable to rise with speed, that they seldom attempt to carry off a lamb unless in windy weather, and from an eminence. But as to eagles plunging into the waves with the view of getting drenched, in order that sand might adhere to their draggled plumes, and then flying off to blind oxen with it,—this requires to be established by respectable witnesses before it can be credited.

My friend Mr Forbes has favoured me with some interesting particulars relative to the history of the eagles which occur in the Orkney Islands. There are two species, he says, in that country, the White-tailed or Cinereous Eagle, and the Golden or Ring-tailed Eagle. Of the white-tailed the following breeding places are known:—White Breast, Dwarfie Hammers, and Old Man, in Hoy; South Ronaldshay and Costa Head, in Mainland. Of the golden eagle:—Snook, to the east of Rackwick, and a rock to the west of the same place, in Hoy; and the Meadow of Kaimes.

Some people were out fishing in a boat near the

Black Crag of Stromness, when an eagle came sailing slowly along. A hawk (probably the goshawk) was observed to launch suddenly from the rock and strike the eagle, when both birds fell into the sea. The eagle was quickly dispatched by the boatmen, but the hawk, in consideration of his bravery, they intended to treat in a different way. Finding, however, that he had broken his wing with the force of the blow, they laid him upon a shelf of the rock, with a piece of a fish beside him; but on visiting the place next day, they were disappointed to find that the bird had disappeared, having probably fallen into the sea.

The clergyman of Hoy was walking near his house, when he heard the squeak of a pig, which excited his attention, as he kept none of these animals. On looking about him he perceived an eagle sailing away to Hoy Head with a young grunter in his talons; on which he tossed up his hat, but the bird took no notice of it. On inquiring among his neighbours, he found that the pig had been taken from one of them, and was just four weeks old. This circumstance, Mr Forbes says, may give some countenance to the story of a young child's having been carried off by an eagle in Orkney many years ago.

The following occurrence took place in Hara, Mainland of Orkney. An eagle, bearing away a hen, chanced to pass over a house, in the vicinity of which was a sow with its litter. Thinking a nice fat pig a better prize than the hen, the eagle dropped the latter and attacked the pigs, but to no purpose, for they ran up to the old sow, which defended them courageously and effectually. In the mean time the hen

made her escape to the house. The eagle, having forgotten that "A bird in the hand is worth two in the bush," was obliged to spread his sails, and move off with a disappointed maw. The hogs which run wild on the hills of Hoy, when attacked by dogs, defend themselves by collecting and forming a circle, and in this manner present an armed front in all directions to their antagonists.

Pig-styes are made in the hills with turf, of a conical form, with a hole at the top. A pig happened to be left in one by mistake, and, being unable to get out, died in due time. An eagle passing over the stye, peeped in and spied the carcass, upon which he descended through the hole and feasted to his content. This eagle, like the mouse in the meal-tub, had forgotten that one may sometimes get into a place without being able to get out again; and so it fared with him, for he was taken alive and executed as a felon.

In the Statistical Account, vol. xxi. p. 221, eagles are said to be frequently destroyed in Sutherland in the following manner: "A miniature house, at least the wall part of it, is built on ground frequented by the eagle, and an opening left at the foot of the wall sufficient for the egress of the bird. To the outside of this opening a bit of strong cord is fixed, with a noose formed on one end, and the other end returning through the noose. After all this operation is finished, a piece of carrion is thrown into the house, which the eagle finds out and perches upon. It eats voraciously; and, when it is fully satiated, it never thinks of taking its flight immediately upwards unless disturbed, provided it can find an easier way to get out of the house; for

it appears, that it is not easy for it to begin its flight but in an oblique direction; consequently, it walks deliberately out at the opening left for it, and the cord being fitly contrived and placed for the purpose, catches hold of, and fairly strangles it."

Everest, in his "Journey through Norway, Lapland, &c." has the following remarks on the eagle, which he compares with the gyrfalcon, much to its disadvantage: "There are many eagles here; but an eagle, till you come close enough to him to feel the full force of his eye, is, I should be bold enough to say, a mean-looking object, if there were not so many assertions to the contrary. The peculiarity in the shape of his wing, which has the third and fourth quill-feathers longer than the first and second, deprives him of that beautiful arch which so many of our common birds possess, and makes him appear at a distance like a large raven. His rising from the ground is laboured, and his flight as sluggish as that of the common heron or barn-owl. When he flies across you, at a short distance off, you are struck with his great size, the vast muscular power of the upper joint of the wing, and the sweeping breadth of it. Gray, with truth, called it an ample pinion. I have never seen them soar so high as the large black-backed and herring gulls." From what I have already said, it has been seen that I agree with Mr Everest in several particulars of the above account; but others of it I cannot but consider incorrect. I have a hundred times seen the eagle rise in the air, so as to attain an elevation at which he was with difficulty perceptible. The same phenomenon every one has seen exhibited by the lark; but it may easily be supposed how much

greater the elevation of a bird, eight feet from the tip of one wing to that of the other, must be, when it presents a mere speck to the eye, than that of a bird not many more inches in extent, under the same circumstances. Nor is the eagle "a mean-looking object" under any circumstances. His motions indeed are not so rapid as those of a small hawk, just as the motions of an elephant are less rapid than those of a mouse; nor is his courage equal to that of the hobby. And well it is that such is the case; for, had the elephant the courage and activity of the weasel, no animal large enough to attract his notice could live within twenty miles of him. From a flat surface an eagle rises with great difficulty, and not until after repeated flappings of its wing, but in the air it exhibits great facility of motion. Nothing can be more beautiful than the majestic sweep of an eagle, while passing along the sides of the mountains in search of prey; but the pleasing effect which such a sight has upon us, is not dependent solely upon the velocity or elegance of motion displayed, for in both respects the swallow greatly excels the eagle, without affording us equal delight.

Although this species has been named the Sea-Eagle, and is supposed to be peculiarly maritime, I have picked up some of its feathers on the granite cairn on the summit of Loch-na-garr, in Aberdeenshire, more than forty miles inland; and Mr Mackenzie, the Earl of Fife's forester, informed me, that both this and the Golden Eagle occur in the Braemar district. On an island in Loch Skene, in the high range of greywacke hills on the confines of the counties of Dumfries, Peebles, and Selkirk, a pair used to breed not many

years ago ; and in a few places in Galloway, individuals still occur, according to the statement of Mr Macdermid, who, in his "Sketches from Nature," has given an interesting description of the eagles of that region.

The distribution of this bird in Scotland is daily becoming more limited. In the Outer Hebrides, Skye, Mull, Rum, many of the other islands, and in most parts of the northern division of the country, it is still pretty numerous. In the western part of the middle division, and here and there in the Grampian range, it occurs in diminished numbers ; but in the southern division it has been almost extirpated. Mr Bushnan, writing in 1834, doubts whether a pair of eagles is to be found wild in Dumfriesshire, or more than a dozen in Galloway, between the Nith and the Mull.

PROPAGATION.—The White-tailed Sea-eagle begins to prepare its nest some time in March. It usually places it on a shelf of some vast cliff overhanging the sea, or in the cleft of a rock in the inland solitudes, sometimes on rocks by the margins of lakes, and more rarely still in islands on lakes. I have seen two of its haunts in Harris, in rocks not forty feet high, and one on a flat island in a small lake ; but, in general, it is careful to choose as inaccessible a retreat as possible. The diameter of the nest is about five feet, and it consists of sticks, heath, sea-weed, and other materials of a like nature, arranged in the same slovenly manner as the straws in a hen's nest, together with grass, wool, and feathers. The central part of the nest is but slightly hollowed. There are generally two eggs, sometimes only one, but I never heard of three ha-

ving been found in the Hebrides. They are about the size of those of a goose, but shorter, and of a yellowish-white colour, with a few reddish dots at the large end. They do not appear to be left exposed at any time; at least, on going to the neighbourhood, as I have often done, I have always found the bird upon the nest; hence it is probable that the male sits when the female is absent. So close indeed does the eagle sit during incubation, that I have seen four shots fired at one seated on her eggs, at the distance of about two hundred yards; nor did she stir until the last ball hit the rock within a very few inches of her head. The young are hatched about the beginning of June, and are fed with fish, carrion of all kinds, grouse, and other birds, until the middle of August, when they are fully fledged. They are at first covered with down of a whitish colour, and present a curious appearance.

YOUNG BIRD FLEDGED.—The bill is deep-brown tinged with blue; the cere and base greenish-yellow; the iris dark brown; the feet gamboge; the claws blackish brown. The head is deep brown, approaching to umber; the bases of all the feathers of the body white; on the hind neck, the whole feathers of that colour excepting the ends, which are deep brown; this part, in consequence, appears spotted with white. The anterior and middle part of the back is light brown, the tips of the feathers umber. Primaries brownish-black; tail greyish at its origin, deep brown, with an irregular brownish-white patch along the inner webs. Fore-neck, and anterior part of breast, brownish-white, spotted with umber; tibial region brown; lower tail-coverts whitish, tipped with deep brown.

PROGRESS TOWARDS MATURITY.—The principal changes which take place in regard to colour, as the bird advances, are these. The bill first becomes bluish-black, but ultimately yellow; the cere becomes brighter; the iris assumes more of yellow; the white at the base of the feathers gradually disappears; the tail becomes lighter, at first patched with white, and ultimately of that colour entirely. The general colour of the plumage after the first moult is darker than at first, but at each successive change it becomes paler. At the age of two years the bird is of the following colours.

Bill bluish-black, brownish at the tip of the upper mandible, and along the greater part of the lower, yellowish at the sides of the base; cere greenish-yellow; irides darkish-brown. Head and hind-neck dark-brown, the latter still marked with white; fore-neck and breast brownish-white, longitudinally marked with deep brown. Upper parts in general pale brown, patched with deeper, some of the scapulars glossed with purple. The hind part of the back is white, the tips of the feathers umber; the tail-coverts brownish-grey. Base, outer webs, and tips of tail-feathers, deep brown; inner webs and part of outer near the tip brownish-white. Belly pale brown, spotted with umber. Tibial feathers brown; lower tail-coverts white, tipped with deep brown. Primaries brownish-black; secondaries greyish-brown. Feet gamboge-yellow; claws bluish-black, tinged with brown.

In the young plumage, the white-tailed sea-eagle very much resembles the white-headed species in the same state; although, when the birds are placed together, the differences are obvious. The brown tints of the American species are much darker than those of ours,

and the differences in the form of the bill, with that in the size of the birds, and the greater length of the tail compared with the wings in the former species, are of themselves sufficient to enable one to distinguish them; although Wilson confounded the young of the white-headed eagle with the sea-eagle of Europe, the young of the present species.

REMARKS.—The younger birds were, until of late years, considered as constituting a species, which was called the Sea Eagle, *Falco Ossifragus*; and the full-coloured old birds another, bearing the name of Cinnereous or White-tailed Eagle, *Falco Albicilla*. It was first shewn by Temminck that the two supposed species form in reality but one; and other authors have confirmed the statement. But as the question has long been settled, it is quite unnecessary here to attempt any display of learning connected with it; nor would there be any better reason for presenting a long list of synonyms and references, such as some authors, with small trouble and much pomposity, impose upon their readers.

I have already observed that this species, when kept in captivity, often becomes more ferocious with reference to man, than it is apt to be in the free state. The individuals which I have kept myself, were not allowed to live long enough to furnish any materials for these pages; and those which I have seen with other persons, both in the Hebrides, and in various parts of Scotland and England, I have merely attended to in so far as regarded their appearance and attitudes; but I am happy, through the kindness of my esteemed friend

Dr Neill, to whom many of the cultivators of every branch of Natural History are indebted for valuable additions to their store of information, for the following history of a beautiful bird of this species, which is at present, May 1835, in perfect plumage.

“ The eagle was presented to me by my friend Mr James Slight, in the autumn of 1827, when in immature plumage, or indeed scarcely fully fledged. He informed me that he had procured it at Cape Wrath, in Sutherlandshire, and that it had been taken from the eyry on the cliffs of that Cape in the summer of that year. Next season, 1828, it became generally of a dark brown colour, with a very few whitish spots about the tail. At the moult of 1829, the white colour of the tail-feathers became much more conspicuous, and the bird seemed altogether of a lighter brown. Mr Audubon saw the young bird at Canonmills in 1827, and again in 1834, when in adult plumage.

“ Having succeeded in keeping the bird in perfect health, though in confinement, for so long a period, I may mention the plan adopted. I had an octagonal wooden house, or large cage, built in the garden; its inside diameter being 9 feet, its walls $6\frac{1}{2}$ feet, with a sloping roof, rising nearly 5 feet higher in the centre. Three of the sides, opposite to a walk, and fronting the south-west, were composed of open spars or trellis-work, so as to admit plenty of light and air. In the middle of the floor we fixed a branched trunk of a small tree, so as to afford convenient perches for the bird. The food usually given has been fish of any kind, and bullock's liver, on alternate days. He is very fond of a piece of soft mild cheese, such as that called Dunlop

or Ayrshire,—necessarily an acquired taste. I have been in the habit of carrying a bit of such cheese in my pocket, to give to a Penelope and other birds, and to some land tortoises kept in the hot-house; and the eagle does not see me pass without uttering a peculiar call, intimating his desire to be remembered with a morsel, which he catches with much adroitness. When in the moult, and shying his food, we have sometimes successfully bribed him with a tidbit from the poultry market, such as a wild duck or a wood pigeon. On one occasion, lately, an unlucky pet hen made her appearance within the precincts of the cage, and was despatched in a very brief manner,—the feathers on the back of the eagle's head being raised as in irritation, and his eye evidently flashing with increased brightness as he tasted the warm blood. He has repeatedly killed rats that had been attracted by the offals of his food, and has generally devoured them excepting the head and tail. The village cats, when prowling about, often make incursions into the garden; and, being strangers, they sometimes venture to peep into the eagle's den; but the moment they perceive the bird's keen eye glancing at theirs, they skulk off in evident terror. He does not require the fish given as food to be very fresh, but will partake of haddocks or coalfish rejected by a pair of skarts (shags) and a solan-goose kept in an adjoining enclosure. We never let him want clean water in his trough; and this is made large enough to permit his bathing.

“ The bird is not ferocious, but allows the gardener to enter and clean out the cage without molesting him, or being alarmed at his presence. This cleaning has

generally been done once a-week, so that any offensive smell seldom occurs. He evidently knows his master, and the other members of the family. When strangers come upon him unawares and unattended, he seems much alarmed, sometimes springing up and striking the roof of the cage; but he is speedily pacified on the approach of any one with whom he is acquainted. This quality of being tractable, and forming familiarities, was very early observed in him. Mr Slight informs me, that 'the voyage from Cape Wrath occupied about a fortnight; during which, much curiosity was excited by the intimacy that took place between the bird and the sailor who had charge of feeding it, and he was the only person allowed to approach without interrogation.' This is an expressive phrase; for I know by experience that such squiline interrogation implies a severe blow by pecking with the bill, or sharp flapping with the wing. He uniformly shews dislike to a parti-coloured dress, and sometimes seems absolutely terrified at a lady who may happen to wear a blue or a pink bonnet. He has occasionally been allowed to wander out of the cage, but on these occasions he merely jumped about on the gravel-walk, without attempting to fly off or to escape, and was easily persuaded to re-enter his abode, or even seemed pleased to do so. We have observed for two or three years past that he becomes impatient and restless in March and April, and at that season calls very frequently and loudly, often during the night or early in the morning. The notes of periodical impatience are very shrill, and wildly vociferous; altogether distinct from those by which he endeavours to attract our attention to his wants, which are comparatively soft and of a coaxing character."

Dr Neill observes that he speaks of the bird as a *he*, without being positive as to the sex; and it would indeed appear probable, from various circumstances, particularly the rather small size of the bird, that this opinion is correct.

A beautiful live specimen, which had been caught, at Lochmaben, in a trap set for vermin, and was seen by me in Edinburgh, on the 30th April 1834; another old individual formerly belonging to Messrs Eagle and Henderson, and still in perfect health; and an old female, from Galloway, preserved in the Museum of the University of Edinburgh, are or were all in the same adult plumage as that of Dr Neill; and besides these I have examined three individuals in the Hebrides, and many others in museums; so that my description cannot fail to be tolerably correct.

But if "with all appliances and means," one can neither satisfy himself nor his readers that he has presented a faithful picture; what shall we say of those who having neither observed for themselves, nor possessing the power of distinguishing between the truths and errors of others, profess to instruct the public. Yet many such there are in these days of book-making. With the qualifications of the author of a professedly popular work on British Birds, I am not acquainted, and I should be sorry to say or do any thing to his disadvantage; but I feel myself compelled to use my pen against the statements contained in pages 112 and 113 of the first volume of the "Feathered Tribes of the British Islands," scarcely one of which is correct. Eagles, says he, "are in all respects the birds of the greatest elevation. They frequent more lonely

and secluded places than any of the others; they nestle in more elevated, wild, and inaccessible rocks; they rise much higher, and range much farther." Now, the condor, the lammergeyer, and other vultures, are in all these respects at least equal to the eagles; many birds frequent places as lonely and secluded as they, and many nestle in as elevated, wild, and inaccessible rocks. "They are much larger than any of the others." Verily, this is an assertion with a vengeance. The emeu, the cassowary, the swan, the albatross, the adjutant, and many other birds, are larger than any eagles known to me at least; and certainly these birds would far outweigh an equal number of eagles. The assertions respecting the superior strength of their bones, the toughness of their muscles, which "are as firm as pieces of cable," their very feathers which have a wondrous strength in them, &c., need no refutation. "Those winds which cleave the oak, and rend up the mountain pine by the roots, do not ruffle the plumage of the mountain eagle, &c.;" she being formed, no doubt, of molten lead, with her feet cramped and rivetted into the rock. "Floating hundreds of feet above the summits of our highest mountains, she spies a grouse or a mountain hare"—where you, my honoured reader, could hardly discern an elephant! "Even the swiftest-winged hawks keep at a distance from the retreat of the eagle,"—although the peregrine, the goshawk, the skua, and the raven, find it amusing to skirmish with him; and, oh sublimity of climax! "when her shadow passes over the valley, not a wing moves but her own;" although, having been many times in valleys and on hills, and even precipices, under or near

the shadow of eagles' wings, I never observed the least difference in the actions of the birds around me, unless one of them might fly off to harass the great lubber above; for the lark soared as usual, the mavis sung, the pipit fluttered, the plover whistled, and the rock-dove cooed, as if nothing were the matter, while slanting from the neighbouring cliff would perhaps sweep down the raven, croaking in fierce anger, to drive away the hated tyrant.

The names given to this species in different parts of the country are the Erne or Earne, the White-tailed Eagle, and the Sea-Eagle. By ornithologists, the old bird has also been called the Cinereous Eagle. In the Hebrides and Highlands, the old bird is named *an Iolair ghlas*, the Grey Eagle, and the young *an Iolair riamhach*, the Striped Eagle.

The species of which I have attempted to sketch the history in the preceding pages, is that mentioned or described by Linnæus, Latham, Montagu, M. Temminck, Mr Selby, and Dr Fleming, under the names, and in the works, indicated below.

- Vultur Albicilla. *Linn. Syst. Nat.* vol. i. p. 123. Adult.
 Falco Ossifragus. *Linn. Syst. Nat.* vol. i. p. 124. Young.
 Falco Albicilla. *Lath. Ind. Ornith.* vol. i. p. 9. Adult.
 Falco ossifragus. *Lath. Ind. Ornith.* vol. i. p. 12. Young.
 Cinereous Eagle. *Mont. Ornith. Dict.* Adult.
 Sea-Eagle. *Mont. Ornith. Dict.* Young.
 Aigle Pygargue. Falco Albicilla. *Temm. Man. d'Ornith.* p. 42.
 Cinereous Sea-Eagle, *Haliæetus Albicilla.* *Selby, Illustr.* vol. i.
 p. 13.
 Aquila Albicilla, The Erne. *Flem. Brit. Anim.* p. 53.

AQUILA. EAGLE.

BILL shorter than the head, very deep, compressed, straight, with a longish curved tip: upper mandible with a broad cere at the base, its dorsal outline nearly straight but sloping a little at the base, beyond the cere curved so as to form the fourth of a circle, the ridge convex, the sides slightly convex and sloping, the edges sharp, overlapping, nearly straight, with a slight festoon, and a shallow sinus close to the tip, which is deflected, subtrigonal, acute, concave beneath, its lower part perpendicular; lower mandible with the angle medial, rather broad and rounded, the dorsal line convex, the ridge rounded, the sides convex, the edges sharp, inflected, straight until near the tip, which is obliquely truncate and rounded.

Mouth rather wide; palate flat; upper mandible concave within, the lower more deeply so; the palatal slit defended by acute papillæ, the glottis also papillate behind. Tongue papillate at the base, short, fleshy, slightly concave above, rounded and slightly retuse at the extremity. Œsophagus wide, dilated about the middle, at the lower part gradually enlarged and glandular, the cylindrical glandules forming a broad belt. Stomach compressed, oblong, slightly curved, the two radiated tendons small, and the muscles thin. Pylorus with a

valve formed of three projections. Intestine very slender, nearly uniform in diameter until towards the extremity, where it is dilated; two small cæca.

Nostrils oval, oblique, lateral, open, with a process from the anterior margin, and placed in the fore edge of the cere. Eyes large, overhung by a thin projecting eyebrow; eyelids edged with bristly feathers. Aperture of the ear roundish, rather large.

Head broad, large, roundish; neck rather long and strong; body full and muscular, of great breadth anteriorly; wings long. Legs of moderate length, strong; tibiæ proportionally long, strong and muscular; tarsi short, rounded, robust, feathered to the toes, which are strong, united at the base by a short web, first and second of nearly equal length, the former stronger, fourth shorter and smallest, third considerably longer, all covered above with series of angular scales, until at the end where there are a few large scutella, beneath granulate; claws large, curved, tapering, acute, convex above, rounded on the sides, flat and broadish beneath, those of the first and second toes largest, that of the middle toe with an inner sharp edge and deep groove.

Plumage compact, imbricated, glossy. Cere bare; space between the bill and eye sparsely covered with very small, narrow feathers having distant disunited barbs. Feathers of the neck narrow, of the back broad, of the belly very soft and downy, of the outer part of the tibia elongated. Wings long, broad, rounded, the fourth or fifth quill longest; the primary quills broad, tapering, but rounded at the end; the secondary broad and rounded. Tail rather long, broad, rounded, of twelve broad, rounded and acuminate feathers.

The genus *Aquila*, of which our own Golden Eagle, *A. Chrysaetus*, is a characteristic representative, is composed of birds of large or moderate size, of more rapacious habits than those of the preceding genus, although, like them, they do not disdain dead animals. They seek repose in unfrequented mountainous places, nestle in rocks, and make extensive excursions in quest of prey. More active and lively than the sea-eagles, they bear a greater resemblance to the falcons, although still heavy, and incapable of very rapid evolutions, so that they are obliged to pounce their prey on the ground, or pursue birds not remarkable for celerity of flight, or dexterity in evading pursuit. The *Aquilæ* differ from the *Haliaëti* chiefly in having the bill shorter and thicker, the tail longer, the tarsi for the most part feathered to the toes instead of being feathered only one-third down. There is, however, a gradual transition from the one genus to the other, as is manifested especially in *Aquila fucosa* of New Holland, which has the bill of *Haliaëtus*, with the form and plumage of the Golden Eagle; and a similar affinity exists between *Aquila* and *Pandion*, as I shall afterwards shew. The genus *Gypaëtus* seems to me to be more connected with *Aquila* than with *Haliaëtus* in its general aspect, and in the form of its bill and feet, while in both respects it is still more nearly allied to the family of vultures. The eagles properly so called are most intimately allied to the genera *Pandion* and *Buteo*, as will be explained when speaking more particularly of them.

AQUILA CHRYSÆTUS.

THE GOLDEN EAGLE.

The tail rounded, longer than the wings; the head, neck, and short tibial and tarsal feathers light yellowish-brown; the back and tail dark brown; four scutella on the first and third toes, three on the second and fourth. The young birds dark brown, with the base of the tail white.

MALE.—The male of the Golden Eagle is much smaller than the female. Both have a more animated appearance than the White-tailed Sea-Eagle, but especially the former, which in character resembles some of the larger hawks. The body is robust, the neck of moderate length, the head rather large, the wings long and ample, but not extending when closed to the tip of the tail, which is rather long, broad, and rounded, the feet very robust, moderately long; the tarsi feathered to the toes, which are covered above with roundish scales, excepting at the end, where there are four broad plates on the first and third toes, and three on the second and fourth; the claws large, roundish, curved, acute, their lower surface flat and rather broad, that of the third toe acutely marginate interiorly.

The sides of the cere and a broad space from the bill to the eye are covered with setiform feathers, which are

downy at their base; the lower eyelid and projecting eyebrow bare; the edges of the eyelids are furnished with bristly feathers; the gular feathers are setiform and downy at the base. The feathers of the head are shortish, narrow-lanceolate; of the neck elongated-lanceolate; of the back ovate, acuminate; on the rest of the upper surface, acuminate but rounded, even the long scapulars, which are very round, having a minute tip; the pectoral feathers rounded. All these are compact and distinct; but the ventral are very long, tufty, loose and confused. A bunch of long feathers on the outside of the tibia; the tarsal feathers, which are continued to the toes, are short, and rather distinct. The wings when closed reach nearly to the tip of the tail; the primary quills are rather acute, the first six abruptly cut out internally, and slightly so on the outer web; the secondary are long, broad, and rounded. The tail-feathers twelve, nearly straight, broad, and rounded.

The bill is pale greyish-blue near the cere, black at the end; the cere pale greenish-yellow, the basal margins of the mandibles straw-yellow. The space between the eye and the bill, and the bare parts about the eye, are yellowish-grey tinged with green. Irides light brown. Feet pale orange, approaching to straw-yellow; claws bluish-black, with a tinge of purplish-brown.

The hind part of the head, and the neck, excepting in front, are light yellowish-brown, the shafts and concealed parts of the feathers dark brown. The fore part of the head, the cheeks, the throat, and the lower parts in general, deep brown. The back is dark brown, with purplish reflections, the smaller wing-coverts

lighter, the primary quills brownish-black, the secondary with their coverts dark brown, as is the tail, which is paler towards the base, with irregular pale greyish-brown markings, its upper coverts pale brown, tinged with grey, the lower light yellowish-brown. The short feathers of the tibiae and tarsi are light yellowish-brown, their shafts dark brown; the outer elongated feathers dark brown. The concealed parts of the feathers on the upper parts of the body are white, on the lower parts dusky grey.

Length 2 feet 9 inches, extent of wings 6 feet; bill along the back $2\frac{3}{4}$ inches, to the tip of lower mandible $2\frac{1}{2}$; tarsus $3\frac{2}{3}$; middle toe and claw $4\frac{1}{4}$, hind claw $2\frac{1}{4}$.

FEMALE.—The female is in general precisely similar in colouring to the male. The following description was taken from a very fine individual of ordinary size. The colour of the bill, feet, and other bare parts, was as above, that of the irides yellowish-brown. The bristly feathers about the head brownish-black; the frontal, gular, anterior cervical, pectoral and ventral, very dark brown; the dorsal, superior alar, and external tibial, blackish-brown with paler margins; those of the crown and occiput, the posterior and lateral cervical, as well as a few of the anterior inferior cervical, pale reddish-brown, becoming tinged with chestnut downwards, the shafts and middle parts umber. Edges of wings and lower wing-coverts of the same colour, the latter mixed with deep brown. Quills, tail-feathers, and scapulars brownish-black at the end, toward the base cinereous brown, the two former marked with irregular bands of dull grey, the latter with small irregular spots. A por-

tion of the outer web of the second tail-feather near the base mottled with reddish-white. Tail-coverts pale brown, tinged with grey and reddish. Inside of the legs and lower tail-coverts brownish-red, approaching to chestnut-brown; tarsal feathers paler, and becoming mixed with grey below. The basis of all the feathers white, which becomes apparent on the hind neck when the plumage is a little raised; while of the tail-feathers the basal down only is white.

Length 3 feet, extent of wings 7 feet; bill $2\frac{3}{4}$ inches, $1\frac{1}{4}$ deep before the cere; tarsus $3\frac{3}{4}$; middle toe and claw $4\frac{1}{4}$, hind claw $2\frac{1}{4}$; length of nostrils $\frac{3}{8}$.

VARIATIONS.—In adult birds there are considerable variations in size, the males ranging in length from two feet six inches to three feet; the females from two feet ten inches to three feet six inches. The smallest male which I have measured was five feet six inches between the tips of the wings, and the largest female seven feet; but Mr Selby says it often measures “upwards of eight feet across, when the wings are extended,” and it is stated that one was shot at Warkworth, in 1735, which measured eleven feet three inches across. In colour some variations occur, the younger birds being generally darker, with the base of the tail paler.

The changes which the plumage undergoes as it becomes old and fades are not remarkable.

HABITS.—In the observations made with respect to the habits of eagles in this country, the two species have not been always distinguished. Indeed, it is not more than fifteen years since it was generally be-

lieved that there were four distinct species, viz. the Cinereous Eagle, the Sea-Eagle, the Golden Eagle, and the Ring-tailed Eagle; of which, however, it is now well known that the two former are merely the old and the young of the White-tailed Sea-eagle, the two latter the old and the young of the species described in the present article. On accounts respecting the exploits of these birds, therefore, little dependence can be placed, when we wish to refer to the precise species. In the following account I shall strictly confine myself to facts that relate, not to eagles in general, but to the particular species under consideration.

My first acquaintance with the Golden Eagle happened in the following manner. On the farm of Northtown, in Harris, at that time held by my uncle, great havoc had been made among the lambs by the eagles, which resorted to that peninsula from all parts of the mainland, and from the neighbouring island of Shellay. Two pairs usually nested on the high rocks at its western extremity, and several covered pits had been formed in their vicinity, in the manner described in the preceding pages. I had just commenced the use of the gun, under the guidance of my uncle, and had only as yet fired five shots; with the first of which I had riddled a table, with the second demolished a rock-pigeon, killed two with the third, and with the rest had done nothing to my credit as a marksman. The sixth was destined for a higher deed. Not finding any flesh or fish, recent or putrid, about the place, I laid hold of a white hen, to the legs of which I fastened a bit of twine and a wooden peg, filled one of my jacket-pockets with barley-grain, the other with old newspapers; and, taking the

hen under my arm, and my gun on my shoulder, proceeded to the farther brow of the hill. There I fastened the bird to the turf by means of the peg, left her the barley, put a double charge of buck-shot into the gun, and shut myself up in the pit. Before I had been there an hour, the rain had made its way through the roof, the newspapers had ceased to amuse, and I had fallen into a sort of slumber, from which I was startled by a shrill scream. My first motion was to peep through the hole, when I beheld an eagle perched on the back of the hen, which crouched close to the ground in terror; my second was to raise to my shoulder the butt of my gun, of which the muzzle lay in the aperture of the hut; and, at the moment when the eagle was in the act of raising his head, as if to inflict a blow upon his unresisting victim, I fired, and received a severe contusion on the cheek, the gun having been overcharged. Impatient to know the result, I raised the roof on my back, forced myself through it, and, running up to the place, found the eagle quite dead; the whole shot having entered its side. So, this is all, thought I;—an eagle is nothing wonderful after all. I remember feeling precisely in the same manner after shooting my first deer. There is more pleasure in compassing than in obtaining many objects, and were it otherwise, many objects would be left unattained. I threw the eagle upon my back, brought a leg on each side of my neck, tied the feet before, put the hen, which had been but slightly injured by the grasp of the tyrant, under one arm, the gun under another, and thus accoutred, soon made my appearance on the brow of the hill. As I descended, the people came out to see what I had got;

some thinking it a bunch of heather put up with the view of deceiving them, others alleging that *Uilleam beg* had actually shot an eagle. The latter, as you are aware, "good reader," were right, and my uncle was as proud as myself, for I had proved a hopeful scholar, and saved him, perhaps, half a score of lambkins. This eagle, although very beautiful, was very small, measuring only five feet six inches from tip to tip; but as I was not then a naturalist, the bird was allowed to rot on the dunghill, without having its quills counted or its bill gauged. As to the hen that had been in such peril, first from the talons of an eagle, and then from the shot of a raw recruit, it still continued useful in its way, reared a brood of chickens, and was finally eaten.

Many years after, having ascended to the summit of one of the lofty mountains in the Forest of Harris, in search of plants (for I had by this time become a botanist), I stood to admire the glorious scene that presented itself, and enjoy the most intense of all delights—that of communion in the wilderness with the God of the Universe. I was on a narrow ridge of rock, covered with the *Silene acaulis*, whose lovely pink blossoms were strewn around; on one side was a rocky slope, the resort of the ptarmigan; on the other a rugged precipice, in the crevices of which had sprung up luxuriant tufts of *Rhodiola rosea*. Before me, in the west, was the craggy island of Scarp; toward the south stretched the rugged coast-line of Harris, margined on the headlands with a line of white foam; and, away to the dim horizon, spread out the vast expanse of the Atlantic Ocean, with the lonely isles of St Kilda on its extreme verge. The sun, descending in the clear sky,

threw a glistening path of light over the waters, and tinged the ocean haze with purple. Suddenly there arose over the Atlantic a mass of light thin vapour, which approached with a gentle breeze, rolling and spreading around, and exhibiting the most beautiful changes of tint. When I had gazed until the fading light reminded me that my home for the night was four miles distant, I approached the edge of the precipice, and bent over it, when, from the distance of a few yards beneath, a Golden Eagle launched forth into the air. The scene, already sublime, was by the flight of the eagle rendered still more so, and, as I gazed upon the huge bird sailing steadily away beneath my feet, while the now dense masses of cloud rolled majestically over head, I exclaimed aloud " Beautiful ! " The great God of heaven and earth, myself, his perverse but adoring subject, and the eagle, his beautiful but unending creature, were all in the universe of my imagination. Scenes like these might soften the obdurate, elevate the grovelling, convince the self-willed and unbelieving, and blend with universal nature the spirits that had breathed the chilling atmosphere of selfishness. Verily, it is good for one to ascend a lofty mountain ; but he must go alone ; and if he be there in the solemn stillness of midnight, as I have been, he will descend a better and a wiser man. Beautiful truly it is, to see the eagle sweeping aloft the hill side, sailing from one mountain to another, or soaring aloft in its circling flight until it seems to float in the regions of the thin white cirri, like the inhabitant of another world looking down upon our rebel earth, as if desirous to visit it, but afraid to come within its contaminating influence.

And not in its distant flight alone is the Golden Eagle a beautiful object ; viewed at hand it cannot fail to inspire admiration, but then you must see it seated on some pinnacle of its native rocks, where, however, few will venture for the sake of such a gratification. In captivity, although it may retain much of its character, it loses the associations which give that character interest ; and thus seen, it resembles in its attitudes the White-tailed Sea-Eagle already described, although it is somewhat more lively. The male bird is much smaller, and consequently quicker in its movements, than the female, and, when unusually small, has more of the appearance of a large hawk.

The flight of this species is so exactly similar to that of the White-tailed Sea-Eagle, that I could never distinguish the one bird from the other by it alone. It seems, however, to be more rapid ; and, in accordance with this supposition, is the fact that the Golden Eagle is much more destructive to grouse than the other, while it has also a greater propensity to prey on living animals in general. But although it destroys grouse, sea-birds of various kinds, hares, and other animals, it by no means disdains to feast upon a dead sheep, a fish that has been cast ashore, or any other carcass that may fall in its way. It is generally considered in the Hebrides as more destructive to lambs, and it sometimes carries them off after they have grown to a considerable size. An instance of this occurred under my own observation. A lamb belonging to myself, and which was feeding with its mother near the house, was seized by an eagle, and slowly carried up along the side of the hill. An outcry having been raised

by a person who had witnessed the seizure, I, and some other boys, ran after the eagle, shouting as loud as we could. On reaching the brow of the hill, the bird rested with its prey, but being frightened by the noise, and seeing us approach, it left the lamb, which we found but slightly injured, the eagle's talons having been stuck into its back.

In the Hebrides, the ravens, although they sometimes destroy lambs or sickly sheep, are fostered on account of their enmity to the eagles, which they drive away from the neighbourhood of their own station. Whenever an eagle approaches the rock in which the ravens have their nest, they immediately rush forth to attack it. One of them flies above, the other beneath, and both endeavour to peck at him, but apparently without actually accomplishing their object; and the eagle seems to be glad to get away more on account of their annoyance than of any real injury that he dreads from them. The ravens in those islands are generally the first birds to discover a dead sheep or other animal; but they have not long enjoyed the feast before the eagle comes up, on which they retire to a short distance, and wait until he has departed. Before alighting on a carcass, this species generally sails over it in short circles, often with great rapidity; and I have seen several individuals thus flying around a dead sheep. If the ravens have not already picked out the eyes, those organs furnish the first morsels; it then tears open the abdomen.

But the Golden Eagle seems to prefer live prey to carrion, and easily secures grouse, in searching for which it flies low over the moors, sailing and wheeling

at intervals. Hares, roes, and even red-deer, it also attacks; but it does not haunt the shores for fish so much as the Sea-Eagle does.

There seems to be very little probability that eagles have the sense of smell very acute; but that their vision is so is evident. I am not, however, inclined to think that they perceive objects from the vast height to which they sometimes soar, because I never saw one descend from such an elevation in a manner indicating that it had observed a carcass or other eatable object; whereas, on the other hand, I have very frequently seen them flying along the sides of the hills at a small height, obviously in search of food, in a manner somewhat resembling that of the sparrow-hawk, but with much less rapidity.

A gannet was brought to me in Harris, which had been knocked down dead by an eagle as it flew across an isthmus. That bird flies along the shores while fishing, following their sinuosities; and although I have very frequently watched them at all times of the day, I never observed one to cross a neck of land, however small. But in this instance an exception occurred to the general rule; the unfortunate bird having thought of gaining the sound of Harris by crossing the sandy isthmus of Ui, upwards of a quarter of a mile in breadth. An eagle happened to be near at the time, and probably judging the bird altogether out of its latitude, came down upon it with such force as to drive it to the ground dead. Some people who were working near the place ran up and secured the gannet. I have no reason, however, to believe that eagles commonly prey on gannets.

Neither this, nor the other eagle described, ever hovers in the manner of a hawk, remaining stationary in a spot, while looking for prey. On account of the weight of its body, and the great size of its wings, which it is unable to wield with sufficient quickness, it is obliged, in searching a portion of ground, to fly in short circlings, which it does by means of alternate flappings and sailings, the wings seeming as if slightly curved upwards during the latter. When proceeding to a distant hill or island, it flies with a regular direct motion, sailing occasionally, but more frequently moving by measured flappings; and its flight appears to me to be more rapid when performed in the latter than in the former manner, unless when it is descending obliquely.

The cries of the Golden Eagle are similar to those of the other, and are chiefly heard at the commencement of the breeding season. Temminck says that its cry is a hoarse and weak sound—"son eri est un son rauque et faible;" but this probably is rather an inference from his statement as to the anatomy of its trachea, than a fact obtained by observation. For my own part, I am assured, by the evidence of my ears, that its cry is shrill, loud, and clear, and its yelping or barking notes as loud as those of the White-tailed Sea-Eagle.

This species appears to be much less numerous than the other, but its distribution is similar. In the Hebrides it is as well known as the Sea-Eagle, and resorts to the same places to rest; but in the interior of the northern and middle divisions of Scotland, it is more frequent than that species. The Golden Eagle is said to occur in most parts of Europe, but to be more abundant

in the northern regions, and in the mountainous districts of the middle and southern countries. According to Prince Charles Bonaparte, and Mr Drummond, it is found among the rocky mountains of North America; and Mr Audubon has figured and described a fine male, of which I have seen the skin with him, and which was caught in a trap on the White Mountains of New Hampshire.

PROPAGATION.—The Golden Eagle prepares its nest about the same time as our other species, that is towards the beginning of March, and chooses for this purpose a similar locality. Although it is often seen on the maritime cliffs of the Hebrides, yet the species has a greater predilection for inland precipices than its more aquatic friend. The central ranges of the Grampians, and the rocky mountains of the western and northern parts of the middle division of Scotland, as well as the Hebrides and Orkney and Shetland Islands, afford many suitable places. The nest, in so far as I know, from having seen only one at some distance, and from the description of shepherds and a relative who has several times been in eagles' nests, is similar to that of the White-tailed Sea-Eagle. The eggs are generally two, sometimes one; yellowish-white, with irregular pale purplish dots. The young are fledged about the end of July, and soon after coming abroad are left to shift for themselves, or rather driven off from the haunts of their parents.

“ High from the summit of a craggy cliff,
Hung o'er the deep, such as amazing frowns
On utmost Kilda's shore, whose lonely race

Resign the setting sun to Indian worlds,
 The Royal Eagle draws his vigorous young,
 Strong-pounced, and ardent with paternal fire,
 Now fit to raise a kingdom of their own,
 He drives them from his fort, the tow'ring seat,
 For ages, of his empire; which in peace,
 Unstained he holds, while many a league to sea
 He wings his course, and preys in distant isles.'

THOMSON'S *Seasons*.

YOUNG BIRD FLEDGED.—The bill is brownish-black, paler at the base; the cere pale greenish-yellow; the irides dark brown; the feet lemon-yellow; the claws brownish-black. The general colour of the plumage is deep brown, that of the head and hind-neck, as well as the short feathers of the legs and tarsi, pale yellowish-brown. The base of the feathers is white, and that colour appears in patches on the hind-neck, the scapulars, some of the wing-coverts, and the greater part of the tail, the terminal third only being dark brown. The lower tail-coverts are dull white, each with a light brown patch towards the end.

PROGRESS TOWARDS MATURITY.—As the bird advances in age, the white of the basal portion of the feathers diminishes in extent, so that the spots or patches of that colour gradually disappear from the body and hind-neck, and the tail becomes irregularly barred with dark brown, the intervening white markings diminishing in extent, and becoming shaded with greyish-brown. The dark brown colours of the plumage undergo little change; but the light yellowish-brown of the head, hind-neck, edges of the wings, and legs, as-

sumes a richer tint. It had been considered inconsistent with analogy that the tail of the Sea-Eagle from being brown should become white, while that of the Golden Eagle from being white should become brown; but the change, in both cases, proceeds precisely on the same principle, namely, the gradual diminution of the white base of the plumage. After this change has been effected, the tail of the Sea-Eagle gradually becomes white from the tip rootwards, or rather from the middle towards the ends, and the head becomes paler, while the tail of the Golden Eagle remains without much perceptible change, although the head and some other parts become brighter.

It would be injudicious to obscure a subject already sufficiently clear, by describing individuals at different ages; for although the younger birds were formerly considered as of a distinct species, which was named the Ring-tailed Eagle, it has been satisfactorily proved by observation, that the ringed gradually merges into the banded, and ultimately into the uniform or obscurely variegated brown tail. The question has been settled for ever; but, with me at least, another remains, which is this. I have seen so many eagles in the Outer Hebrides of very small size, although similar in colour, or nearly so, to the Golden Eagle, that I suspect another distinct species to exist there, which at an early age has not the tail marked with a white band. The truth of this conjecture, however, can be determined only by observation; and, whether for this particular purpose, or for that of examining eagles generally, no part of Britain is so well adapted as the islands of Harris and Lewis, where these birds, notwithstanding the unceasing

hostility of shepherds and others, are still, if not abundant, at least not rare.

REMARKS AND ADDITIONAL OBSERVATIONS.—Since the preceding description was written, I have examined three fine specimens of the Golden Eagle, of which two, a male and a female, from Argyllshire, I have seen with Mr John Edmonston, Prince's Street, Edinburgh; the third a perfect old male, in the possession of Mr Stevenson, writing-master, in the same city. The latter bird was found dead in the sea near North Berwick some years ago.

Male, from Argyllshire. The general colour is deep brown. The feathers of the hind-head and neck are light yellowish-brown, those of the inner and fore-side of the legs and of the tarsi of a deeper tint, inclining to chestnut; the lower tail-feathers also yellowish-brown. The edges of the wings are pale brownish-grey; most of the wing-coverts are margined and tipped with pale brownish-grey, and the inner secondary quills are of the same colour tinged with purple. The alula and primary quills are brownish-black, as are their shafts; their inner webs irregularly barred with greyish-white, as are both webs of the outer secondary quills, the outer however very obscurely. The tail is for the most part greyish-brown, irregularly and obscurely barred with lighter, and towards the end brownish-black. The scapulars and inner secondary quills are glossed with purple and shining.

Length 2 feet 8 inches; wing from flexure 2 feet; tail 1 foot 1 inch; bill along the back $2\frac{1}{2}$ inches, to the

tip of lower mandible $2\frac{1}{4}$, its depth at the base $1\frac{2}{12}$; tarsus $3\frac{3}{4}$; middle toe to the claw $2\frac{1}{12}$; its claw $1\frac{1}{2}$.

Male, from North Berwick. Mr Stevenson's bird is rather larger, and agrees with the above, but its colours are more uniform, and generally darker; and the tail, which is very dark brown, exhibits but very faint indications of bars.

Female, from Argyllshire. The general colour is similar to that of the male; the edge of the wing with less grey, and nearly of the same tint as the hind-neck; the wing-coverts and inner secondary quills more distinctly margined and tipped with brownish-white. The upper tail-coverts are light greyish-brown, and the base of the tail-feathers, more especially of the three outer, is white.

Length 3 feet 2 inches; wing from flexure 2 feet 3 inches; tail 1 foot 2 inches; bill along the back $2\frac{1}{12}$ inches, to the tip of lower mandible $2\frac{1}{2}$, its depth at the base $1\frac{1}{2}$; tarsus 4, middle toe to the claw $2\frac{3}{4}$, its claw $1\frac{1}{2}$.

The wings are long, reaching to about two inches of the end of the tail, and rather rounded, of twenty-five quills, the third primary longest, the fourth almost equal, the second a little shorter, the first considerably shorter than the second.

I have here also to add a few particulars respecting the eggs of the White-tailed Sea-Eagle and the Golden Eagle. An egg of the former species, from Orkney, now in the Museum of the University of Edinburgh, is yellowish-white, without spots, of a regular oval form, $3\frac{1}{4}$ inches in length, $2\frac{1}{2}$ in breadth. Another, of the Golden Eagle, in the same collection, and brought

by myself from Harris, is yellowish-white, sparingly marked with small purplish dots, $3\frac{2}{17}$ inches in length, by $2\frac{4}{17}$ in breadth.

For the following information respecting eagles, I am indebted to Mr Alexander G. Macgillivray, who had the kindness to procure it from his brother Mr Robert Macgillivray, a native of Sutherland, in which district these birds are still pretty numerous. Both species occur there; and as they are not distinguished by the writer, his observations must be considered as applying to the eagles of Sutherland generally.

“ The little sparrow-hawk attacks the eagle fearlessly, and, by its superior agility, eludes the grasp of its doughty enemy. Mr Sutherland saw an eagle obliged to drop a moorfowl from the constant attacks of a sparrow-hawk.

“ While John M^cKay was in Kildonan, an eagle bore away a dog, belonging to William Armstrong, which was three years old, and about the size of a hare. Eagles carry off hares very frequently, and sit on the top of some lofty eminence to devour them. A Kildonan eagle pounced upon a cat, and bore it away to her nest. The injuries inflicted by the clutch of the eagle, and the unusual mode of travelling, so confounded poor puss, that she exhibited no signs of life, and was accordingly left for dead by the eagle with her young ones. But soon after the eagle had left the nest, the cat revived, and having killed the eaglets, made a hearty meal of one of them. She then made a hurried retreat, and effected her escape without farther injury. This anecdote is well authenticated.

“ Mr Sutherland related another anecdote to me,

which he affirms is perfectly true. Two sons of a man of the name of Murray, in Achnaluachrich, having robbed an eagle's nest, were retreating with the young, when one of the parent birds, having returned, made a most determined attack upon them. They said they had never been in such peril; for the eagle dipped her wing in a burn that ran by, and then in sand, and sweeping repeatedly by them, struck at them with her wing. Although each had a stick, it was with great difficulty that they at length effected their escape, when almost ready to sink under fatigue.

“John M^cKay says, that, when an eagle approaches a wood, you may sometimes see thirty or forty black grouse rise, while she is yet at the distance of a quarter of a mile, and scamper off in great haste. He also states, that the stench from the nest is quite intolerable, owing to the quantity of putrid matter about it; and that he saw six red grouse at once, with a great many bones, in the nest of a large hawk.”

With respect to the above anecdotes, I have only to remark, that, having been furnished by respectable persons who have resided in districts where eagles are not uncommon, they are entitled to full credit. The occurrence of a similar fact in Scotland, seems to confirm the Norwegian account of eagles attempting to blind oxen by wetting their feathers and then covering them with sand, as related in Von Buch's Travels; but the Sutherland eagle certainly took the most judicious plan, when it dipped the wing only, without clotting the rest of its plumage.

The Golden Eagle in captivity, is more ferocious than the White-tailed Sea-Eagle, and can scarcely be

trusted even by the person who regularly supplies it with food. Mr Selby states that two birds of this species which he had in his possession for some years appeared untameable; their fierceness having been in no respect diminished since he first received them. The capability of existing under long continued privation of food, has sometimes been exhibited in a wonderful degree by captive eagles, which have been accidentally neglected for days or even weeks.

Having nothing of any importance to add from my own observation to the account given above, and being unwilling to swell out this article with remarks or anecdotes taken from other writers, I conclude with a short list of synonyms.

The adult birds of this species are named by naturalists the Golden Eagle, although certainly their colours have no relation whatever to that of gold. The young birds were formerly named the Ring-tail Eagle. The general name in the Highlands and Hebrides is the Black Eagle, *an Iolair dhubh*; and so it is called, whether young or old, with a white ring on the tail, or with a tail destitute of white.

Falco Chrysaetos. *Linn. Syst. Nat.* vol. i. p. 125. Old.

Falco fulvus. *Linn. Syst. Nat.* vol. i. p. 125. Young.

Falco Chrysaetos. *Lath. Ind. Ornith.* vol. i. p. 12. Old.

Falco fulvus. *Lath. Ind. Ornith.* vol. i. p. 10. Young.

Golden Eagle. *Mont. Ornith. Dict.* Old.

Ring-tail Eagle. *Mont. Ornith. Dict.* Young.

Aigle Royal. Falco fulvus. *Temm. Man. d'Ornith.* p. 38.

Aquila Chrysaetos. Golden Eagle. *Flem. Brit. Anim.* p. 52.

PANDION. OSPREY.

Bill shorter than the head, strong, as broad as deep at the base; upper mandible with a rather narrow cere, its dorsal outline sloping a little as far as the edge of the cere, the rest curved so as to form about the third of a circle, the ridge broadly convex, the sides also convex, the edges sharp and slightly inflected, with a slight festoon, and a wide shallow sinus at the curvature, the tip deflected, trigonal, very acute, nearly perpendicular at the end to the gape line; lower mandible with the angle short, broad, and rounded, the dorsal line convex, the ridge broadly rounded, the sides convex, the edges sharp, inflected, considerably curved, the tip obliquely truncate and rounded.

Mouth of ordinary width; palate flat; upper mandible concave within, the lower more deeply so; the palatal slit defended by acute papillæ, the glottis also papillate behind. Tongue papillate at the base, short, fleshy, slightly concave above, rounded at the extremity with a shallow notch. Œsophagus wide, slightly dilated about the middle, and again at the lower extremity, which is studded with cylindrical glandules. Stomach large, oblong, its muscular coat very thin, as are the two indistinct central tendons; the inner coat soft, without rugæ. Intestine very slender, nearly uni-

form in diameter, slightly wider at the upper end, and considerably dilated at the lower.

Nostrils oblong, broader above, slightly curved, oblique, lateral. Eyes large, without a projecting eyebrow; eyelids edged with bristly feathers. Aperture of the ear roundish, rather large.

Head not remarkably large, ovate; neck rather long, and somewhat slender; body of moderate bulk, not so robust as in the eagles; wings very long. Legs of great strength, and moderately long; tibiae long and muscular; tarsi very short, thick, rounded, covered all round with imbricated scales, of which the anterior are larger and flat, the posterior smaller, and having the upper angle elevated into a point; toes thick, strong, free, the fourth or outer versatile, and larger than the second, all covered with imbricated scales, of which those on the sides, and especially beneath, rise towards their centre into a conical point; on the inner side of the outer toe, some of them being so prominent as to resemble short spines; towards the end above are a few broad scutella. Claws long, rather slender, very acute, curved into a semicircle, rounded above and beneath, the sides flattened, those of the first and fourth toes largest, that of the middle toe with an inner projecting edge and internal flat surface.

Plumage compact. Cere for the most part bare; eyelids feathered; space between the bill and eye sparsely covered with bristly feathers. Feathers of the head and neck compact, rather short, narrow, and tapering; of the back broad, rounded, but acuminate, as are those of the breast; the abdominal feathers softer and more elongated. Tibial feathers short, slender,

and rather soft, without the tuft of long feathers observed in the eagles and most other genera of this family. Wings very long, comparatively narrow, rounded, with thirty quills, the third primary longest, the second nearly equal, the fourth not much shorter, the first longer than the fifth; the primary quills tapering but rounded; the secondary broad and rounded; the tertiary largely developed. Tail rather long, slightly rounded, of twelve broad rounded feathers.

The genus *Pandion*, of which the only true species known to me is the Osprey, *P. Haliæetus*, is closely allied to the genera *Aquila* and *Haliaëtus*, perhaps more especially to the latter, through the intervention of a genus or group, of which the *Falco Ichthyaëtus* of Dr Horsfield is characteristic. That bird has the bill more of the form of that of the *Haliaëti*, and its tarsi are anteriorly covered with broad scutella as in them; but the general form is that of *Pandion*, and the wings and tibiae in particular resemble those of the Osprey, the latter being equally destitute of the long tufted feathers. On the other hand, the claws are flat beneath, as in the *Haliaëti*. In other respects, the Osprey comes naturally enough after the eagles, and introduces the hawks or smaller species of the Falconine family. In thickness and strength of bill the true falcons may be considered as following the Osprey; but the buzzards, in their general form, in that of their bill, which, although comparatively smaller, and more abbreviated, is in many respects very similar, and in the structure of their feet, which very much resemble those of some *Haliaëti*, certainly come near to the birds of the genera *Haliaëtus* and *Aquila*. The points of connection it is not my

purpose to define or establish, otherwise I should convert my Treatise on the Rapacious Birds of Britain, into a theoretico-practical rhapsody on groups and species in general, an instance of which kind of digression from the subject in hand might easily be pointed out. After describing the Osprey, therefore, I shall proceed to describe the Buzzards in order, and bring in their rear the Falcons, and other groups. Should one place the Common Buzzard, and the Rough-legged Buzzard, beside the Golden Eagle, he will readily perceive the very great similarity that exists between them. The differences in the comparative size of the bill,—for there are scarcely any in its form,—and in the general bulk of the birds, are gradually diminished by the interposition of exotic species, some of which also unite the osprey with the eagles on the one hand, and with the buzzards on the other.

PANDION HALIAETUS.

THE OSPREY.

MALE.—The Osprey, Fishing Eagle, or Fishing Hawk, as it has been variously named, is remarkable among the British birds of prey for the peculiar adaptation for fishing evinced by the form of its claws, the prominence of the thick conical scales of the lower surface of its toes, the shortness of the plumage of its legs, and the great length of its wings.

It is unnecessary to repeat here what has been said in the generic character, which will be understood to apply entirely to the species in question, it being the only one known to me as certainly belonging to the genus *Pandion*; but a few additional facts may be here given without impropriety. The intestines, according to Wilson, measured, in an individual examined by him, “within an inch or two of nine feet, and were no larger than those of a robin,” that is, of the migratory thrush. The tarsus is feathered anteriorly about one-fourth down. The wings, being extremely elongated, and especially having the cubitus proportionally long, have thirty quills, whereas the White-tailed Eagle and the Golden Eagle have only twenty-five; and the tertiaries, to the number of about ten, are as largely developed and as strong as the secondaries. The first three quills are deeply notched internally towards the end. When closed, the wings, however, do not much exceed the

tail in length, being only about an inch and a half longer. The hind toe has four large scales or scutella; the rest, which are longer, and nearly equal to each other in size, have each three entire scutella. The claws of the first and fourth toes are larger than those of the others.

The bill is brownish-black, at the base bluish, as well as along the edges toward the angle of the mouth; the cere light greyish-blue; the irides deep yellow; the feet pale greyish-blue; the claws black.

The general colour of the upper parts is deep brown, beautifully glossed with light purple, the margins and tips of the feathers pale brown or brownish-white. The crown of the head and the occipital region are yellowish-white, each feather with a central streak of dark brown; the sides of the head white; a broad blackish-brown band from the eye down the side of the neck, blending with the general colour of the back. The quills are dark brown, the primaries towards the end brownish-black and glossed with purple, the shafts light brown at the base, darker towards the end, the inner webs barred with greyish-white. The tail light or hair brown, faintly barred with darker; the inner webs, except of the two middle feathers, with confluent spots of greyish-white, the tips yellowish-white. The whole of the lower parts is white, except the lower part of the neck and upper part of the breast, which have commonly a number of light brownish-red streaks, and the lower wing-coverts, which are mottled with brown.

Length 23 inches, extent of wings 60; bill $1\frac{3}{4}$ along the back, $1\frac{3}{4}$ to the tip of the lower mandible; tarsus $2\frac{1}{8}$; hind toe 1, its claw $1\frac{1}{2}$; outer toe $1\frac{1}{4}$, its claw $1\frac{3}{4}$;

third toe $1\frac{1}{2}$, its claw $1\frac{1}{2}$; inner toe $1\frac{1}{2}$, its claw $1\frac{1}{2}$; wing from flexure 18; tail 8.

FEMALE.—The female is considerably larger, but does not differ much in colour. On the upper part of the head the white is less extended, being more broadly streaked with brown; and the lower part of the neck and fore part of the breast are marked with larger streaks or even patches of brownish-red. The general tint of the brown colour of the upper parts is rather deeper, and less diluted towards the edges of the feathers.

Length 25 inches, extent of wings 68; bill $1\frac{1}{2}$; lower mandible $1\frac{1}{2}$; tarsus $2\frac{1}{2}$; hind toe 1, its claw $1\frac{1}{2}$; second toe $1\frac{1}{2}$, its claw $1\frac{1}{2}$; third toe $1\frac{1}{2}$, its claw $1\frac{1}{2}$; outer toe $1\frac{1}{2}$, its claw $1\frac{1}{2}$; wing from flexure 20; tail $8\frac{1}{2}$.

VARIATIONS.—Slight variations occur even in old birds, the white on the head and neck being more or less pure, and the brownish-red patches or streaks on the breast of greater or less extent. The colour of the legs varies from light greyish-blue to very pale blue with a tinge of yellow. As they become old, the feathers of the upper parts lose their pale coloured tips, as does the tail at an earlier period, so that considerable difference is observed between newly plumed birds and those obtained towards the period of moulting.

HABITS.—According to Montagu, the Osprey is rarely met with in England, and more frequently in Devonshire than elsewhere. Mr Selby says he has

seen it on Loch-Lomond and Loch-Awe, where two eyries are annually established. It occurs on Loch-Maree, in Ross-shire, the scenery of which is of the wildest and most magnificent character; and my friend Mr Alexander G. Macgillivray informs me, that it is sometimes seen in various parts of Sutherland and Caithness, always near water. In a letter from his brother, it is stated that, in the former county, "the Fish-hawk comes in spring, and frequents rivers, sitting pensively whole hours by their banks, doing nothing. It builds on the sea-coast. It was one of them we saw at Loch-Dolay." The bird alluded to was hovering over a piece of water, in which was a great quantity of rushes and other aquatic plants, among which were numerous ducks and coots. Now and then it would descend with great rapidity, and plunge into the water, but without disappearing; and at each descent all the birds screamed, and instantly dived. In this manner it continued to fish for some time, until a shot at one of the ducks frightened it. Individuals have been occasionally seen on the Tweed, as I am informed by Mr Stevenson, Edinburgh, who has in his possession a fine individual, which was shot by himself there in the autumn of 1830; but the species is now extremely rare in all parts of the country; and it is only on the larger lakes of the Highlands, and by the streams and rocky shores of the northern division, that one has much chance of observing it. In none of the Hebrides have I ever seen it, or even heard of its existence, but it is said to occur in Orkney.

My opportunities of observing the habits of this beautiful bird have been so few, that I am obliged to

have recourse to the brief and imperfect accounts of them presented in the writings of Montagu and Mr Selby. According to these writers, the Osprey flies heavily, not much unlike the buzzard, but not unfrequently glides slowly along with motionless wing. In searching for food it sometimes hovers over the water, supporting itself by short and rapid motions of the wings, readily perceptible even at a considerable distance, its weight being probably too great to allow it to poise itself with the ease displayed by the kestrel and other small hawks. Montagu observed one hawking for fish over the river Avon, at Aveton Gifford, when, after remaining stationary for some time in the air, it descended to within about fifty yards of the surface, hovered there for a short interval, and then plunged into the water with such force as to be nearly immersed. In three or four seconds it rose with a trout of moderate size, and soared to a prodigious height. Mr Stevenson informs me, that the individuals occasionally found on the Tweed are not permanent residents, but are seen there only in autumn. He adds, that they hover over the stream while in search of their prey, plunge headlong after it so as sometimes to disappear for a while under the surface, and, when satiated, repose on old trees or stumps on the banks of the river.

The habits of the Osprey, although, probably on account of the very unfrequent occurrence of that bird in Britain, they have not been fully described by any of our ornithologists, have yet been minutely detailed by Wilson and Mr Audubon, as observed in America, where the species is very extensively distributed.

Wilson's account of its manners is very animated, and probably very correct; but as I have the pleasure of knowing the other American ornithologist, and can use the liberty of conversing with him on the subject, I shall here offer an abridged account of his history of this expert fisher.

The Fish-hawk, he says, has a more social disposition than most other birds of the family. Both in spring and in autumn it migrates in numbers, and individuals nestle and fish in the vicinity of each other without offering or receiving insult or hinderance. They even allow certain other birds to approach so near them as to build their nests in the outer parts of their own; and so unwarlike are they, that they are never seen to attack other species, or to dispute the right of the White-headed Eagle to rob them of their prey.

It differs from most other predatory birds in never attempting to secure its prey in the air; and although Mr Audubon observed them sailing about and plunging into the water in the midst of shoals of flying fish, they did not endeavour at any time to seize them while above the surface, but plunged after one of them or a bonita fish, after they had resumed their usual mode of swimming near the surface.

The motions of the Fish-hawk in the air are graceful. It rises with ease to a great height, in large spiral curves, dives at times in the air, and resumes its sailings. When searching for food, it flies with easy flappings at a moderate height above the water, and apparently in a listless mood, although in reality it is all the while keenly inspecting the objects beneath. On spying a fish which it considers a suitable prize, it

checks its course by suddenly shaking its wings and tail, plunges headlong into the water, and seizes its prey; or, if disappointed by the retreat of the fish, recovers itself and continues its flight.

In plunging after a fish, it sometimes entirely disappears for an instant, and the surge caused by its descent is such as to make the spot around it present the appearance of a mass of foam. On rising with its prey, it mounts a few yards into the air, shakes its plumage, squeezes the fish with its talons, and immediately proceeds towards its nest to feed its young, or betakes itself to a tree to devour the fruit of its industry unmolested. When it has satisfied its hunger, it does not, like other hawks, remain perched until again urged by hunger to sally forth, but usually sails about at a great height.

It seldom alights on the ground, and when it does so, walks with difficulty, and in an extremely awkward manner. It shews a great attachment to the tree to which it carries its prey, and will not abandon it unless frequently molested; and it manifests the same liking towards that on which it has built its first nest, returning to it year after year.

The Fish-hawk arrives on the southern coasts of the United States early in February, in the Middle States about the beginning of April. After the arrival of the females, which takes place eight or ten days later, the males are seen playing in the air, chasing each other in sport, or sailing by the side of their chosen females, uttering cries of joy and exultation. Each pair then begins to repair their nest of the previous year, or to form a new one. It is generally placed in a large tree,

in the vicinity of the water, whether along the sea-shore or on the margins of a lake or river, and is composed of sticks, sea-weeds, tufts of coarse grass, and other materials, with a lining of sea-weeds and finer grass. The male assists in incubating, and both birds defend their young with great courage and perseverance.

In addition to these particulars, I may here present some interesting facts, supplied by the celebrated and most enterprising author of the "Birds of America" "and Ornithological Biography," in a letter to myself.

"My dear Friend, Since the publication of the first volume of my Ornithological Biography, in which an account of the habits of the Fish-hawk is given, I have had many opportunities of extending my acquaintance with it, and have traced it along the whole extent of the Atlantic coast of the United States, and even as far north as Labrador, where it breeds. I have the greatest pleasure in presenting you with the results of my observations, which you may use in whatever way you please.

"The difference between the periods at which this species breeds along the coast, from the Gulf of Mexico to the northern shores of the St Lawrence, is very great. While on the St John's River in Florida, on the 7th February 1832, I found the Fish-hawks very abundant, and all sitting on their eggs, many of which contained chicks nearly ready for emerging. The birds, therefore, must have paired at least six weeks previous to that date. I was, however, surprised to find them more tardy in this respect than the White-headed Eagles, which had young able to fly. Three hundred

miles farther south, the Fish-hawks had laid their eggs a month earlier. Between the Floridas and New Jersey, or in the districts usually called the Middle States, they rarely begin to lay before the 15th of April. In the State of Maine, they seldom arrive before the middle of May, and in Labrador the period of their appearance is from the 1st to the 10th of June. It would be interesting to discover whether the Fish-hawk which breeds near the mouth of the Mississippi in January, breeds again in the course of the same season between that place and Labrador, or not. I have thought it not unlikely that it does, but have no facts to support the opinion.

“The Fish-hawk is far from always placing its nest on very high trees, but accommodates itself to any situation that may occur, provided other circumstances are favourable. On the Keys of the Floridas, its nest is often seen placed on a mangorve not more than seven or eight feet above the water. In two instances I saw it there on the ground, and once on the roof of a low house. In the latter case, the nest had been resorted to three successive years. In Labrador the nests which I saw were built on the stunted firs, there being no trees in the country deserving the name. In the Floridas, I saw several nests placed close to those of herons, ibises, and cormorants, all the species living together in the greatest harmony.

“I remain, my dear Mr Macgillivray, your most sincerely attached friend, and obedient servant,

“J. J. AUDUBON.

“EDINBURGH, 15th June 1835.”

PROPAGATION.—The mode of nestling adopted by the Osprey in this country is little known, although several authors write as if they were well acquainted with it. I have never seen its nest. Montagu saw one on the top of a chimney of a ruin, in an island on Loch-Lomond. It was large, flat, formed of sticks laid across, so as to rest on the sides of the chimney, and lined with flags. The eggs, according to Mr Audubon, are three or four in number, of a broadly oval form, yellowish-white, densely covered with large irregular spots of reddish-brown; this description agreeing with the drawing of an egg which I have seen in his possession. The descriptions of M. Temminck and Mr Selby are similar. An egg of this bird, supposed to be Scottish, to which I have access, is two inches and four-twelfths in length, one inch and ten-twelfths in its greatest breadth; of a short ovate form, with the narrow end much rounded; white, with large irregular blotches of dark greenish-brown, and numerous small spots of light brownish-grey. Dr Fleming says the eggs are three or four, "white, and elliptical." If so, the Scottish Osprey may be of a different species from the American; but the statements of compilers cannot be considered worthy of confidence when the original authorities are not mentioned; and, in all probability, the learned and industrious collector, if he has ever seen hawks' eggs white and elliptical, must have mistaken those of the buzzard or kite, which are sometimes white, for those of the Osprey. It is more likely, however, that, as usual, he has taken this description from Willughby, whose statement and his run thus:

“ Inter arundines humi nidificat, et ova parit 3 aut 4 magna, alba, exactè ferè elliptica : Gallinaceis minora.”
—*Willughby*.

“ Breeds on the ground, among reeds, or on trees. Eggs 3 or 4, white, and elliptical.”—*Fleming*.

Montagu more judiciously says, “ *It is said to lay three or four white eggs, of an elliptical form, rather less than those of a hen.*”

REMARKS.—In the form of the Osprey, is presented to our contemplation an example of the adaptation of means to ends, which we can in some measure comprehend. That bird lives entirely on fish, marine and fluviatile or lacustrine, and its food must be fresh; at least it does not appear to meddle with fish that have been cast ashore or left dead in the water. Its prey is slippery, and, therefore, its claws are long and much curved, its toes nearly of equal length, and capable of being applied in the most effectual manner, in pairs, two and two opposite each other. It must also possess considerable power, and therefore its legs are strong and muscular; and to prevent its being inextricably entangled, the claws are smooth and rounded, so that they can, if necessary, be readily withdrawn. The animals on which it feeds live in the water, ordinarily beyond its reach, coming occasionally to the surface. The bird, therefore, has a comparatively slender form, with very long wings, to enable it to remain without fatigue sailing or hovering over the water, until an opportunity of pouncing occurs. To prevent its plumage being injured by its sudden immersion in the water, the feathers of the lower surface are rather more

compact, and considerably shorter, than in eagles and most other birds of the family, and those of the leg are short all round, while most other species have a large tuft of soft feathers on the outer side of the tibia. On the upper parts, again, the plumage is not more compact than in other species, there being no purpose to be answered by such an arrangement. The structure of the wing is peculiarly worthy of study. Hawks having long wings, are commonly supposed to have a more rapid flight than those with short wings; but this is not always the case, for the flight of the short-winged sparrow-hawk is certainly as rapid as that of the longer-winged kestrel. The osprey has very long wings, yet its flight is not so rapid as that of the falcons. Length of wing, then, is not of itself an indication of great speed, so much as of the power of easy suspension in the air, and of continued flight. The Osprey requires to hover long over the waters, often over the open sea at some distance from land, sometimes for hours together, before an opportunity of pouncing occurs. Its form, therefore, is as light as is compatible with strength, its wings long and unusually feathered, there being more quills in them than in those of the eagles or other hawks, while the tertiaries are moreover converted into quills. Were the subject properly discussed agreeably to the ideas of those writers who consider a fact or two sufficient to occupy a page, it might be continued through the next sheet; but my method has usually been to avoid verbosity and mere fine writing, than which there cannot be a greater nuisance in natural history.

This bird is commonly named the Osprey, by orni-

thologists at least. In the north of Scotland it is called the Fishing Hawk, in the west the Fishing Eagle. In Gaelic, it is named *an Iolair-uisg* (the Water Eagle); and by the older writers, on account of the white mark on its head and hind-neck, it was usually designated as the Bald Buzzard, or Balbuzzard, a name elegantly Latinized by *Balbusardus*!

Falco Haliaëtus. *Linn. Syst. Nat.* p. 129.

Falco Haliaëtus. *Lath. Ind. Ornith.* vol. i. p. 17.

Osprey. *Mont. Ornith. Dict.*

Aigle Balbuzzard. *Falco Haliaëtus.* *Temm. Man. d'Ornith.*
p. 47.

Osprey. *Pandion Haliaëtus.* *Selby, Illustr.* vol. i. p. 24.

Balbusardus Haliaëtus. *Flem. Brit. Anim.* p. 51.

BUTEO. BUZZARD.

Bill shorter than the head, deeper than broad towards the base, compressed towards the end, strong, with a longish curved tip : upper mandible with a cere of moderate size, its dorsal outline sloping a little and slightly convex as far as the edge of the cere, beyond which it is curved so as to form rather more than the fourth of a circle, the ridge broad and rather flat at the base, narrowed and convex towards the end, the sides sloping and convex, the edges overlapping, with a distinct sharp-edged rounded festoon, behind which is a slighter undulation, and before it a shallow sinus ending in the curve of the tip, which is deflected, subtrigonal, acute, flattish beneath, its lower part almost perpendicular ; lower mandible with the angle medial, broad and rounded, the dorsal line slightly convex, the ridge broadly convex, the sides rounded, the edges sharp, inflected, slightly curved, the tip broad, rounded, with its edges decurved.

Mouth wide ; palate flat ; upper mandible concave within, the lower more deeply so ; the palatal slit defended by acute papillæ, the glottis also papillate behind. Tongue papillate at the base, short, fleshy, slightly concave above, rounded and emarginate at the horny extremity. Œsophagus wide, dilated above the

middle, at the lower part having a glandular enlargement or proventriculus. Stomach oblong, its muscular coat thin; intestine widest at its commencement, nearly uniform in diameter for two-thirds of its length, with two small cæca near the extremity.

Nostrils broadly elliptical, oblique, lateral, near the fore-edge of the cere. Eyes large; eyelids edged with bristly feathers, the upper overhung by a thin projecting plate. Aperture of the ear roundish, rather large.

Head large, flat above; neck short and strong; body full, broad and muscular anteriorly; wings long. Legs of moderate length, strong; tibiæ rather long, and muscular; tarsi strong, roundish, feathered partially or entirely, in the former case having broad scutella before and behind, the sides covered with reticulated angular scales, the tarsal joint scaly. Toes of moderate size, the outer with a pretty large web at the base connecting it with the third; first and second about equal in length and thickness, third much longer, fourth rather longer, but more slender, than the second; all scaly at the base, but covered above with numerous scutella in the rest of their length, beneath tuberculate and papillate. Claws long, curved, tapering, acute, convex above, compressed, flat beneath, those of the first and second toes largest, that of the middle toe with an inner sharp edge.

Plumage soft, but compact and rather glossy above, the margins loose. Cere nearly bare; space between the bill and eye covered with radiating, very small, bristle-pointed feathers, having downy disunited barbs. Feathers of the head narrow and pointed, of the neck

broad and less pointed, of the other parts generally broad and rounded, of the outer part of the tibia elongated. Wings long, broad, rounded, the third or fourth quill longest, the first very short; the primary quills broad, tapering, but rounded at the end, the outer four abruptly cut out on the inner web; the secondary very broad and rounded. Tail of moderate length, ample, rounded, of twelve broad rounded feathers.

The Buzzards, of which our two British species are characteristic examples, are generally birds of rather large or moderate size. In form and plumage they are very intimately allied to the eagles and sea-eagles, as well as in the form of the bill, which is, however, shorter and less deep towards the end, and of the feet, which differ, notwithstanding, in being proportionally less robust, and in having the claws smaller. As to their manners, all that can be said generally is, that they prefer unfrequented moorland, or woodland, or marshy places; usually fly low, and with less rapidity than the falcons and hawks; sail in circles, like the eagles and some other species, and prey on heavy-flying birds, small quadrupeds, reptiles, and even insects. To this may be added, that they are accused of being sluggish and inactive, because, when not hungry, they, like true savages, dose away their time, perched on a tree or a stone, and because they do not shew off by giving chase to pigeons, finches, or swallows, preferring more easily captured prey. The birds, in fact, are not fitted for such headlong flights as falcons, and are satisfied with a sufficiency of food, and when they have no curiosity to satisfy, nor any amusement to engage in, they

naturally take their rest. Buzzards are generally in good condition, however, which proves that they are industrious. Though neither heroes nor sages, they live quite as comfortably, and enjoy life as much as if, like the goshawk, they were to keep the farm-yard in perpetual terror, or, like the eagle, to soar beyond the clouds and, as some persons assert, gaze on the unveiled splendour of the sun, or, "with telescopic eye," look down on the creatures that crawl over the earth's surface.

The genera *Circaetus* and *Harpyia* connect the eagles and osprey with the buzzards, while the *Morphni* would seem to unite them with the asturs. But of the birds that occur in our country, none are intermediate between the eagles and buzzards. The latter genus is composed of many species besides *Buteo vulgaris* and *B. lagopus*,—for example, *B. borealis* and *B. pœcilonotos*,—some of which indicate a transition to the *Circi* or harriers; birds which, however, are generally as distinct from buzzards as any two groups of this family can well be, although some individuals place them together. But, in fact, the affinities of the different groups are so complex, that they can be adduced to sanction any arrangement, linear, circular, ternate, quinate, or nondescript and indescribable; and "strict analysis" can with great ease be made to shew, with the aid of "affinity and analogy," that "all is right."

BUTEO VULGARIS.

COMMON BUZZARD.

OF the old birds, the general colour deep brown, the feathers on the upper parts margined with paler, the lower parts variegated with brownish-white, the tail marked with numerous transverse bands of dark brown and brownish-grey; the cere greenish-yellow, the tarsi feathered anteriorly, nearly half-way down; and with the toes yellow; the bill and claws black. Of the young, the feathers more or less margined with whitish, the lower parts lighter than in the old birds; the upper part of the hind neck with the basal white of the feathers more conspicuous.

MALE.—The Common Buzzard has a less animated appearance than the Golden Eagle, to which, however, it bears a considerable resemblance. Its body is full and compact, its head very large and flattened above, its neck short, its plumage full, its wings long, and when closed, extending nearly to the end of its broad and slightly rounded tail. Its tarsi, which are strong and roundish, are feathered anteriorly and on the sides more than a third down; their bare part has eleven broad scutella anteriorly, a similar series of thirteen behind, and the sides covered with angular scales. The anterior series of scutella terminates without reaching the joint, the fore-part of which is covered with small

scales. The toes are of moderate size, the first and second about equal in length and thickness, the third much longer, the fourth about the length of the second, but more slender, and united at the base with the third by a pretty large web; they are scaly at the base, scutellate above in the rest of their extent; on the first toe are three entire scutella, on the second five, on the third fourteen, on the fourth or outer eight. The claws are rather long, stout, curved, rounded above, flat beneath, compressed, very acute, that of the middle toe with an inner sharp edge, the first and second largest, the third smaller, the fourth by much the least.

The upper and fore part of the cere is bare, but its sides are covered with bristly feathers, which are downy at the base; the space between the bill and eye is pretty closely covered with radiating bristly feathers, slightly downy at the base; the sharp projecting eyebrow bare; the edges of the eyelids furnished with ciliary bristles. The plumage in general is full and soft, but rather compact and glossy above, although the margins are loose. The feathers of the head are small and narrow, those of the neck larger and more rounded, of the other parts broad and rounded; but the plumage has not, as some allege, any decided resemblance to that of the owls, being, in fact, as firm as that of the goshawk, and, in proportion to the size of the birds, as that of the eagles. The outer feathers of the tibiae are elongated; those of its fore and inner parts, and of the tarsus, narrow and blended. The wings are large and rounded; the first four primary quills are abruptly cut out on the inner web, the first six, but more conspicuously the third, fourth, and fifth,

slightly so on the outer ; the fourth quill is longest, the third next in length, the fifth very little shorter, the second intermediate between the fifth and sixth, the first about three inches shorter than the second, and equal to the eighth. The secondary quills, fifteen in number, are very broad, rounded, and rather long. The tail is ample, of moderate length, and slightly rounded.

The bill is black, near the cere greyish-blue, its soft edges yellow ; the cere and bare space over the eye greenish-yellow ; the irides yellowish-brown ; the feet bright yellow, the claws like the bill.

The general colour of the plumage is a fine deep brown, on the back and wings glossy and with purplish reflections. The head and cheeks are deep brown, slightly streaked with yellowish-white, the margins of the feathers being more or less of that colour. On the back and sides of the neck these streaks are more conspicuous, and the bases of the feathers on the upper hind neck are white, that colour becoming apparent only when they are raised. The throat is yellowish-white, with slender streaks of brown. The lower parts may be described as similar to the upper ; but on the lower part of the fore-neck there is more yellowish-white, and on the fore part of the breast many of the feathers are white with several brown central spots on each. The lower surface of the wing is mottled in the same manner. The sides and tibial feathers are deep brown, more or less mottled with light reddish-brown. The abdomen is barred with brown and white, and the lower tail-coverts are yellowish-white, with a spot of pale brown on each. The quills

are of the general colour externally, but darker towards the tip, and on their inner webs towards the base barred with reddish-white, the shafts whitish, excepting towards the end. The tail is marked with ten narrow bars of dark brown alternating with others of pale brownish-grey, the last dark bar much broader, the tips pale reddish-brown, the shafts whitish.

Length 20 inches, extent of wings 48; wing from the flexure $16\frac{1}{4}$, tail 8; bill along the back $1\frac{7}{8}$, to the tip of the lower mandible $1\frac{9}{8}$; tarsus 3; hind toe 1, its claw $1\frac{1}{4}$; second toe $1\frac{1}{2}$, its claw $1\frac{4}{8}$; third toe $1\frac{7}{8}$, its claw $1\frac{1}{2}$; fourth toe $1\frac{2}{8}$, its claw $\frac{3}{4}$.

FEMALE.—The female is considerably larger, but resembles the male in colouring. The following description, which I transcribe from a note-book, with slight omissions, is that of an individual shot in the parish of Towie in Aberdeenshire, in May 1817, by my friend Mr William Craigie.

It bears a great resemblance to the "black eagle" in its figure and plumage, but is proportionally rather more robust, and has a much shorter neck. The general colour is a fine dark brown, with some ferruginous and white. The bill is bluish, tipped with black, short, strong, and much hooked. The cere yellow, tinged with greenish-blue; the soft margins of the bill yellow. The legs and toes are yellow, the claws black. The whole upper surface from the cere to the tail is of a rich brown; on the upper part of the back the feathers are shouldered with light ferruginous, the scapulars and wing-coverts with that colour and white. The primary quills are nearly black, and glossed with purple toward their distal ex-

tremities; the secondaries nearly of the general tint; all with the inner webs edged with white, and barred with a deeper shade of brown. On its inferior surface, the wing is much lighter; there is a white patch including part of the inner webs of the five outer quills; the coverts are beautifully barred with white, their ground-colour being in the more distal deep brown, in the proximal light ferruginous. The tail, which is broad and not very long, is deep brown, barred with ash-colour and ferruginous, or it is marked with alternate bars of brown and brownish-grey, the last dark bar being the broadest, and the feathers tipped with reddish-white. The number of dark bars is nine on the middle, ten on the lateral, feathers. The feathers on the back of the head are pure white at the base. On the lower surface the prevailing colour is brown, of a lighter shade than on the upper; on the breast spotted, on the belly barred, with white; the tibial feathers brown, tipped with ferruginous.

Length $21\frac{1}{2}$ inches, extent of wings 50.

Of another individual, the length 22 inches, to end of wings $19\frac{1}{2}$; extent of wings 52.

VARIATIONS.—Scarcely two Buzzards can be found exactly alike in their colours, so that this species afforded the ornithologists of former times an opportunity of making several out of it. Sometimes the colour of the plumage is a uniform brown; while, on the other hand, individuals are seen nearly white, with brown spots on the central parts of the feathers. The brown varies from chocolate to light yellowish or greyish brown; but middle-aged individuals are generally of a

deep brown above, while their lower parts are more or less variegated with white. Considerable differences are also produced by the fading and wearing of the feathers, as the period of renewal approaches.

HABITS.—The Buzzard seems somehow, no doubt quite unintentionally on his part, to have incurred the displeasure of ornithologists, few of whom have refrained from applying to him the most opprobrious epithets. Were we to credit all that has been said respecting him, we should take him to be a lazy, sleepy, cowardly fellow, who doses away half his time on some old rotten trunk, and who, even when hungry, cannot be persuaded to do more than look about him from his stand, and when some feeble or crippled object comes up, make an undecided plunge after it, or perhaps scramble by the side of a ditch to clutch a sprawling frog, or scratch among cow-dung for beetles and larvæ. For my part, I cannot believe all that has been said to his disadvantage, and having a kind of natural propensity to side with the weaker party, especially if it be the injured one, as it is almost always sure to be, I shall endeavour to reinstate the Buzzard in that respectability which Nature has accorded to him.

In the first place, then, the Buzzard greatly resembles the golden eagle in his mode of flying—much more certainly than the *noble* peregrine, or the *ignoble* kite. Being a robust and therefore heavy bird, he rises with less alertness than either of these species, but with more than the eagle. When on wing he proceeds rather sedately, at no great height, over the ground which he intends to explore, occasionally wheeling, and some-

times balancing himself over a spot. Should he spy a grouse, a young lapwing, a reptile, or a mouse, down he comes upon it, be assured, not exactly like a shot, but with sufficient force and precision to clutch his prey, which he either devours on the spot, or carries off to some safe retreat or convenient station. When not disposed to continue his hunting excursion, he sometimes mounts to a great height, and seems to amuse himself with sailing quietly along in circles, precisely in the manner of an eagle, his wings spread out at right angles to the body, and curved a little upwards. In the autumn of 1832, I was much pleased with the sight of several buzzards sailing in this manner over the upper part of the valley of Moffat Water, on the confines of the counties of Dumfries and Selkirk. At first I took them for eagles, but soon discovered my mistake; and, in fact, at an uncertain distance, one finds it difficult to distinguish the one species from the other. He knows, it is true, that an eagle is larger than a buzzard, but as he cannot with much precision estimate distances in the air, and as the form and flight of the two birds are much alike, a wiser man than a cockney traveller or a fire-side naturalist might note in his journal that he had seen a flight of eagles, when in reality he had seen only buzzards.

When his sailings are over, or his predatory excursions ended, he betakes himself to some retired place, whether the pinnacle of a crag, or the branch of a decayed tree, but more commonly the former, and there doses in quiet, or keeps an eye on what may be passing around him. That he takes his stand in a particular spot, as is alleged by authors, and waits patiently until

his prey comes up, I cannot affirm from observation. This, however, is clear—if his food frequently consists of young hares and rabbits, partridges, frogs and lizards, he may wait long enough on an old tree in a wood before he satisfies his hunger. When on his excursions, he very rarely gives chase to a bird on wing, but prefers pouncing his prey on the ground. He frequently catches beetles and other insects, and contrives to fish up aquatic lizards from the pools and marshes. One which I dissected many years ago had his stomach distended with the last-mentioned animals.

The Common Buzzard is a stationary bird with us, remaining all the year, and seems to occur in most districts of England and Scotland, although it is rarely met with. In the latter country, it prefers wild, hilly regions; but in England, as in France, it is said to occur chiefly in wooded places, where the trees are of considerable height.

The sum of the information respecting his habits afforded by authors is, that he is a dull, stupid, heavy bird, slow in flight, and seldom remaining long on wing, unless in the breeding season, when he soars to a great height. Buffon and Montagu say he never seizes his prey on wing, but contents himself with young hares, rabbits, partridges, and quails, or with frogs, lizards, serpents, and even worms and beetles. According to Willughby, Montagu, and Mr Selby, he also devours moles and mice; and the first of these authors asserts that he does not disdain even cow-dung. "De tout temps," says the *eloquent* Buffon, "on a comparé l'homme grossièrement impudent au milan, et la femme tristement bête à la buse."

PROPAGATION.—In Scotland, the Buzzard forms its nest in rocks, or on the edges of steep scars or beds of torrents; in England, it would seem, in the forks of trees. It sometimes, like the kestrel and sparrowhawk, takes possession of a deserted crow's nest. The only nest that I am qualified to describe was placed on the top of a steep bank or rut of a stream, and was composed of twigs, heath, wool, and some other substances. The eggs, which are two or three, are of a very broad oval form, almost equally rounded at both ends, white, and irregularly marked with patches and spots of pale yellowish-brown, sometimes they are entirely white. The length of one in my possession is $2\frac{1}{4}$, its greatest breadth $1\frac{1}{2}$ inches.

YOUNG FLEDGED.—The young, when fledged, are of a lighter brown on the upper parts than the old birds, most of the feathers margined with paler. The white on the hind-neck is more apparent. The lower parts are brown, the feathers margined with whitish; those of the legs and tarsi variegated with brown and white, as is the abdomen; the lower tail-coverts yellowish, barred with brown. According to authors, the young are not driven away by their parents so soon as those of other hawks, but are allowed to remain in their society, and are assisted by them, for some time after they are able to fly.

PROGRESS TOWARDS MATURITY.—After its first moult the bird assumes a darker brown, the throat becomes streaked with yellowish-white, and the white streaks and markings of the lower parts enlarge. As it ad-

vances in age, the whitish margins of all the feathers enlarge, until at length, in some individuals, the lower parts are nearly white, with an oblong dark mark on each of the feathers. In middle-age, as one may say, the colours are generally as in the individuals described at the head of this article. In the Museum of the University of Edinburgh, there are two birds, in which white is the predominant colour, the sides of the head, the whole under surface, with the exception of some oblong pale brown spots on the neck, and a large proportion of the upper surface, more especially a large patch on the wing-coverts, being of that colour. It would appear, however, that individuals of the same age vary in their colours; at least no one has traced the changes of colour in a satisfactory manner, nor am I able to accomplish the task. The colour of the iris varies from deep brown in the young birds, to light yellowish-brown in the old.

REMARKS.—Besides being generally distributed in Europe, the Common Buzzard occurs in the northern parts of North America, Dr Richardson having found it there. Were the fact not certain, one might find it difficult to conjecture what the *Buteo vulgaris* of the *Fauna Boreali-Americana* might be, for the figure given in Pl. 27, vol. ii., has a head not much more certainly than half the size of what it would be were it that of our Buzzard drawn of the same length. The bars of the tail are much less numerous, there are no posterior plates on the tarsus (although such are mentioned in the description), and the bill is not that of *the* Buzzard, nor even of a Buzzard at all; while the form of the

body, bounded by two of Lavater's lines of beauty, is unlike that of any rapacious bird known to me. The female is also stated as being twenty-six inches long, which is a much larger size than that of any buzzard seen by me.

It also seems very strange that "the smallness of the head and bill is very remarkable," and that it has "a structure of wing which adapts it for more rapid flight than the goshawk."

In many parts of the country this bird is named the Kite, in others the Puttock, but by ornithologists generally it is known as the Common Buzzard. The synonyms, which are numerous, I judge it unnecessary to indicate, contenting myself, as usual, with referring to a few respectable authors.

Falco Buteo. *Linna. Syst. Nat.* vol. i. p. 127.

Falco Buteo. *Lath. Ind. Ornith.* vol. i. p. 23.

Buzzard. *Mont. Ornith. Dict.*

La Buse. Falco Buteo. *Temm. Man. d'Ornith.* p. 63.

Buteo vulgaris. Common Buzzard. *Flem. Brit. Anim.* p. 54.

Common Buzzard. Buteo vulgaris. *Selby, Illustr.* vol. i. p. 55.

BUTEO LAGOPUS.

THE ROUGH-LEGGED BUZZARD.

TARSI feathered in their whole length; tail white in its basal half, the rest brown; a broad patch of brown on the breast.

MALE.—The Rough-legged Buzzard resembles the Common Buzzard in form, and is nearly of the same size; but is easily distinguished from that species by its feathered tarsi, and the other circumstances mentioned above.

The head is very large, flat above, broad and rounded behind; the neck short and strong; the body full and muscular. The bill is comparatively small, its dorsal outline sloping and convex to the edge of the cere, then curved in rather more than the fourth of a circle, its edges with very slight indications of a festoon. The nostrils are large and nearly elliptical, with the upper or anterior end narrower. The toes are covered at the base with angular scales, arranged in transverse series; the first has towards the end four, the second four, the third seven, and the fourth three scutella; the hind toe is shorter and scarcely stronger than the second; the fourth is about the same length, but much more slender; the middle toe considerably longer. The claws are strong, well curved, very acute, that of the

hind toe largest, more compressed, and concave on the sides.

The plumage is very soft, and rather blended. The space between the bill and the eye is closely covered with bristle-pointed feathers, which are downy at the base, (not, as is stated in a laboured description of this bird, "furnished with black hairs, which are disposed in a stelliform manner over a dense covering of white feathers"). The feathers of the head are close and narrow; of the upper parts of the body broad, rounded, and rather compact; of the lower parts longer and rounded; those of the sides and outer part of the tibiae elongated and very soft, of the abdomen remarkably downy, as are the lower tail-coverts. The wings are long, broad, and rounded; the fourth quill longest, the third almost equal, the second shorter than the fourth, the first about the same length as the seventh; the first five slightly cut out on the outer web, the first four more abruptly so on the inner; the secondary quills broad and rounded. The tail is rather long, ample, slightly emarginate and slightly rounded, of twelve broad rounded feathers.

The bill is brownish-black, at the base greyish-blue, its soft margins yellow. The cere and bare part of the eyebrow are pale greenish-yellow; the irides are gamboge-yellow; the toes of a deeper tint, the claws black. The radiating loral bristles are black, their downy bases whitish. The head and neck all round are yellowish-white or cream-colour, streaked with umber-brown, the central part of each feather being of the latter colour. The upper parts in general may be described as being umber-brown, variegated with light reddish-brown

and yellowish-white, the inner margins of the scapulars and some of the wing-coverts being of the latter colours; the concealed plumage of the back of a more uniform brown. The edge of the wing is whitish, and the brown feathers near it are edged with light red. The quills and larger coverts are of the general colour, but the primary quills are much darker towards their tips; the outer webs of the first six or seven quills are tinged with grey, and the base of all is white, that colour being externally apparent on the second, third, fourth, and fifth, and extending farther on the secondary quills. The upper tail-coverts are white, each with a large brown spot. The tail is white to beyond the middle, the rest brown, excepting the tips, which are brownish-white. The neck anteriorly and the fore part of the breast are yellowish-white, with a large spot of brown on each feather. The sides and the middle of the breast are deep brown, the lower surface of the wing is in part white; the nearer coverts yellowish, each with a narrow brown mark, the ends of the primary quills dark brown, and a large patch of the same on the outer coverts. The short plumage of the legs and tarsi pale reddish-yellow, mottled with dusky, the elongated feathers of the legs of a paler tint, each with an oblong brown spot. The abdomen and lower tail-coverts are yellowish-white.

Length 22 inches, extent of wings 50; wing from flexure 17; tail $9\frac{1}{2}$; bill along the back $1\frac{3}{8}$, along the edge of lower mandible $1\frac{7}{8}$; tarsus $2\frac{1}{2}$; hind toe $\frac{9}{16}$, its claw $1\frac{1}{4}$; second toe $\frac{9}{16}$, its claw $1\frac{1}{8}$; third toe $1\frac{9}{16}$, its claw $1\frac{1}{8}$; fourth toe $1\frac{10}{16}$, its claw $\frac{9}{16}$. The wings when closed are about an inch shorter than the tail.

FEMALE.—The female, which is considerably larger, is similar in colouring to the male; but the light-coloured parts are generally of a deeper tint, or light brownish-yellow, and the lower tail-coverts marked with brown spots.

Length 23 inches, extent of wings 51; bill along the back $1\frac{1}{2}$, along the edge of lower mandible $1\frac{9}{12}$; tarsus $2\frac{1}{2}$.

VARIATIONS.—Individuals of this species differ from each other, although not so much as those of the Common Buzzard, yet in a remarkable degree, there being more or less of white or brown, and these colours varying in tint, while the broad patch on the breast differs both in depth of colour and in extent; the tail has sometimes two bars on its brown part, and sometimes has that portion uniform, or merely darker towards the terminal edge. Many other differences might be pointed out; but as I have not been able to examine a great number of individuals killed in Britain, I must leave this task to the general ornithologist. It is very remarkable that this bird, which occurs in North America, and has been described by Mr Audubon and others, should there become ultimately of a nearly uniform chocolate-brown, retaining, however, the peculiar marks on the lower surface of the wing. In this state it was described by Wilson and others as a distinct species, but Mr Audubon, whose specimens I have seen, has clearly shewn it to be the same bird as his Rough-legged Falcon. I am not aware that in this dark plumage the bird has been seen in Britain, although it would appear that it occurs in the northern parts of

the continent, and is by some considered as the young. But certainly the difference between the Black Hawk, so called, and the Rough-legged Falcon in its ordinary state, is not greater in colour than that between a chocolate-brown Common Buzzard, and an individual of the nearly white variety.

HABITS.—The Rough-legged Buzzard is a native of the northern parts of Europe and America, and has not been observed to breed in Britain, individuals merely visiting that country, occasionally in the winter season. Mr Selby, who had an opportunity of observing two individuals which had stationed themselves in his vicinity, seems to be the only British writer who has spoken of their habits from his own observation. "Their flight," he says, "was smooth, but slow, and not unlike that of the Common Buzzard, and they seldom continued for any length of time on the wing. They preyed upon wild ducks and other birds, which they pounced upon the ground; and it would appear that mice and frogs must have constituted a great part of their food, as the remains of both were found in the stomachs of those that were killed."

Temminck informs us, that it frequents the edges of woods in the neighbourhood of marshes and lakes; in autumn and winter is common in the northern parts of Europe; feeds on water-rats, hamsters, moles, young rabbits, leverets, and birds of various kinds, often also on serpents and frogs; and nestles on large trees, laying four eggs, shaded with reddish.

Dr Richardson found it not uncommon in the fur countries of North America; but Mr Audubon did not

observe it in Labrador. According to the latter, it is a sluggish bird, remaining for hours perched on a stake in the low grounds bordering a river or salt-marsh, unless some wounded bird should come in sight, when it pursues it. Its principal food, he continues, is small quadrupeds, frogs, and sometimes birds, and it is more nocturnal than any other hawk found in the United States; its large eyes and downy plumage fitting it, in his opinion, as in Dr Richardson's, for 'twilight excursions.

REMARKS.—The great breadth of the head both in this species and the preceding, becomes especially apparent, when we compare these birds with the Iceland and Peregrine Falcons, which, although equally large birds, have the head much smaller. The Rough-legged Buzzard seems to me to have a more warlike appearance than his brother the Common Buzzard, and I have my suspicions that justice has not been done to him in respect to his courage and rapacity. Like certain other bipeds, however, notwithstanding his boots and whiskers, he may really be less ferocious than he seems to be. Yet as he has the semblance of a brave, and must at all events be a hardy fellow, I cannot be far wrong in placing him next to the *noble* Falcons, which, in form and accoutrements, are much more dashing.

The genus *Pandion* has necessarily been placed after the *Aquilæ* and *Haliaëti*, to both of which it is allied; but *Buteo* being intimately connected with *Aquila*, has been placed after *Pandion*, which ought properly, perhaps, on account of the thickness of its bill, to introduce *Falco*. The latter genus therefore comes next;

and, after all, the robust buzzards are not, in conformation, widely different from the equally robust and more energetic Gyr Falcon and Peregrine, while in the form of their wings they resemble the Goss Hawk, which will follow the Falcons.

Falco lagopus. *Lath. Ind. Ornith.* vol. i. p. 19.

Rough-legged Falcon. *Mont. Ornith. Dict.*

Buse pattue. *Falco lagopus.* *Temm. Man. d'Ornith.* p. 65.

Buteo lagopus. Rough-legged Buzzard. *Flem. Brit. Anim.*
p. 54.

Rough-legged Buzzard. *Buteo lagopus.* *Selby, Illus.* vol. i.
p. 58.

FALCO. FALCON.

BILL short, nearly of equal breadth and depth at the base, compressed towards the end; upper mandible with a broad cere, its dorsal outline convex, the ridge rounded, the sides convex, the edges anteriorly sharp, and overlapping, with a medial festoon, and an anterior dentiform process, the tip trigonal, acute, at its lower part nearly perpendicular to the gape-line; lower mandible with the angle medial, broad, and rounded, the dorsal line convex, the ridge broad and convex, the edges involute, with a rounded notch or sinus on each side near the tip, which is directly truncate.

Mouth wide; palate flat, with two prominent longitudinal lines, which have on their ridge minute papillæ directed backwards; upper mandible nearly flat within, with a prominent central line, the lower deeply concave, with an obscure ridge in the middle; the palatal slit defended by minute acute papillæ, and having behind, on each side, two flat processes fringed with acicular papillæ. Tongue short, fleshy, rounded, emarginate, posteriorly sagittate and papillate. Œsophagus wide, dilated in some degree about the middle, and at its lower part enlarged, thickened, and glandular. Stomach rather large, oblong, the muscular coat thin, the two lateral tendons small but distinct, the middle coat

FALCON.

thin but tough, the inner coat soft without rugæ. Intestine slender, nearly uniform in diameter, and generally having two minute cæca near its terminal dilatation.

Nostrils subbasal, lateral, in the fore part of the cere round, with a central papilla, which is joined by a thin plate to the upper edge. Eyes large, overhung by a thin projecting eyebrow; eyelids generally bare, but edged with bristly feathers. Aperture of the ear round, rather large.

Head large, round, flattened above; neck short, body compact, rather full, muscular, anteriorly broad and deep; wings long. Legs of moderate length, strong; tibiæ rather long and muscular; tarsi short, rounded, covered all round with roundish or angular scales, of which the anterior are larger, broad and sub-hexagonal; toes strong, scutellate above, scabrous and tuberculate beneath, the third and fourth more or less connected at the base by a membrane; the middle toe much longer than the fourth, which exceeds the second; claws curved, tapering, acute, roundish above and on the sides, flat beneath, with two sharp margins, or narrow and channelled, those of the first and second toes largest, that of the middle toe with an inner sharp edge.

Plumage compact on the upper parts, on the abdomen loose and soft. Cere bare, space between the bill and eye covered only with radiating bristly feathers. Feathers of the head generally narrow and short; of the neck longish; of the back and breast broad; of the outer part of the tibiæ elongated. Wings very long, pointed, the second quill longest, the first almost as long; pri-

primaries ten; one or two of the outer abruptly cut out on the inner web towards the end; secondaries generally thirteen, rather long, broad, rounded. Tail long, broad, rounded, of twelve broad feathers.

The genus *Falco* is composed of birds of moderate, or rather small size, eminently adapted for rapine. The larger species prey upon quadrupeds and birds of a size comparatively large, and even sometimes exceeding their own; others feed upon smaller quadrupeds and birds; and the species of smallest bulk upon mice, small passerine birds, and even insects, especially coleoptera. Of compact form, muscular, and furnished with large and pointed wings, with a broad and powerful tail, they possess the means of moving through the air with a rapidity and precision, if not superior to, yet perhaps not excelled by, those of any other group of rapacious birds. It is not the mere length of wing, however, nor yet its pointed form, that give them this superiority, but their muscular energy acting upon fitting organs. The birds of the genus *Accipiter*, which have wings of a different form, and are generally less robust, are equally rapid in their motions. The species which occur in Britain being in every respect as characteristic and "typical," to use a phrase continually in the mouths of the ornithologists of the penta-cyclographic school, as any that could be named, it is unnecessary for me to select examples from any other region. The Iceland Falcon, or Gyr Falcon, which Cuvier has severed from the rest, to form of it a subgenus, is not sufficiently separated from the Peregrine and others by any peculiarity of form to merit such a distinction; and

the Kestrel and Merlin, which end the British series, differ from the rest in nothing that could be assumed as a generic character. The different species agree in being remarkably bold and vigorous; but they have each peculiarities of habit which cannot be generalized. Thus, some, when searching for prey, fly in circles, others move in a straight or curving course, and some assume a fixed station in the air, and hover over the ground. On account of their docility, the Falcons, and some of the Hawks, were considered by falconers as "noble birds of prey;" while eagles and other species, being less easily reclaimed, were held to be "ignoble."

Six species are found in Britain: the Iceland Falcon, the Peregrine Falcon, the Hobby, the Merlin, the Kestrel, and the Red-footed Falcon. Of these the rarest are the first and the last. Nothing general can be said as to their haunts, excepting that they, like all birds of the family, reside in wild and unfrequented places, or their nestling, as they rear their young on rocks, in buildings, on trees, or on the ground. It has been stated, as a character of the Falcons, that they almost exclusively prey upon living animals; but so do the Accipitres; nay, the wren, the robin, the flycatcher, the sanderling, the snipe, the guillemot, the gannet,—in short, a multitude of birds, differing greatly from each other in many important circumstances. Some of those generalizations which are applauded by inadequate judges, are merely the result of ignorance and self-sufficiency.

FALCO ISLANDICUS.

THE GYR FALCON.

THE tooth-like process of the bill small, the tail extending about four inches beyond the tips of the wings. The old bird white, with dusky spots, the bill pale blue, the cere and feet yellow; the middle-aged light grey, the feathers white on the edges, the bill and cere pale blue, the feet greyish-blue; the young brownish-grey, the feathers margined with paler, the tail and wings barred with dusky.

ADULT MALE. — The Iceland Falcon, which can scarcely be claimed as a native of Britain, although individuals have now and then been killed in Scotland, and more rarely in England, is remarkable for its great strength and boldness; in which respects, as well as in form, it resembles the Peregrine Falcon. Mr Selby says, he has "never been able to examine a recent specimen on the south of the river Tweed;" but does not say whether he has handled one on the north of it. For my part, I have here to state, that I never examined a recent specimen at all, and those which I have seen were skins or stuffed birds from Greenland, Davis' Straits, Labrador, and the north of Scotland. Nor have I even seen the bird alive, whether free or captive; and therefore what I have to say respecting it must be confined to the mere description of the form and plumage.

In its form this species is full and robust, the neck

shortish, the head rather large and round. The bill is shortish, but very thick and strong, the upper mandible with the edges a little inflected, rather obtuse, with a slight, sometimes obsolete, festoon, the tooth-like process distinct, and rather rounded, the tip trigonal and acute; the lower mandible with the edges involute, the tip directly truncate, the notch rounded. The legs are robust and short; the tarsi, which are feathered more than half way down, have their lower part covered anteriorly with transversely oblong scales, posteriorly with smaller papillar scales; the toes are covered at the base with small scales, in the rest of their upper extent scutellate, scabrous and tuberculate beneath. The second and fourth toes are nearly equal, the hind toe shortest, the third longest, the fourth little longer than the second; the claws are strong, that of the hind toe largest.

The plumage is compact, the feathers distinct; those of the head short and narrow, of the back rounded, of the neck and breast oblong. The wings are long; the second and third quills nearly equal, as are the first and fourth; the first and second sinuated on the inner margin near the end. The wings, when closed, are about four inches shorter than the tail, which is long, straight, slightly rounded, its feathers rounded and acuminate.

The bill is pale blue, the tips blackish; the cere and eyelids livid yellow; the legs bright yellow; the claws black. The general colour of the plumage is white, the shafts of most of the feathers of the upper parts greyish-blue, with a spot of the same on many, and the quills and tail feathers barred with dusky; the throat, abdomen and lower wing-coverts pure white.

FEMALE.—The Female, which is larger, resembles the male in colour, only the spots are broader, especially on the breast and sides. The dimensions of birds in this state I am unable to give from my own inspection. The males, according to Temminck and others, are about twenty-two inches in length, the females two feet or a little more.

VARIATIONS.—Individuals vary in the extent of white, and in the form and size of the dark markings; but as they are very rarely seen in this state, little can be said respecting them. It would appear from the accounts of authors, that ultimately they become almost pure white, and I have seen one which had merely a few small spots of dusky on the upper parts.

HABITS.—The Gyr Falcon, or Iceland Falcon, inhabits the cold regions of both continents, and particularly Iceland, whence it was obtained for the royal falconries. It was more highly esteemed for falconry than any other species, and was employed for the larger sorts of game, such as herons and geese, which it destroyed by rising above them and descending perpendicularly. It does not appear that any writer on British birds has had opportunities of observing its habits. Dr Richardson, who states that it is a constant resident in the Hudson's Bay territories, where it is named the Speckled Partridge Hawk, and the Winterer, gives the following anecdote respecting it:—"In the middle of June 1821, a pair of these birds attacked me, as I was climbing in the vicinity of their nest, which was built on a lofty precipice on the borders of Point Lake, in

latitude $65\frac{1}{2}^{\circ}$. They flew in circles, uttering loud and harsh screams, and alternately stooping with such velocity, that their motion through the air produced a loud rushing noise. They struck their claws within an inch or two of my head. I endeavoured, by keeping the barrel of my gun close to my cheek, and suddenly elevating its muzzle when they were in the act of striking, to ascertain whether they had the power of instantaneously changing the direction of their rapid course, and found that they invariably rose above the obstacle with the quickness of thought, shewing equal acuteness of vision and power of motion."

Mr Audubon, who found it breeding on the coast of Labrador in 1833, states that its flight resembles that of the Peregrine Falcon, but is more elevated and rapid; that, when proceeding directly to a certain point, it seldom sailed, but used a constant beat of the wings; and that, after balancing itself in the air over a puffin standing on the ground near its burrow, it would descend upon it with astonishing rapidity, and shaking its feathers while ascending with its prey, carry it off with the greatest ease. Mr Jones, who had been a resident in Labrador for twenty years, informed him that this species, which the fishermen called the Duck Hawk, destroys there an immense number of hares, rock partridges, and willow grouse.

PROPAGATION.—The Gyr-Falcon, according to the authors mentioned above, breeds in the inaccessible parts of rocks; but I am not aware that any person has described its nest or eggs from personal observation. Dr Fleming, whose short account of this species seems

borrowed from Temminck, says that it "lays from 3. to 5 spotted eggs of the size of a ptarmigan;" but he does not state that he has seen its eggs; and if he has not, he could not have acted more judiciously in the way of guessing as to number and marking, for most hawks' eggs are spotted, and "from 3 to 5" is a very general character. The printer, doubtless, has erred as to the size, for the ostrich is the only bird whose egg can be said to be "of the size of a ptarmigan."

YOUNG.—The young, when fledged, has the bill and cere pale blue, the irides brownish-black, the feet greyish-blue, the claws dusky. The general colour of the plumage above is grey tinged with brown, each feather having a very narrow margin of paler, and with some whitish spots towards the end; the quills are mottled with brownish-white on the inner webs, and the tail is transversely barred with thirteen rows of transversely oblong spots of brownish-white, of which colour also are the tips. The lower parts are brownish-white, the throat with longitudinal streaks, the breast and sides with patches of dark brown; the lower wing and tail-coverts barred with brown and white.

In the young state, the species has been beautifully figured and minutely described by Mr Audubon,—Plate *excvi.* and *vol. ii.* p. 552. The individuals represented by him were apparently in their second year, and were supposed to have reared a brood. From the perfection of their plumage, which was such that the tail-feathers had not even lost their minute acumination by rubbing, I should be inclined to think that the two birds ob-

tained by him, and of which I have seen one, were young of the previous season, which had just completed their moult.

The dimensions of the male were: "Length $22\frac{1}{2}$ inches, extent of wings 49; bill along the ridge $1\frac{1}{2}$, along the edge $1\frac{1}{2}$; tarsus 2."

Those of the female: "Length 24 inches, extent of wings 48; bill $1\frac{1}{2}$; tarsus 2."

PROGRESS TOWARDS MATURITY.—At the second moult, the general colour of the plumage is brownish-grey, of a uniform tint, but all the feathers are more or less variegated with whitish spots at the end and along the margins; the quills and tail-feathers are barred with grey. By degrees the white markings enlarge, leaving only a central spot or streak of grey on the feathers, and the dark bars on the quills and tail diminish, until by the fifth or sixth year the bird assumes the appearance described above as characterizing the adult. The progress towards maturity, however, as here traced, is merely stated from analogy, for although I have seen birds in different stages, I have not observed the changes of an individual.

REMARKS.—The Iceland or Gyr Falcon can be regarded only as an occasional visitant, for it does not appear that it has been observed to breed in any part of Britain; nor, I believe, have adult or white individuals been seen there. Cuvier, in his *Regne Animal*, has instituted a separate genus, *Hierofalco*, for this bird, on the ground that its bill "has merely a festoon like that of the ignoble birds of prey;" but the toothlike

process is often well formed, and, on the other hand, the festoon is often wanting or indistinct; and the bird in question is so nearly allied to the Peregrine Falcon in form and proportions, that there seems to me no reason whatever for separating it from the falcons. The same author, by one of his frequent mistakes, cites the *F. atricapillus* of Wilson, which is nothing but the common goshawk, or a bird most closely allied to it, as a species of the same genus.

The variations exhibited by the bill, with respect to the festoon and tooth-like process on the edges of its upper mandible, are very remarkable, although not altogether anomalous. It is not, however, quite certain that this species may not, when more accurately examined, be found to be formed of two. Should it prove otherwise, the absence or presence of the tooth in the same species must tend to shew that its uses are not yet properly understood. In all young birds of this genus, that I have examined, it is at first obsolete or small, and gradually enlarges.

Falco rusticolus. *Linn. Syst. Nat.* vol. i. p. 125. Nearly adult.

Falco Gyrfalco. *Linn. Syst. Nat.* vol. i. p. 130. Young.

Falco islandicus candicans. *Lath. Ind. Ornith.* vol. i. p. 32. Old.

Falco rusticolus. *Lath. Ind. Ornith.* vol. i. p. 28. Nearly adult.

Falco Gyrfalco. *Lath. Ind. Ornith.* vol. i. p. 32. Young.

Faucon Gerfault. *Falco islandicus.* *Temm. Man. d'Ornith.* p. 17.

Jer-Falcon. *Falco islandicus.* *Selby, Illust.* vol. i. p. 36.

Gyrfalco candicans. *Flem. Brit. Anim.* p. 51.

FALCO PEREGRINUS.

THE PEREGRINE FALCON.

Wings, when closed, of nearly the same length as the tail. Of the adult male, the upper parts dark bluish-grey, the head blackish, the lower parts white, the breast transversely spotted. Of the female, the upper parts tinged with brown, the lower yellowish-white, with the markings larger. Of the young, the back blackish-brown, the breast pale yellowish-red with broad longitudinal markings. In all stages, a large dark brown or blackish mystachial patch.

MALE.—The Peregrine Falcon, which, although inferior in size to the Iceland Falcon, bears a great resemblance to it in form, and was held in nearly equal estimation as a hunting hawk, is a permanent resident, and occurs in many parts of Britain, but more especially in the northern parts of Scotland, and in its islands. The history of this species has been singularly mystified by the older writers, who, on account of the variations which its plumage exhibits in the progress towards maturity, would have it split into several distinct species. The error, however, has been rectified; and it is now quite absurd to cumber a terminology already sufficiently complex, and moreover perpetually changing, with the "trail" of exploded notions. In form the species is full and robust, its neck rather short, its head large and round. The bill is

shortish, thick, and strong; the upper mandible with the edges sharp, slightly inflected, with a distinct process toward the curvature, having on either side a rounded sinus, the tip trigonal, descending obliquely, and acute; the lower mandible involute at the edges, the tip directly truncate, the notch distinct. The legs are robust and short; the tarsi, which are feathered more than half-way down, are covered all round with reticularly arranged scales, the anterior larger, broad, and subhexagonal, the posterior small and rounded; the toes are robust, covered above with scutella, scabrous and tubercular beneath; the second and fourth toes are nearly equal, the hind toe shortest, the third longest, the third and fourth connected by a membrane at the base. On the first toe are six, on the second nine, on the third seventeen, on the fourth ten scutella. The claws strong, rounded on the ridge, rather compressed, acute, narrow, and marginate beneath.

The plumage is compact on the upper parts, firmer and stronger than in any other British bird of the family; the feathers of the back rounded, of the neck and breast anteriorly broad and rounded, of the sides long, all acuminate; of the tibiae long and rounded. The space between the bill and the eye with bristle-tipped feathers. Wings very long and pointed; primary quills of moderate breadth, attenuated towards the end, the first quill with a sinus near the end internally, the second longest, the first a little shorter, the third nearly as long as the first; secondaries thirteen, curved inwards, broad, obtuse with an acumen. Tail about half an inch longer than the closed wings, slightly rounded, the feathers broad and rounded.

PEREGRINE FALCON.

The bill is blackish-blue at the tip, pale blue at the base, the cere oil-green, the bare orbital space orange, the irides dark hazel, the feet lemon-yellow, the claws brownish-black. The head, and hind parts and sides of the neck, are greyish-black tinged with blue; the rest of the upper parts deep bluish-grey, gradually fading into ash-grey behind; the feathers of the back, wing-coverts, and upper tail-coverts, all more or less distinctly barred with greyish-black. The quills are blackish-brown, their inner webs marked with transverse elliptical spots of reddish-white. The tail is marked with about twelve bars of blackish-brown, the last of which is broad, the rest diminishing in size and intensity of tint, the intervals light bluish-grey, the tips brownish-white. The throat and fore neck are white; a broad band of a blackish hue, from the angle of the mouth downwards; the cheeks whitish-grey; the breast white, with longitudinal lines and triangular spots; the sides ash-grey, longitudinally lined and transversely banded; the tibial feathers ash-grey, transversely banded, as well as the abdominal feathers and lower tail-coverts. The bars on the feathers of the lower parts vary from two to seven, those on the fore part of the breast having two, on the sides five, some of the lower tail-coverts six, the axillar feathers seven. The lower wing-coverts whitish and transversely barred.

Length to end of tail $16\frac{1}{2}$ inches, to end of wings 16; extent of wings 36; wing from flexure $12\frac{1}{4}$; tail $7\frac{1}{4}$; bill along the back $1\frac{2}{12}$, along the edge of lower mandible $1\frac{2}{12}$; tarsus $1\frac{3}{4}$; hind toe $1\frac{0}{12}$, its claw $1\frac{1}{12}$; second $1\frac{3}{12}$, its claw $1\frac{0}{12}$; third 2, its claw $1\frac{0}{12}$; fourth or outer $1\frac{1}{2}$, its claw $\frac{8}{12}$.

FEMALE.—The female, which is always much larger than the male, is further distinguished by the tints and markings of the plumage. The bare parts and irides are as in the male. The head, the hind part and sides of the neck, the back and wings, are deep greyish-brown; the feathers of the upper hind neck reddish-white at the base, of the other parts ash-grey; the back and wing-coverts indistinctly barred with grey; the rump is ash-grey, broadly barred with greyish-brown. The greater coverts are blackish-brown, the primary coverts barred with grey on the outer web; with spots of reddish-white on the inner; the quills of the same colour, indistinctly marked with spots of ash-grey on the outer webs, on the inner with transverse elliptical spots of cream-colour; the tips of the secondaries whitish. The tail has eighteen alternate bars of ash-grey and deep brown, the latter broadest, the tip brownish-white. The throat and fore neck are yellowish-white, with longitudinal lines of deep brown; the mystachial band is dark brown; the breast brownish-white, with transverse bars of deep brown, as are the lower wing-coverts and tibiae; the abdominal feathers redder, with the bars less distinct; those on the lower tail-coverts narrow.

Length to end of tail $21\frac{1}{2}$ inches, to end of wings $20\frac{2}{3}$; extent of wings 45; wing from flexure $13\frac{1}{2}$; tail 12; bill along the back $1\frac{4}{8}$, along the edge of lower mandible $1\frac{3}{8}$; tarsus $2\frac{1}{4}$; hind toe $1\frac{1}{2}$, its claw $1\frac{1}{4}$; second toe $1\frac{4}{8}$, its claw $1\frac{1}{2}$; third toe $3\frac{1}{4}$, its claw 1; fourth or outer toe $1\frac{7}{8}$, its claw $1\frac{0}{8}$.

VARIATIONS.—The males vary in length from fifteen

to eighteen inches, the females from nineteen to twenty-three; so that in this species the sexes differ more than in most others. The differences in the tints and markings are also very considerable, although not such that one who had studied the form and general appearance of a pair, could hesitate in recognising any individual of the species. Adult males vary but slightly. The head varies from greyish-black to brownish-black; the bluish-grey of the back is deeper or lighter; sometimes the upper part only, sometimes nearly the whole of the fore neck is white, without spots. The older the individual the smaller the spots and bars, and the more decided the ash-grey of the hind lower parts. The females vary from greyish-brown to brownish-grey, or even to bluish-grey on their upper parts, which are generally less distinctly barred than in the males. The lower parts are generally yellowish or brownish-white, and have very little of a grey tinge behind. Their markings, which are generally larger than in the male, do not vary materially.

HABITS.—The Peregrine Falcon, being a very powerful bird, possessed of great courage and activity,

“ For feat of strength or exercise,
Shaped in proportion fair,”

and withal docile and easily reclaimed, was a great favourite with the “warrior kings,” “proud earls,” “barons bold,” and nobles of all degrees, in the happy days of old, when the iron-cased knight and his squires went about dealing out their dole of christian charity to their fellow creatures.

“ Behind him rode two gallant squires,
 Of noble name, and knightly sires ;—
 Four men-at-arms came at their backs.
 With halbert, bill, and battle-axe ;—
 Last, twenty yeomen, two and two.
 In hosen black, and jerkins blue,
 With falcons broidered on each breast.”

But the career of the mailed maulers has long ago terminated, and the falconers have been converted into cotton-spinners, although the world is not much better than before. Even at the present day, however, a few tamed falcons may be found in the land, although no man bent on slaughter would exchange a double-barrelled Manton, with its appurtenances, for a whole covey of kites, kestrels, and peregrines, with hoods and bells to the bargain.

The direct flight of the peregrine falcon, which is extremely rapid, is performed by quick beats of the wing, and is very similar to that of the rock pigeon. When proceeding in haste from its breeding place or roosting station towards a distant part of the country, it very seldom sails, or moves forward at intervals with extended wings ; but when sauntering as it were about its retreat, it employs both modes of flight, as it also does, in common with many other hawks, when searching for prey. Yet it is hardly ever seen to float or sail along in circles, as eagles, buzzards, and harriers are wont to do, but performs its short gyrations as if in haste, and the moment an opportunity occurs, comes down upon its prey, either in a curved sweep, or like a stone falling from the air.

Its food consists of birds of moderate size, such as red grouse, partridges, plovers, ducks, auks, guillemots,

and small gulls, which it pursues in open flight, or pounces upon by perpendicular descent. It is also said to attack small quadrupeds, such as rabbits and hares; but its favourite game is grouse and water-fowl. Poultry are very rarely molested by this falcon, which is by no means so ready to visit the farm-yard or its vicinity, as several other species of the family. In raising birds from the water, should they prove too heavy, it sometimes drops them, and sets out in quest of others; yet it is capable of carrying a weight nearly equal to its own, for the keeper of the Bass Rock informed me that he once found a black grouse in a peregrine's nest, which it had probably borne from a distance of several miles.

Although a very shy and vigilant bird, it sometimes ventures to come into more immediate proximity to man than is prudent. Mr Audubon states, that, in America, he has seen it fly up "at the report of a gun, and carry off a teal not thirty steps distant from the sportsman who had killed it, with a daring assurance as surprising as unexpected." Mr Selby also gives an anecdote exemplifying its boldness and perseverance. "In exercising my dogs upon the moors, previous to the commencement of the shooting season, I observed a large bird of the hawk genus hovering at a distance, which, upon approaching, I knew to be a Peregrine Falcon. Its attention was now drawn towards the dogs, and it accompanied them whilst they beat the surrounding ground. Upon their having found and sprung a brood of grouse, the falcon immediately gave chase, and struck a young bird, before they had proceeded far upon wing. My shouts and rapid advance prevent-

ed it from securing its prey. The issue of this attempt, however, did not deter the falcon from watching our subsequent movements, and another opportunity soon offering, it again gave chase, and struck down two birds by two rapidly repeated blows, one of which it secured and bore off in triumph."

The cry of the peregrine falcon is loud and shrill, but is seldom heard, excepting during the earlier part of the breeding season. It nestles on high cliffs, especially those along the coast, and to places of this description exclusively it seems to resort for the purpose of reposing, although some writers state that it rests and even breeds in towers and steeples. When perched upon a rock, or flying across its face, it does not present so imposing an object as one might imagine from viewing a stuffed skin in a museum, for the grey colour of its upper parts blends with the tints of the stone, and its sharp wings and rapid flight have the effect of rendering its apparent size much less than that of the buzzard.

It is pretty generally distributed, but prefers mountainous or rocky situations. In the winter season, however, it sometimes resorts to the low grounds; but still, as thirty or forty miles are a very small distance to a bird which is supposed to be capable of flying at the rate of sixty or more miles in an hour, it may in those cases retire at night to rocks. Whether in this country individuals are partially or entirely migratory is unknown. Those of the northern parts of Scotland may possibly proceed southward in autumn, but on the Bass Rock, in the Frith of Forth, the birds which breed there are said to remain all winter. It has been seen

in the Shetland and Orkney Islands, and in Sutherland. It is also occasionally, though very rarely, found on the cliffs of the Hebrides. The rock of Dumbarton Castle formerly afforded a breeding place to it, as did the Isle of May, and the Bass Rock. Along the east coast of Scotland there are few rocks of great height or extent on which it does not breed. Sir William Jardine states that the Vale of Moffat, in Dumfriesshire, is one of the most favourite stations he is aware of, many pairs breeding there, and on the confines of Selkirkshire. On one of my visits to the rock of the Grey Mare's Tail, a celebrated waterfall, in the upper part of the district just mentioned, I saw a single peregrine fly off from its face. Messrs Sheppard and Whitear, in the Linnean Society's Transactions, vol. xv., mention its occurrence in Norfolk and Suffolk. According to Pennant, the rock of Llandedno, in Caernarvonshire, was "famous for producing a generous breed." In short, as I have stated, it is pretty generally distributed along the coast; but, excepting the neighbourhood of those cliffs in which it breeds, it is seldom seen, and, in fact, as to number, it may be considered as one of our rarer species. Opportunities of observing its habits are therefore of unfrequent occurrence, and unless I were to invoke the aid of fancy, I could add very little to what I have said respecting its manners. But as peregrines are associated with maritime rocks, and these with guillemots and gannets, I may be allowed to enliven my narrative with a brief description of the Bass, more especially as it will afford me an opportunity of recording some facts not previously noticed.

In the middle of August 1835, while collecting

materials for this work, I accompanied Mr Audubon to the Bass Rock, he having the gannets more particularly in view, and I the peregrines. How we were conveyed to North Berwick, how many rabbits we saw on Guillon Hill, and what esculents were demolished by us at the inn, it is not altogether necessary to state. The lobster-traps, mackerel baskets, and lazy fishermen, we saw at Canty Bay; the alternations of trap and sandstone on the coast, with Mr Maclaren exploring their phenomena; the burntup herbage, and the beautiful tufts of *Eryngium maritimum*, with all the other wonders of the place, including the cone-shaped Law, and the reapers from the Green Isle, may be safely passed over in silence. But now, at six in the morning, see us in a well-manned boat, skimming lightly over the smooth sea, in the direction of the gaunt rock of the gannets. We had proceeded about a mile, little, excepting a few cormorants and curlews, having attracted our attention, when

———"sudden, close before us, show'd

His towers Tantallon vast;
 Broad, massive, high, and stretching far,
 And held impregnable in war.
 On a projecting rock they rose,
 And round three sides the ocean flows,
 The fourth did battled walls enclose,
 And double mound and fosse."

So sung the border bard; but Tantallon is now a breeding-place for jackdaws, runaway pigeons, and kestrels, and its old stones are probably as well employed in this capacity as in harbouring thieves and barons. Having taken up another hand at Canty Bay, we proceed-

ed towards the rock, questioning the steersman as to his knowledge of ornithology. He informed us that a pair of hawks have annually bred on the Bass from time immemorial, to his own knowledge for the last nineteen years. It is not, however, to be supposed that the same pair continues for many years in succession; for I have seen two peregrines that were shot on the rock in 1826. Sometimes, but rarely, the young are carried off, in which case the birds nestle the following year in a different station. This year, according to my informant, the nest contained three young, of which two were taken out for a gentleman in Berwick, who gave half-a-guinea for each, while the third made its escape. The nest is composed entirely of dry grass, and is placed towards the summit of the cliff. The birds carried to it by the falcons to feed the young are, according to my informant, auks, guillemots, kittiwakes, various other sea birds, plovers, pigeons, and especially red grouse. Once he found a black cock in it, at which he was not a little surprised.

Softly and steadily scuds the bark before the gentle breeze, which scarcely ruffles the smooth surface of the waters, the thin vapours float over the face of the ocean, the air is soft and warm, and now we perceive the gannets flying along the cliffs. In a little while we reach the landing place, disembark, and betake ourselves to the low point to look at the birds in the precipice that fronts Tantallon on the opposite coast. Having made our observations, we pass through the ruins of the fortifications, ascend to the summit of the rock by a winding path, pause by the way to look at the phalanx of gannets breeding on the steep slope, and which are

seen from the coast as a white spot; continue our observations on the top, and, having noted all that we observe, return to the boat, and row round the island, shooting at the kittiwakes. It being the 19th of August, the auks, guillemots, and puffins were all off with their young, and scattered over the sea. The young gannets were not yet able to fly, and many of the kittiwakes still remained. Mr Audubon took with him two of the former, and shot a good number of the latter; but the cormorants, which he was anxious to see, had all been shot in spring; and no rock pigeons were observed. I had visited the rock before, on the 13th May 1831, accompanied by my wife, whose praises must not be sung by me, and my esteemed friends William Brand and William Stables, Esquires. I am, therefore, enabled to present you with an account of its wonders.

The Bass is an abrupt rock, having a basis of about a mile in circumference, and of an oblong form. The cliffs are perpendicular in some places, overhanging in others, and everywhere precipitous, excepting at the narrow extremity next the land, where, sloping less abruptly, they form at the base a low projection, on which is the only landing place. Above this are the ruins of the fortifications and houses, the Bass having formerly been used as a state prison. The rocks are in some places apparently two hundred feet in height, and the summit, towards which the surface rises in an irregular manner, is probably a hundred and fifty feet higher. In as far as I observed, the whole mass is of a uniform structure, consisting of trap, intermediate between greenstone and clinkstone, with an uneven

fracture, approaching to conchoidal, sometimes splintery; glimmering lustre; dull brownish-red colour, with specks of dull pale green interspersed; and small granular structure. It is scratched by the knife without difficulty, tough and hard under the hammer. The seams have a dark-red rusty appearance, sometimes tinged with dull brownish-black. Felspar and augite are the constituent minerals, the latter in small quantity. The lustre and texture are similar to those of the rock of North Berwick Law, but the colour of the latter is greenish-grey, with interspersed patches of reddish-brown.

Although a great portion of the upper surface of the island is composed of rock, there is an abundant vegetation, consisting chiefly of *Festuca ovina*, *F. duriuscula*, and a few other grasses, mixed with the plants usually found in maritime situations. In a place formerly occupied as a garden, there is abundance of *Narcissus biflorus* and *N. poeticus*, which, of course, cannot be supposed to be indigenous. Among other plants, the following were observed by me:—*Silene maritima*, *Cochlearia officinalis*, *Plantago coronopus*, *Lychnis dioica*, *Geranium molle*, *Statice armeria*, *Draba verna*, *Urtica dioica*, *Rumex crispus*, *Sonchus oleraceus*, *Leontodon Taraxacum*, *Vicia lathyroides*, *Viola canina*, *Bellis perennis*, *Lycopsis arvensis*, *Myosotis collina*, *Cerastium semidecandrum*, *Luzula campestris*, *Bromus mollis*, *Aira præcox*, and, lastly, *Lavatera arborea* and *Beta maritima*, the two latter growing in great abundance among the ruins, which harbour great numbers of *Helix aspersa*.

But the circumstance connected with the Bass most

interesting to the zoologist, is its being one of the few places in Britain to which the gannet resorts during the breeding season. The number which I saw might be estimated at twenty thousand ; every part of the mural faces of the rock, especially towards their summits, was more or less covered by them. In one spot near the landing place, about forty yards in circumference, and on a gentle slope of gravelly ground, about three hundred individuals were sitting on their nests at the period of my first visit.

The gannets arrive about the middle of February or the beginning of March, and depart in October ; some years a few individuals remain during the winter. The nests are composed of grass and sea-weeds, generally placed on the bare rock or earth, elevated in the form of a truncated cone, of which the base is about twenty inches in diameter, with a shallow terminal cavity. On the summit of the island are numerous holes in the turf, from eight to fifteen inches deep, and from six to nine broad, formed by the gannets in pulling away grass and turf for their nests. They are placed on all parts of the rocks where a convenient spot occurs, but are much more numerous towards the summit. Some of them on the face of the rock, or in a shallow fissure, and which have been occupied for years, are piled up to the height of from three to five feet, but in this case they always lean against the rock. The egg, which is solitary, and presents nothing remarkable in its position, is of an elongated oval form, bluish-white, dull, with a chalky surface, usually patched with yellowish-brown dirt. It is subjected to what might appear rough usage, for the bird in alighting, flying off, or when disturbed

by the intrusion of human visitors, tumbles it about, and often stands upon it.

When sitting, the gannets usually allow a person to approach within three feet, sometimes much nearer, so that one may even touch them. When one approaches them, they merely open their bill, and utter their usual cry, or they rise and express some degree of resentment, but seem to have very little apprehension of danger. They take advantage of the absence of their neighbours to pilfer the materials of their nests. Frequently two join in this act, and occasionally two may be seen tugging at the same bunch, endeavouring to wrest it from each other. They are constantly repairing their nests, which, being composed in a great measure of sea-weeds, shrink up in dry weather, and decompose in wet; and when seated close together they have frequent quarrels. I saw one seize its neighbour by the back of the neck, until the latter, I may say, roared out; but, in general, they are satisfied with menacing each other with open bills and loud clamour. In leaving the nest, they generally scatter about a quantity of the materials of which it is composed, for they are extremely awkward in their motions when on the ground, hobbling and limping along, aiding themselves with their wings, and dragging the abdominal feathers and tail.

In launching from the cliffs, they frequently utter a single plaintive cry, perform a curve, having its concavity upwards, then shake the tail, frequently the whole plumage, draw the feet backwards, placing them close under the tail, on each side, and cover them with the feathers. In some the feet were entirely covered, while

in others parts of the toes were apparent. In flying, the body, tail, neck and bill, are nearly in a straight line, the wings extended and never brought close to the body, and they move by regular flappings, alternating with short sailings. In alighting, they generally ascend in a long curve, keeping their feet spread, and come down rather heavily, often finding it difficult to balance themselves, and sometimes, when the place is very steep, or when another bird attacks them, flying off, to try it a second time. On the rocks they stand with the body nearly horizontal, or they lie on their belly, although some may be seen in an oblique or even nearly erect posture. They usually repose with the head resting between the shoulders, the bill concealed among the feathers of the back. I caught one in that state by walking up to it, and seizing it by the tail and the tips of the wings, which cross each other over it.

Owing to their interference with each other, a constant noise is kept up amongst them. Their cry is hoarse and harsh, and may be expressed by the syllables carra, carra, carra, or kirra, kirra, kirra, sometimes it is cra, cra, cra, or kree, kree, kree, or crac, crac, crac. The cry varies considerably in different individuals, some having a sharper voice than others, and when unusually irritated they repeat it with great rapidity. Some person thinks they cry grog, grog; but neither Mr Audubon nor myself interpreted their notes so, otherwise we could have satisfied a few at least, as we had a bottle of whisky and a keg of water.

The young are at first covered with very beautiful close snow-white down; at the age of about six weeks the feathers make their appearance among the down:

when two months old the birds are pretty well fledged, and at the end of three months they are able to fly. The old bird at first feeds the young with a kind of fish soup prepared in its gullet and stomach, and which it introduces drop by drop as it were into its throat. But when its nursling is pretty well grown, it places its bill within its mouth, and disgorges the fish either entire or in fragments. They never carry fish to the rock in their bills. The smallest number of young killed in a year is a thousand, the greatest two thousand; but in general the number is fifteen or sixteen hundred. After being plucked, they are sold at from ninepence to a shilling each. The price of a young bird for stuffing is two shillings, of an old bird five, of an egg one. For the information contained in this paragraph I am indebted to the keeper.

At the period of my second visit with Mr Audubon, the nests in most places had almost entirely disappeared, for it is only during incubation that the birds keep them in constant repair. The young were in various stages, a few quite small and covered all over with white down, the greater number partially fledged, with the down remaining on the head and neck, and some nearly ready to fly, and having merely a few tufts of down on the hind neck. The young lay flat, either on the remnants of the nest, or on the bare rock or ground. They are very patient and uncomplaining; in fact, none uttered a single cry while we were inspecting them. I observed an old bird, with its own young beside it, squeeze the neck of another youngling with considerable force. The poor bird bore the persecution with perfect resignation, and merely cowered under the bill

of the tyrant. The young of the latter also attacked its neighbour, but was instantly checked, on which it meekly desisted. One of the men informed me that last year there were fourteen nests, each with two eggs. In such cases, one of the young is said to be much smaller than the other. The description of the gannet, its mode of capturing its prey, the structure of its intestinal canal, and other particulars respecting it, I must leave for another occasion.

The Bass is not remarkable for the number or variety of other species of birds that resort to it. Those which I observed there were: *Alca Torda*, *Mormon Fratercula*, *Uria Troile*, *Larus marinus*, *L. argentatus*, *L. tridactylus*, *Carbo cristatus*, *Tringa maritima*. Besides these sea birds, the raven, the jackdaw, the domestic pigeon, the common titlark, and the wheatear, breed there. The peregrine falcon, like a feudal baron, lords it over the rocky isle, forming his nest on the face of the precipices, and preying upon the young birds. At my first visit I had the good fortune to see the two old birds, and on my second the young one which had escaped when its brethren were carried into captivity. One of the men pointed out the spot in which the nest had been, and which he described as being flat, and composed entirely of grass.

Having ended our observations, we proceeded towards North Berwick. In the course of our voyage, Mr Audubon shot a number of kittiwakes and auks, but my own exploits not being remarkable, I need not trouble you with an account of them. Although the weather was very close and hot, we walked to Mussel-

burgh, observing by the way the manners of rabbits, rooks, and Anglo-Saxons.

In addition to the information respecting the peregrine falcon, as observed in North America, contained in the first volume of the "Ornithological Biography," Mr Audubon has favoured me with the following notes, taken since the publication of that volume.

"Although I have never found this species breeding in the middle districts of the Union, I saw it on the Florida Keys, in May and June, or about the period at which, in the following year, I found many pairs with eggs and young on the coasts of Labrador. I imagine that those seen in the Floridas in summer must have bred on the more elevated rocky shores of the island of Cuba, or were sterile individuals. The former opinion is the more likely, that the birds were in pairs, and after seizing the young of the white-headed pigeons, just able to fly, made off in the direction of the island mentioned, bearing their prey in their talons, which, had they not intended it for their young, they would have in all probability devoured on the spot, as is their usual manner when without young.

"The notion that the peregrine falcon breeds in deep swamps, and on tall trees, amid herons, as held by the editor of the reprint of Wilson's American Ornithology, is, I think, without foundation; for were this the case, I could not easily have failed in meeting with its nest, in the course of my many journeys through our swamps and woods. I have never seen a nest of this species on a tree, but have always found it placed on the shelf of some high rock overhanging the sea, or at farthest in view of it, and generally towards the summit of the

rock. At Labrador, where seven or eight nests were examined, I found them formed of sticks, sea-weeds, and bunches of hair of different quadrupeds, especially of the rein-deer. They were flat, and looked more like a mattress than a proper nest. The eggs never exceeded four, and more frequently were only two. The remains of prey about the nests, and at the foot of the rocks, were portions of willow grouse, Canada grouse, young hares, fish, and young gulls of the larger species. The fish they procured in great abundance along the shores, but rarely picked up any very large ones, the kind selected being usually codlings of eight or nine inches in length.

“ During the winter months, this species is found in the interior of the United States more frequently than along the sea-shore, and may be said to be then common on the Ohio and Mississippi, where the numerous kinds of ducks found there at that season furnish them with an abundant supply of food. But in those regions I never observed one attacking a quadruped of any sort, or even committing depredations on the poultry, although they are extremely expert in seizing tame pigeons.

“ I have rarely crossed the Atlantic without observing this bird, sometimes at a great distance from land; and on account of its easy manner of flight on such occasions, I conceive the peregrine to be a bird capable of more protracted flight than any with which I am acquainted, not excepting even the passenger pigeon. While passing across the Gulf of Mexico in the month of May, I saw a pair give chase to two kingfishers, flying apparently from Cape Florida to-

wards Cape Lookout. The falcons very soon overtook the fugitives, and grappled them, but, to my surprise, all fell into the sea and were drowned. I had a distinct view of all this, as had the officers of the United States' revenue cutter the Marion. The weather was fine, and the breeze only moderate, so that I cannot account for the fact, as the peregrine is fully able to carry a willow grouse or a teal in its talons to a great distance, apparently without much trouble."

PROPAGATION.—The Peregrine Falcon begins to breed early in spring. Its nest is with us always placed on the shelf or in the crevice of a rock. The eggs, which are two, three, or four in number, are of a short elliptical form, dull light red, spotted and blotched with deep red. Their average length is two inches and one-twelfth, their greatest breadth one and seven-twelfths; their form broadly elliptical. The young, which are at first covered with close white down, are able to fly by the middle of July.

YOUNG BIRD FLEDGED.—The young, when fully fledged, have the bill of a dull pale blue, the tips darker, the cere and bare space about the eye of a livid blue, the irides blackish-brown, the feet greyish-yellow. The forehead and cheeks yellowish-white; the upper parts generally brownish-black shaded with grey, the feathers edged with pale brown; the upper part of the neck behind yellowish-white spotted with dusky. The quills and tail are blackish-brown, the former spotted with brownish-white on the inner web and tipped with the same, the latter marked with brownish-red bars. The

throat is whitish, the mystachial band blackish-brown, proportionally more pointed than in the adult; the lower parts reddish-white, with large longitudinal dark brown markings, the central part of each feather being of that colour.

PROGRESS TOWARDS MATURITY.—As the birds advance in age, the plumage on the upper parts becomes of a lighter tint, more tinged with blue; that of the lower parts whiter, with the dark markings smaller, and more guttiform, and instead of being longitudinal assuming a transverse direction. Considerable variations are thus produced, which to persons accustomed to look chiefly to colour for specific distinctions, might seem sufficient to mark out distinct species. The only permanent character in all stages, M. Temminck remarks, is the broad mystachial dark brown band; but a person accustomed to compare birds in different states, can have no difficulty in distinguishing a peregrine of any age, or of either sex.

REMARKS.—The peregrine falcon affords a good example of one of the more remarkable varieties of the flight of birds. Those which have the body bulky, the wings short and rounded, as the grouse and water ouzel, have a direct flight, not in general rapid; those which have the body full, the wings long and sharp, have also a direct steady flight, but generally rapid, as is the case with our falcon and the rock pigeon. Birds having the body light and the wings short, as the Gallinules, also fly steadily, but with comparatively little speed; when the wings are large and broad, as in the heron, the

flight is sedate, and capable of being long protracted; when the wings are very long and rather narrow, it is unsteady and undulating, as in some owls and gulls; and when the body is very slender, and the wings extremely long, there is produced that unsteady, bounding, and gliding flight, so remarkable in the terns.

This species is very widely distributed, being found, according to authors, in most parts of Europe, over the whole of North America, in the southern division of that continent, and in New Holland. The various names given to it are Peregrine Falcon, Tartarian Falcon, Spotted Falcon, Barbary Falcon, Haggard Falcon, Red Indian Falcon, Wandering Falcon, Common Falcon, Grey Falcon, and Grey Hawk, by which latter name it is commonly known by the country people.

Falco peregrinus. *Lath. Ind. Ornith.* vol. i. p. 33. Old.

Falco communis. *Lath. Ind. Ornith.* vol. i. p. 30. Young.

Faucon Pelerin. *Falco peregrinus.* *Temm. Man. d'Ornith.* p. 22.

Falco peregrinus. Peregrine Falcon. *Flem. Brit. Anim.* p. 49.

Peregrine Falcon. *Falco peregrinus.* *Selby, Illust.* vol. i. p. 39.

FALCO SUBBUTEO.

THE HOBBY.

WINGS longer than the tail. Of the male the upper parts greyish-black, the lower parts whitish, with longitudinal brownish-black markings, lower tail-coverts and tibial feathers red, a black band from the angle of the mouth. Of the female the upper parts dark brown, the lower reddish-white with broader dark brown markings, the lower tail-coverts and tibial feathers as in the male, but paler.

MALE.—The Hobby, which in colour seems a small edition of the Peregrine Falcon, is of a more slender form than that species, although compact in structure, and inferior to no falcon in spirit. The head is large, broad behind, flattened above; the neck short and strong; the body elongated ovate, rather deeper than broad anteriorly. The bill is short and very strong; the upper mandible with its dorsal line curved from the base, so as to form nearly the fourth of a circle, its sides convex, its edges sharp, with a slight central festoon, and a distinct angular process; the tip trigonal, sharp edged, its lower part perpendicular. The cere is short, its margins convex before the nostril, concave below and sloping rapidly towards the angle of the mouth. The lower mandible has the angle very broad and short, the dorsal line convex, the back broad and rounded, the sides convex, the edges inflected, the tip

directly truncate, with a semicircular notch on each side.

The upper mandible internally has a strong central ridge; the lower, which is deeply concave, a smaller elevated central line. On the palate are two prominent lines, having on their ridge numerous small papillæ directed backwards, and two smaller diverging lateral lines. The tongue is sagittate and papillate at the base, fleshy, oblong, channelled above, the tip rounded, with a notch, its lower surface horny, with a central groove.

The tarsi, which are anteriorly feathered about a third down, are slender, compressed behind, anteriorly and laterally with angular scales, five of which over the joint are scutelliform. The toes, which are connected at the base by short webs, are slender, scutellate above, the third toe much longer than the fourth, which is considerably longer than the second, the hind toe being stronger but shorter. The first toe has eight, the second twelve, the third nineteen, the fourth fourteen scutella.

The plumage of the upper parts is compact, but with the edges thin and loose, of the lower rather blended. The cere is nearly bare in its fore part; the radiating loreal feathers and those about the base of the bill bristle tipped, but with distant barbs. Feathers of the head short and rounded, of the back and breast oblong; of the sides elongated, as are those on the outer part of the tibia. Wings very long, narrowed towards the end and rather pointed; the first primary cut out on the inner web and but slightly shorter than the second, which is longest, and has the outer web slightly cut

out. The tail is rather long, slightly rounded, of twelve broad, rounded, acuminate feathers.

Bill bluish-black, the basal portion light blue; cere and eyelids yellow; (irides said to be reddish-brown;) feet yellow, claws black. The general colour of the upper parts is greyish-black, the shafts darker, the margins of a paler tint. The throat and sides of the neck are white; a black band from the angle of the mouth downwards. The hind part of the middle of the neck white. The quills black, with transverse yellowish-brown spots on the inner webs; the tail dark brownish-grey, the two middle feathers plain, the inner webs of the rest with transverse reddish-white marks. The breast and abdomen yellowish-white, with dark brown longitudinal streaks; the tibial feathers and lower tail-coverts bright orange-red.

Length 12 inches, extent of wings 26; wing from flexure 10 , tail $5\frac{3}{4}$; bill along the back $\frac{3}{4}$, along the edge of lower mandible $\frac{3}{4}$; tarsus $1\frac{5}{8}$, first toe $\frac{1}{2}$, its claw $\frac{5}{12}$; second $1\frac{9}{12}$, its claw $\frac{1}{2}$; third $1\frac{4}{12}$, its claw $\frac{5}{12}$; fourth $1\frac{1}{12}$, its claw $\frac{5}{12}$.

FEMALE.—The female has the bill and feet of the same colours as the male. The upper parts are deep greyish-brown, the shafts of a darker tint. The feathers of the head are margined with brown; the throat and sides of the neck are white; the mystachial band blackish-brown. The hind part of the middle of the neck is brownish-white. The quills are brownish-black, spotted on the inner webs with reddish-white; the tail greyish-brown, indistinctly marked with bands of a deeper colour. The breast and abdomen are reddish-

white, with longitudinal dark brown markings; the tibial feathers and lower tail-coverts light yellowish-red.

Length 13 inches, extent of wings 28; wing from flexure $10\frac{3}{4}$; tail 6; bill along the back $\frac{3}{4}$; tarsus $1\frac{1}{2}$, middle toe and claw $1\frac{7}{8}$.

HABITS.—The Hobby is not a permanent resident in Britain, but leaves us towards the end of autumn, and returns in April. Few individuals, it would appear, visit the country, for the purpose of rearing their young, and the species is probably confined to England, for I have not been able to obtain a specimen in Scotland. Its history, so far as can be learned from the notices of authors, is this. Its flight is extremely rapid and protracted. It preys on larks, various small birds, sandpipers, quails, and even partridges, as well as on insects; is remarkable for courage and activity; and when hawking was employed as a pastime, was trained for the chase.

PROPAGATION.—According to Montagu, it nestles in a tree, or takes possession of the deserted nest of a crow. The number of its eggs, he says, is usually four, of a bluish-white, with olive-green, or yellowish-brown blotches. Those which I have seen were broadly elliptical, bluish-white blotched with greenish-brown; one of them $1\frac{8}{12}$ by $1\frac{2}{12}$, the other $1\frac{5}{12}$ by $1\frac{2}{12}$.

YOUNG.—The young birds have the upper parts brownish-black, the tips and margins of all the feathers yellowish-white; the forehead yellowish-grey, and a line of the same over the eyes. The quills are marked

on their inner webs as in the old birds ; and the tail, which is greyish-brown, has the two middle feathers plain, but the rest marked with transverse bands of light red, disappearing at the inner third of the outer web ; the tips of the tail and quills reddish-white. The throat is yellowish-white, and there is a ring of the same round the neck, but indistinct behind. The breast and abdomen are yellowish-white, with longitudinal bands of deep brown ; and the thighs, which are pale yellowish-red, are similarly streaked, while the lower tail-coverts are yellowish-white with brown shafts.

REMARKS.—The only vernacular name known to me is the Hobby, or Common Hobby. Linnæus seems to have confounded it with the merlin.

Falco Subbuteo. *Linn. Syst. Nat.* vol. i. p. 127.

Falco Subbuteo. *Lath. Ind. Ornith.* vol. i. p. 47.

Hobby. *Mont. Ornith. Dict.*

Faucon Hobereau. Falco Subbuteo. *Temm. Man. d'Orn.* p. 25.

Falco Subbuteo. Hobby. *Flem. Brit. Anim.* p. 49.

Hobby. Falco Subbuteo. *Selby, Illustr.* vol. i. p. 43.

FALCO VESPERTINUS.

THE ORANGE-LEGGED FALCON.

THE wings, when closed, about the same length as the tail. Of the male the plumage uniform deep bluish-grey, excepting that of the abdomen and legs, and the lower tail-coverts, which are bright yellowish-red, the cere orange-red, the feet reddish flesh-coloured, the length about twelve inches. Of the female, the upper part of the head and the hind neck yellowish-red, the back greyish-blue, barred with black, tail bluish-grey with black bands, lower parts light yellowish-red with oblong brown spots. Of the young the head reddish-brown with black shaft-lines, the back deep brown, the feathers edged with light red, space about the eyes blackish, the lower parts yellowish-white, with longitudinal brown spots.

MALE.—The Orange-legged Falcon, which in form resembles the hobby, the red-throated falcon, and the merlin, is remarkable for the beauty of its colouring. The proportions of its parts are more or less similar to those of the species last described. The bill is very short and strong; the upper mandible has the dorsal line curved from the base, so as to form nearly the fourth of a circle, its sides convex, its edges sharp anteriorly, with a distinct central festoon, anterior to which is a narrow dentiform process, having between it and the acute descending tip a rather deep sinus.

The cere is short, its margin on each side forming a convex curve before the nostril, which is round, with a central papilla. The lower mandible has the angle very broad and short, the dorsal line convex, the back broad and rounded, the sides convex, the sharp edges inflected, the tip directly truncate, with a semicircular notch on each side behind it.

The tarsi, which are anteriorly feathered more than a third down, are slender, covered with angular scales, of which a few (about four) on the inner and fore part are scutelliform, while over the joint there are three distinct scutella. The toes are slender, the anterior connected at the base by short webs, of which the outer is longer; the first toe short, the second shorter than the fourth, the third much longer. On the first toe are five, on the second eight, on the third thirteen, on the fourth six scutella, besides scales at the base. The claws are small, compressed, curved in the fourth of a circle, that of the third toe with its inner edge much dilated.

The plumage of the head and neck is blended, the feathers having loose edges; that of the back rather compact, of the abdomen and tibiæ loose. The cere is bare on its upper and fore parts, as are the eyelids, which are furnished with ciliary bristles. The radiating loreal feathers, and those about the base of the bill, are bristle-tipped, but distantly barbed in the greater part of their extent. The feathers in general are ovate and rounded. The wings are long, rather broad, pointed; the primary quills strong, tapering, rounded, the second longest, the first longer than the third, the rest rapidly graduated. The first quill is abruptly cut out

on the inner web near the end ; the rest are merely tapering ; the secondary quills are thirteen, slightly curved inwards, broad and rounded. The tail is long, nearly even, of twelve rather broad rounded feathers.

The bill is pale yellow at the base, yellowish-brown towards the end ; the cere orange, as are the eyelids ; the irides " dark-brown," the feet " reddish-flesh-colour," the claws pale yellow with brown tips.

The general colour of the plumage is deep greyish-blue or leaden, the quills lighter, with brownish-black shafts, the tail blackish-blue. The abdomen, the lower tail-coverts, and the tibiae, are light yellowish-red.

Length to end of tail 12 inches, to end of wings $11\frac{3}{4}$; extent of wings estimated at 28, wing from flexure $10\frac{1}{4}$; tail $9\frac{1}{4}$; bill along the back $\frac{5}{8}$, along the edge of lower mandible $\frac{1}{2}$; tarsus $1\frac{3}{8}$; first toe $\frac{5}{8}$, its claw $\frac{5}{16}$; second $\frac{6}{16}$, its claw $\frac{5}{16}$; third $1\frac{1}{8}$, its claw $\frac{6}{16}$; fourth $\frac{8}{16}$, its claw $\frac{4}{16}$.

The above description is that of a specimen from the continent. Having been desirous of rendering my account of this species as perfect as possible, I requested Mr Yarrell to furnish me with some notice respecting it, which, with an urbanity that claims my gratitude, he promptly did ; so that I am enabled here to present a particular account of the gradations through which it passes.

" MALE.—The plumage of the males after their first moult is much more uniform than that of the females. The adult male has the head, back, wings, tail, neck, breast and belly, of a uniform dark lead colour ; the thighs, vent, and under tail-coverts, deep ferruginous ;

the cere and eyelids reddish-orange, the irides dark brown, the base of the beak yellowish-white, the rest dark horn-colour; the tarsi and toes reddish flesh-colour, the nails yellowish-white with dusky tips. Length of the bird eleven inches.

“ *Young males* appear first in plumage similar to that of the young females, changing at their first moult to a uniform bluish-grey; thighs and flanks ferruginous. Cere, beak, tarsi, toes and nails, as in the old male.

“ **FEMALE.**—The adult female has the head and back of the neck dark reddish-brown, the eye surrounded with dusky feathers almost black; the whole of the back, wing-coverts, and tail-feathers, blackish-grey, transversely barred with bluish-black; upper surface of the primaries uniform dusky black. The chin and throat nearly white, breast and all the under surface of the body pale rufous with dark reddish-brown longitudinal streaks; the thighs and their long feathers plain rufous; under wing-coverts rufous with transverse bars of dark brown; under surface of the wing primaries blackish-grey with numerous transverse bars of bluish-grey; under surface of the tail feathers bluish-grey, with nine or ten bars of bluish-black, the bars increasing a little in breadth as they approach the tip. Beak, irides and tarsi as in the male.

“ *Young females* have the top of the head reddish-brown, with dusky streaks; the eyes encircled with black, with a small black pointed moustache descending from the anterior part of the eye; ear-coverts white; upper surface of the body dark brown, the feathers ending with reddish-brown; wing primaries dusky black.

the inner edges and tips buffy white; the tail feathers dark brown, with numerous transverse bars of reddish-brown. Throat white; sides of the neck, the breast, and all the under surface of the body, pale reddish-white, with brown longitudinal streaks and patches on the breast; the thighs and their long feathers uniform pale ferruginous. Cere, beak, irides, tarsi, and nails, as in the adult.

“The three birds of this species first obtained in Norfolk were an adult female and two young males, in their second plumage; one of them, however, still retained the brown barred feathers on the outer portions of the wing-coverts, and four of the barred tail feathers of the preceding state. Four examples of this species have been obtained in the county of Norfolk, and two others, an adult male and female, have occurred in Yorkshire. A female lived two years in the garden of the Zoological Society in the Regent's Park.”

REMARKS.—The Orange-legged Falcon has not been observed in Scotland, and the above are the only instances in which it has been obtained in this island. According to M. Temminck, it inhabits woods and thickets, and is common in Russia, Poland, Austria, Tyrol, Switzerland, and the districts on the northern side of the Apennines. The same author states, that its food consists of beetles and other insects. Mr Gould, in his representation of this bird, has not attended to the form and arrangement of the scales of the tarsi and toes, nor added the ciliary bristles to the eyelids, of which the upper is in the figure of the female, overhung by a semicircular projection, such as I have not seen in any

other hawk, but which is wanting in the figure of the male. The adult male seems to have been first described and figured by Buffon, who considered it as a variety of the hobby, having "the throat, the lower part of the neck, the breast, a part of the belly and the large feathers of the wings, grey and without spots." He further mentions, that this bird and the hobby agree in having "the lower part of the belly and the thighs furnished with feathers of a bright red."

In the form of its claws, this species differs more from the peregrine and gyr falcons than the buzzard from the golden eagle. These organs are in it comparatively weak, less curved than in any other British falcon, and with the inner edge of the middle toe much more dilated. It is astonishing that these circumstances have not induced some sapient reformer to make a new genus of it, and thus lay claim to the honour of appending a "*mih*" to the altered name.

Falco vespertinus. *Linn. Syst. Nat.* vol. i. p. 129.

Falco vespertinus. *Lath. Ind. Ornith.* vol. i. p. 46.

Faucon à pieds rouges ou Kobez. *Falco rufipes.* *Temm. Man. d'Ornith.* p. 33.

Orange-legged Hobby. *Falco rufipes.* *Selby, Illustr.* vol. i. p. 45.

FALCO TINNUNCULUS.

THE KESTREL.

THE wings, when closed, about two inches shorter than the tail; the length from thirteen and a half to fifteen inches. Of the male, the head, hind-neck, rump and tail, ash-grey, the latter with a subterminal band of brownish-black; the back pale red, with dark guttiform spots; the breast and sides light yellowish-red, with longitudinal linear-lanceolate dark streaks. Of the female, the whole upper parts and tail light red, with transverse spots and bars of dark brown, the lower parts paler, the breast and sides with oblong dark markings. The young similar to the female, but with the spots larger. •

MALE.—The Kestrel, which is one of the most common, as well as most elegant, of our falcons, is of a structure that unites lightness with strength, and may be taken as an example of the most characteristic form of a rapacious bird destined to prey upon animals much smaller than itself. The body is ovate, rather deeper than broad anteriorly; the neck rather short and strong; the head broad and flattened above. The bill is short, strong, and comparatively broad; the upper mandible with its dorsal line curved from the base, so as to form nearly the third of a circle, its sides convex, its edges sharp anteriorly, the dentiform process and medial festoon very distinct, the tip at its extremity perpendicu-

lar to the gape-line. The cere is short, its margin forming a convex curve before the nostril, below which it is concave, and slopes towards the angle of the mouth. The lower mandible has the angle very broad and short, the dorsal line convex, the back broad and rounded, the sides convex, the sharp edges inflected, the tip almost directly truncate, with a semicircular notch on each side behind it.

The upper mandible within has a very prominent central ridge; the lower, which is deeply concave, a smaller elevated central line. On the palate are two prominent longitudinal lines, having on their ridge minute papillæ directed backwards, and two smaller diverging lateral lines. The palatal slit is narrow-oblong behind, linear before, laterally and posteriorly with four flat lobes fringed with acicular papillæ. The tongue is short, fleshy, posteriorly sagittate and papillate, rounded and emarginate at the end, channelled above, its lower free surface horny and with a central groove. The œsophagus, which is four inches and a-half in length, is a little dilated about the middle, where it lies rather to the right of the trachea, and has the walls of its lower part thickened and studded with cylindrical glandules. This part, the proventriculus, opens with a wide aperture into the stomach, which is of a roundish rather flattened form, when distended two inches in diameter; the muscular coat thin, with the two lateral tendons small but distinct, and about half an inch in diameter; the middle coat thin and tough, the inner soft and easily separated. The pylorus is very narrow, with three soft valvular prominences. The intestine, for about eight inches, is nearly of uniform diameter,

being four-twelfths across, after which it gradually contracts to a diameter of three-twelfths. At the distance of about two and a half inches from its dilated extremity are the cœca, which in their highest development are of a somewhat conical form, adherent to the intestine, three-twelfths of an inch in length. The length of the intestine is twenty-four inches. The liver is of two nearly equal undivided lobes; the gall-bladder less distinct than in the merlin.

The eyes are large; the eyelids furnished with short bristles on the margin, the upper bare, with the lachrymal bone prominent; the nostrils in the fore part of the cere, round; the aperture of the ear round and rather large.

The tarsi, which are anteriorly feathered more than a third down, are rather short, slender, covered all round with angular scales, of which the anterior are larger, but none scutelliform, excepting four over the joint. The toes are rather slender, of moderate length, scutellate above, the third and fourth connected at the base by a very short web; the first toe short, the second and fourth of the same length, the third considerably longer. On the first toe are eight, on the second nine, on the third sixteen, on the fourth eleven, scutella.

The plumage of the upper parts is rather compact, of the lower softer and blended. The feathers at the base of the cere, and between it and the eye, are bristle-tipped, but distantly barbed in the greater part of their extent. The feathers of the head are short, ovate, and pointed; those of the neck more elongated and rounded; of the back broadly oblong and rounded, as are

those of the breast; of the sides long; of the inner side of the leg downy, of the outer elongated and loose at the ends. The wings are long, rather broad, narrow towards the end; the primary quills of moderate strength, tapering, rounded; the second longest, the third scarcely shorter, the fourth a little longer than the first, which is nearly an inch shorter than the second, the rest rapidly graduated; the first and second abruptly cut out on the inner web near the end, the second and third slightly cut out on the outer web; the secondary quills thirteen, broad and rounded. The tail is long, rounded, of twelve straight rounded feathers, the latter an inch and a half shorter than the central.

The bill is pale bluish-grey, the tips black, and the base close to the cere tinged with yellow; the cere and bare orbital spaces pale orange. The palate is flesh-coloured, its sides pale blue. The irides are brown, the feet rich orange, the claws black, tinged with grey at the base.

The upper part of the head and the hind neck are ash-grey, each feather with a central dusky line; the cheeks of the same colour tinged with yellow. The back and smaller feathers of the wing, with the scapulars, and some of the inner secondary quills, are light red, each with the shaft blackish grey, and a guttiform spot of the same near the end. The primary quills and their coverts are brownish-black, tinged with grey, margined with paler, their inner web indented with numerous confluent white markings; the outer secondary quills similar, the inner pale red on their outer web, dusky on the inner, with reddish-white indentations.

The rump, upper tail-coverts, and tail, are ash-grey or light bluish-grey, the latter with the shafts and a subterminal bar upwards of an inch in breadth, blackish-brown, the tips greyish-white. The throat is yellowish-white, without spots. There is a blackish-grey mark near the angle of the mouth, and a line of the same along the inner and upper edge of the eye. The breast and sides are pale yellowish-red, each feather with a narrow central line and subterminal lanceolate spot of dark brown. The tibial and abdominal feathers are paler and unspotted; and the lower wing-coverts are white, with triangular spots of blackish-grey.

Length to end of tail $13\frac{1}{2}$ inches, to end of wings $11\frac{3}{4}$; extent of wings 27; wing from flexure $9\frac{3}{4}$; tail $6\frac{1}{4}$; bill along the back $\frac{8}{10}$, along the edge of lower mandible $\frac{8}{10}$; tarsus $1\frac{1}{2}$; first toe $\frac{6}{12}$, its claw $\frac{7}{12}$; second $\frac{9}{12}$, its claw $\frac{1}{2}$; third $\frac{1}{2}$, its claw $\frac{8}{12}$; fourth $\frac{9}{12}$, its claw $\frac{1}{2}$.

FEMALE.—The female, which is not much larger than the male, differs considerably in external appearance, and chiefly in having less grey, the fore-part of the head, the rump, and the upper tail-coverts, as well as the tail, having merely a slight shade of bluish-grey on their general reddish-colour. All the upper parts are thus light red, but of a paler tint than in the male, and barred with dark brown, each feather having four bands of brown and three of red, of which latter colour is the tip also, the shafts dark brown. The secondary quills are similarly marked, but the primary are brown, with transverse spots of pale red, confluent on the inner

edge, along the inner webs. The tail is pale red, tinged with grey, and has about ten narrow bars of blackish-brown, the extreme bar nearly an inch in breadth, and the tip reddish-white. The lower parts are pale yellowish-red, longitudinally streaked with dark brown on the fore-neck and breast, the streaks guttiform on the latter, and on the sides forming transverse bands. The outer tibial feathers have small elongated dark markings; the abdominal feathers and lower tail-coverts unspotted, as in the male; the lower wing-coverts white, with oblong brown spots. The bill and other bare parts as in the male.

Length to end of tail $14\frac{1}{2}$ inches, to end of wings $12\frac{1}{4}$; extent of wings 30; wing from flexure $9\frac{3}{4}$; tail $7\frac{1}{4}$; bill along the back $\frac{8}{10}$, along the edge of lower mandible $\frac{8}{10}$; tarsus $1\frac{7}{16}$; first toe $\frac{1}{2}$, its claw $\frac{7}{12}$; second $\frac{9}{12}$, its claw $\frac{1}{2}$; third $1\frac{1}{12}$, its claw $\frac{8}{12}$; fourth $\frac{9}{12}$, its claw $\frac{5}{11}$.

VARIATIONS.—The males vary a little in size and colour. Younger individuals have the grey on the head less pure, the secondary quills marked on the outer webs with spots, and on the inner with bars of red, and the inner webs of the tail-feathers with eight bars of deep brown. The females also differ in size and colour, assuming more grey on the head and tail the older they grow. The plumage, when fresh, is brighter and more deeply tinted, and becomes paler and bleached towards the period of renewal, but no very remarkable changes take place.

I have observed a difference in the coecal appendages of the intestine, which it is of some importance to note.

In the summer of 1835, while preparing this little work for the press, I examined the digestive organs of four kestrels, two males and two females. The œsophagus of the first male was four inches and a half in length, the intestine twenty-four. The length of those of the second was the same. In one of these birds I could find no cœca, but in the other I with much difficulty observed a single very small rudimentary appendage, little more than one-twelfth of an inch in length. Of the two females, the œsophagus was also four and a half inches long, the intestine of one twenty-two, of the other twenty-five inches. In one I failed to discover any cœcum; in the other I found a rudimentary one similar to that mentioned, and a slight knob not larger than the head of a small pin. Having received the body of another male in the end of July, I was astonished to find two very distinct cœca, which were adherent to the intestine, rather pointed, three-twelfths of an inch in length, and one-twelfth in diameter. Such a variation as this I have not observed in any other species of hawk.

HABITS.—The Kestrel, which is of more frequent occurrence in most parts of Britain than any other species of this family, excepting perhaps the sparrow-hawk, resembles the latter in its mode of flight, although it seems inferior to it in speed, or at least does not glide along in its ordinary flight with so much rapidity. But this may depend upon the difference of the kinds of prey selected by these two birds, the sparrow-hawk usually pursuing small birds, which are active and vigilant, and the kestrel generally seizing

mice and other small quadrupeds, as they are feeding among the grass, or young birds not yet fledged, or if so, not sufficiently strong or experienced to evade the pursuit of their enemy.

In searching for food, it flies at a moderate rate over the fields, at the height of forty or fifty feet, moving along with easy flappings, its tail slightly spread, and its neck retracted. For the purpose of examining a portion of ground with the care necessary for detecting its prey, it frequently fixes itself in the air, by means of rapid, very gentle, and at a distance scarcely perceptible flappings of its extended wings, and the expansion of its tail,—a habit not peculiar to this species, but perhaps more remarkable in it than in any other. On discovering its prey, it moves towards it, and darting suddenly upon it, seizes it in its talons, on which it flies directly off with great speed to a secure station in which it may devour it unmolested. You may frequently see it, after it has long hovered over a spot, descend with great velocity, but stop short before reaching the ground, and ascend in a wide curve, when it flies off to renew its hovering in some other spot. In such cases, its intended victim has probably saved its life by a speedy retreat to its hole.

The principal food of the Kestrel consists of field-mice, for among the contents of its stomach I have usually found hair, bones, and teeth of small glires. In one instance I found the stomach distended with fragments of the common dung-beetle, *Scarabæus stercorarius*. In the stomach of one of three individuals examined in May 1835, with the view of completing my description of the species, I found a mass of hair,

with jaws, teeth, and various bones of mice. In that of the second, the substances were similar, and among them were the jaws of the short tailed-field mouse. In the third was also a mass of hair, and bones of glires, but with the addition of two feet quite entire of a very young lapwing. The stomach of a female examined on the 29th June contained a mass of remains of young birds, of which the wings were more entire than the rest, and covered with shooting feathers. There was the entire head of a young bird, apparently a lark, the upper mandible of a young thrush, and the gizzard of a small bird filled with fragments of coleoptera. In the middle of July, I found in the stomach of a male fragments of birds partially digested. They had all been torn to pieces, and many of the bones broken. There were two birds, both young, their gizzards filled with insects and seeds. They were slender billed, and of different species. It was in this individual that I found the two very distinct cœca already mentioned. Whether the kestrel ever seizes full grown small birds, as it flies along the hedges or over the fields, I have not been able to ascertain by my own observation, although I have been credibly informed that it does. My friend Mrs Colonel Macneil informs me, that in Harris this species often carries off young chickens, as well as small birds; and there it certainly cannot prey on field-mice, which, if they occur at all, are extremely rare.

The cry of the kestrel is loud, shrill and clear, several times repeated; but it seldom utters it except in the neighbourhood of the station which it has selected for its retreat, and at the commencement of the breeding season. So far as I have observed, it retires

to the inaccessible parts of rocks, or to old buildings, to roost. I have seen it in almost every part of Scotland and England that I have visited; but it is of more frequent occurrence in wooded or cultivated districts than in wild barren regions, which, on the other hand, are preferred by the larger hawks and eagles.

Buffon's account of the habits of the Kestrel is somewhat different, but as he seems to speak from observation, and as his description is lively, I have pleasure in translating it. "The Cresserelle," says he, "is the most common rapacious bird in most of our French provinces, and especially in Burgundy. There is not an old castle or a deserted tower which it does not frequent and inhabit. It is particularly in the morning and evening that it is seen flying about these old buildings, and that it is heard more frequently than seen. It has a hurried cry of *pli, pli, pli*, or *pri, pri, pri*, which it incessantly repeats as it flies, and which frightens all the little birds on which it darts like an arrow, and which it seizes with its talons. If it should happen to miss them at the first plunge, it pursues them into the houses fearless of danger. I have more than once seen my people take a Cresserelle and the little bird which it was pursuing, by closing the window of a room, or the door of a gallery, which were more than two hundred yards distant from the old towers from which it had issued. When it has seized and carried off the bird, it kills it and plucks it very neatly before eating it. It does not take so much trouble with mice, for it swallows the smaller whole and tears the others to pieces. All the soft parts of the body of the mouse are digested in the stomach of this bird; but the skin

is rolled up so as to form a little pellet, which it voids by the mouth, and not by the intestine; for its excrements are almost liquid and whitish. On putting these pellets which it vomits into hot water, to soften and unravel them, you find the entire skin of the mouse, as if it had been flayed.—It at first feeds the young with insects, and afterwards carries to them plenty of field-mice, which it perceives on the ground from the greatest height in the air, when it slowly wheels, and often remains stationary to spy its prey, on which it falls in a moment. It sometimes carries off a red partridge much heavier than itself; it also often catches pigeons which straggle from the flocks; but its most common prey, next to field-mice and reptiles, consists of sparrows, chaffinches, and other small birds."

Whether this be correct or not, I am not qualified to decide; but, I believe, the Count has committed an error in the matter of the pellets. I have always found, both in the kestrel and in owls, the pellets composed of hair, with the bones carefully, as it were, wrapped up in their centre; but the skins were not left entire, as alleged in the above account; they had been, in fact, totally digested.

PROPAGATION.—The Kestrel seems to keep in pairs all the year round, and about the end of March begins to construct or repair its nest, which is composed of decayed twigs, sometimes intermingled with grass or wool, and is placed on the shelf or in the crevice of a rock, or in a convenient part of some old tower. Sometimes it builds in the steeples of churches, even in the midst of cities, at least this is said to be the case in

London; and sometimes it nestles in trees, or takes possession of the deserted nest of a crow or a magpie, as is also the case with the sparrow-hawk. But its favourite nesting place is some inaccessible shelf of a rock, whether in the interior, or on the sea-shore, among the ridges of the Grampians, or on the bold headlands of our eastern coast.

You may imagine yourself with me, on the grassy summit of the rock of Dunottar Castle, where we have arrived by a very steep and dangerous path. But really I am concerned for your safety, as well as my own, and therefore I shall transcribe, from one of my old journals, a narrative of my visit to this celebrated place.

“Dunottar Castle, Tuesday 20th April 1819, about 5 P. M.—Here I am, sitting on the stair of the great tower. But I am not so much recovered from the trepidation which seized me while climbing up the rock, to be able to guide my pen with ease. It is much more difficult to go down a rock than to go up it. However, I must try, for I cannot think of remaining here all night. I have tried the gate, but the lock is so strong and secure, that I can neither open nor break it.—Bervie, 8 o'clock.—I had been told at Stonehaven, that, in order to see the ruins, it would be necessary for me to apply to Dr Young for permission; but that, perhaps, it might not be convenient for him to send a person with me to open the gate. On approaching the rock I found it composed of conglomerate. The gate was shut, but I perceived a sort of path, probably formed by the sheep which I saw feeding around, and slanting across the face of the rock. So I put off my shoes

and stockings, and tried to get up, but was obliged to return. However, I was determined to get in, and observing on the southern side a place where I thought it possible to ascend, I commenced the arduous task. When about half-way up, I was obliged to leave my portables there, and throw my shoes and stockings down the rock. When about six or eight yards from the summit, I began to be seriously apprehensive, when I saw how steep the part above me was, and looked down upon the perpendicular cliff below; but, by scraping little holes in the turf for my fingers and toes, I made a safe ascent, and in a few minutes found myself within the limits of the castle. After thanking Heaven very fervently for my escape, I went through most of the buildings. All was ruin and desolation. The jackdaws and wild pigeons were nestling in the chimneys. Gulls of several kinds, and jackdaws, were in the rocks; and there also I observed two kestrels. The plants seen on the top in flower were the *Ranunculus Ficaria* and *Draba verna*; while on the face of the rocks was abundance of *Cheiranthus fruticosus*, *Cochlearia officinalis*, and *Statice Armeria*, the latter not yet expanded. After I had finished my observations, I thought how difficult it would be to get down again. I tried the slanting path near the gate, but it would not do; then endeavoured to move the bolt, but could not; and, lastly, to break the lock itself, but it was too strong. Then I took several views of the part by which I had ascended, but was almost terrified to look upon it. However, at length becoming apprehensive that I should be obliged to remain on the rock all night, I resolved to go deliberately to work; and so, strange

to say, slid down to the brink of the precipice without the least trepidation; and getting my heels and fingers fixed as before, descended without experiencing much, I may say any, difficulty. Glad was I, however, to find myself once more at the base of the rock; and gathering up my knapsack, I washed my hands and feet, put on my shoes and stockings, picked up some curious porphyritic pebbles from the beach, and regaining the highway, marched on to Bervie, glad enough that I had seen the castle, the rocks, the jackdaws, and the kestrels, without troubling any one."

The eggs of the kestrel are generally four, sometimes five, of a roundish or very short elliptical form, nearly equally rounded at both ends, pale reddish-orange, irregularly dotted all over with deeper red, and often having a few large blotches of reddish-brown. The length of each of two specimens $1\frac{5}{8}$ inch, the larger transverse diameter of one of them $1\frac{5}{8}$, of another $1\frac{2}{8}$. In form they vary from elliptical to regular ovate. I have observed that after incubation the abdomen and breast of the female sometimes become entirely bare to a great extent. The young are at first covered with white down.

YOUNG.—When the young are able to fly they present the following appearance. The bill is light bluish-grey, its tips yellowish-grey or horn-colour; the irides dusky, the cere pale greenish-blue, the feet yellow, the claws brownish-black, with paler tips. The head and hind neck are light brownish-red, longitudinally streaked with blackish-brown; the back, wing-coverts, rump, and tail, light red, but of a deeper tint than in the old

birds, the feathers transversely marked with broad dark brown bands, of which the extreme one is somewhat triangular. The primary quills and their coverts are dark brown, most of the former tipped with light red, all spotted with the same on their inner web, and the latter spotted more or less on both webs. On the tail are eight bars of dark brown, the last three-fourths of an inch broad, the tip dull reddish-white. The lower parts are pale yellowish-red, the sides of the neck and the breast marked with longitudinal streaks of dark-brown, as are the sides, but the dark markings on the latter have transverse processes. The tibial, abdominal, and lower tail-feathers are light reddish-yellow, some of the former with a central dusky line.

PROGRESS TOWARD MATURITY.—The male at the first moult shews the bluish-grey of the head, rump and tail; but the head is still tinged with red, and the tail is barred on both webs. As it advances in age, the tints become purer, the dark markings smaller and more attenuated; those on the outer webs of the tail disappear first, while on the inner webs they remain for two years. The changes which the female undergoes are less remarkable, but of a similar nature, although the parts which are ultimately greyish-blue in the male are merely tinged with that colour in the female, and the tail always remains barred.

REMARKS.—Of all our falcons, excepting the merlin, this species seems to me to present less difference between the sexes as to size; and I have seen a pair with three young ones, all of the same family, of which

the male was actually larger than the female. While writing this account, I have before me, along with five others, a fresh male, fourteen inches and a half long, and twenty-eight inches in alar extent; and the greatest length of any female that I have seen did not exceed fifteen inches. In this respect, the kestrel is best contrasted with the peregrine falcon and the sparrow hawk, between the males and the females of which there is an extraordinary difference. The American Sparrow Hawk, *Falco Sparverius*, is very nearly allied to the Kestrel, as is the *Falco tinnunculoides* of the south of Europe. Whatever may be the habits of the latter, those of the former, according to Mr Audubon, are similar to the habits of our species, in so far as regards the hovering, so much talked of as a singular phenomenon. This mode of assuming a fixed station in the air for observation, is, however, observed in the hen-harrier, the sparrow hawk, and the buzzard. Even the osprey, one of the largest of our birds of prey employs it, so that all theories formed on this circumstance, and tending to separate the Kestrel from other falcons, ought to be remitted to their authors for revision.

In the series of British falcons, the Kestrel and the Merlin are the species most nearly allied. The young of the latter bear a considerable resemblance in colour, as well as in form, to the young and the female of the former. In fact Buffon has figured a female kestrel as a merlin, although he talks as if he were very familiar with both species. It has been remarked that this bird is more crepuscular than our other hawks; but I have not observed this to be the case, and indeed an intelli-

gent friend of mine is of opinion that the sparrow hawk flies later than any other species, although I cannot affirm that it does. You may sometimes see a hawk of any species flying late in the evening, but in the dusk I have never seen one actually hunting.

The Kestrel is easily tamed, and, according to Willughby and others, was formerly employed by idle people for seizing small birds and young partridges. It is sometimes named the Kastril, Kestril, or Kistril, the Windhover, the Stannel, Stonegall or Steingall, and Sparrow Hawk. By the Highlanders it is united with the bird that properly bears the latter name, under the common appellation of Clamhan, to which is sometimes added the distinctive epithet ruadh, or red.

Falco Tinnunculus. *Linn. Syst. Nat.* vol. i. p. 127.

Falco Tinnunculus. *Lath. Ind. Ornith.* vol. i. p. 41.

Kestrel. *Mont. Ornith. Dict.*

Faucon Cresserelle. Falco Tinnunculus. *Temm. Man. d'Ornith.* p. 29.

Falco Tinnunculus. Kestrel. *Flem. Brit. Anim.* p. 50.

Kestrel. Falco Tinnunculus. *Selby, Illustr.* vol. i. p. 47.

FALCO ÆSALON.

THE MERLIN.

THE wings, when closed, reaching to within two inches of the tip of the tail, which has five conspicuous dark bands, the last much larger; the length from twelve to fourteen inches. Of the male, the upper parts deep greyish-blue, each feather with a black central line, the lower parts light reddish-yellow, with oblong dark brown spots. Of the female, the upper parts dark bluish-grey, tinged with brown, and lined with black, the lower yellowish-white, with large brown spots. Of the young, the upper parts brown, spotted with pale red; a narrow stripe of brown spots from the angle of the mouth; the lower parts yellowish-white, with large longitudinal brown markings.

MALE.—The Merlin, which is one of the most beautiful and lively birds of its genus, has a form indicative of strength and agility. The body is elongated ovate, rather deeper than broad anteriorly; the neck very short and strong; the head large, broad, and flattened above. The bill is short and very strong; the upper mandible with its dorsal line curved from the base, so as to form nearly the fourth of a circle, its sides convex, its edges sharp anteriorly, with a slight central festoon, anterior to which is the angular process characteristic of the genus, and which in this species is very distinct, and with its sides forming nearly a right

angle; the tip sharp-edged, and rather flattened, its lower part perpendicular. The cere is short, its margin forming a convex curve before the nostrils, below which it is concave, and slopes towards the angle of the mouth. The lower mandible has the angle very broad and short, the dorsal line convex, the back broad and rounded, the sides convex, the sharp edges inflected, the tip directly truncate, with a semicircular notch on each side behind it.

The upper mandible within has a strong central ridge; the lower, which is deeply concave, a smaller elevated central line. On the palate are two prominent lines, having on their ridge numerous minute papillæ, and two smaller diverging lateral lines destitute of papillæ. The palatal slit is narrow-oblong behind, linear before, laterally with two curved papillate lines on each side, the anterior of which is continuous with the palatal ridge. The tongue, which is sagittate and papillate at the base, is fleshy, oblong, channelled above, the tip rounded and emarginate, its lower surface horny, with a central groove. The œsophagus, which is four inches and a quarter in length, is dilated at the distance of an inch from its upper end into a kind of crop, rather more than an inch in length, and lying on the right side of the trachea. It then contracts to its original size, but at its lower part is again enlarged into a proventriculus, of which the walls are very thick, studded with cylindrical glandules, and presenting internally the appearance of a pulpy mass, divided longitudinally by six shallow grooves. This part is three-fourths of an inch in length. The mucous coat of the membranous part of the œsophagus is disposed in lon-

gitudinal rugæ, which are larger and more numerous in the crop. The stomach is of an ovate form, a little compressed; its muscular coat thin, but with distinct, although very thin tendons, about five-twelfths of an inch in diameter. The pylorus is very narrow, with three soft valvular prominences. The intestine, which is thirty-one inches long, has at its commencement, and for about six inches, a diameter of three-twelfths of an inch, but gradually diminishes to that of a line and a half. About two inches from its extremity are two cœca, so extremely small as to be with great difficulty found, adherent, and merely forming a shallow sac, not more than half a line in depth. The rectum dilates, and towards its extremity becomes somewhat funnel-shaped, with a diameter of about an inch. The liver is of two nearly equal undivided lobes; the gall-bladder large.

The eyes are large; the eyelids furnished with short bristles on the margin; the upper bare, with the lachrymal bone prominent; the nostrils in the fore part of the cere nearly round, with a central papilla; the aperture of the ear round and rather large.

The tarsi, which are anteriorly feathered more than a third down, are slender, anteriorly rounded, compressed behind, covered with reticular scales, ten of which on the inner and fore part are larger, while over the joint are four distinct scutella. The toes are slender, scutellate above, the anterior connected at the base by short webs, of which the outer is much longer; the first toe short, the fourth a little longer than the second, the third much longer. On the first toe are eight, on the second ten, on the third twenty-one, and on the fourth eleven scutella.

The plumage of the upper parts is compact, of the lower also strong, but blended. The cere is nearly bare on its upper and fore part. The radiating loral feathers, and those about the base of the bill, are bristle-tipped, but distantly barbed in the greater part of their extent. The feathers of the head are short, ovato-lanceolate, with a long tapering point; those of the neck oblong and rounded, as are those of the back and breast; of the sides long, of the inner side of the leg and tarsus soft and silky, of the outer elongated and loose at the ends. The wings are long, rather broad, narrowed towards the end; the primary quills strong, tapering, rounded, the third longest, the second very little shorter, the first a little shorter than the fourth, the fifth an inch shorter, the rest slowly graduated; the first and second abruptly cut out on the inner web near the end, the second and third slightly cut out on the outer web; the secondary quills thirteen, curved inwards, broad and rounded. The tail is long, nearly even, the lateral feathers a little shorter; of twelve rather broad, rounded feathers, which, as well as the secondary quills, have a minute acumen.

The bill is pale blue at the base, bluish-black at the end; the cere dull wax-yellow, the bare parts of the eyelids greenish yellow. The palate is of a dark leaden blue, the inside of the mandibles pale blue; the tongue flesh-coloured, its horny part blue. The irides are dark brown; the feet orange-yellow, the claws black.

The upper part of the head is dark brownish-grey, each feather with a central line of black. The anterior part of the forehead, the loral space, and the cheeks, are greyish-white, the latter with blackish lines. Over

the eye is a greyish-white band, margined beneath with black. On the hind neck is a broad half collar of pale red, of which each feather has a central brownish-black line, or lanceolate mark, near the tip. The upper parts in general are of a deep greyish-blue, the rump and tail of a lighter and purer tint, each feather with a central line of black. The edge of the wing is tinged with red; the alula and primary coverts dark greyish-brown, the outer feather of the former marked on the edge with white spots, of the latter broadly barred with white; all with large greyish-white marks on the inner webs. Primary quills blackish-brown, tinged with grey; outer margin of the first spotted with white; secondary quills mostly of the same colour as the back; the inner webs of both sets of quills beautifully marked with transverse elliptical spots of white. The tail is light bluish-grey, with five apparent bars of brownish-black, the last bar an inch in breadth; the tips white, with a central black line. The real number of dark bars is six on the middle, and eight on the lateral feathers. The throat is white; the rest of the lower parts white tinged with yellowish-red, which tint prevails on the sides of the neck and breast, each feather with the shaft and spot towards the end dark brown, the markings on the fore-neck being linear, on the breast lanceolate, on the sides broader, but all longitudinal. The abdomen is without markings, but each of the lower tail-coverts has a central streak. The tibial feathers are light yellowish-red, the short inner ones pure, the outer with narrow lanceolate brown central markings. The lower wing-coverts are variegated with reddish-brown and greyish-white, the latter colour being on the

larger disposed in opposite roundish spots; the lower surface of the quills and tail-feathers very beautifully barred with greyish-white and dark grey.

Length to end of tail 12 inches, to end of wings $10\frac{1}{2}$; extent of wings 26; wing from flexure $8\frac{1}{2}$; tail 5; bill along the back $\frac{3}{4}$, along the edge of lower mandible $\frac{3}{4}$; tarsus $1\frac{5}{12}$; first toe $\frac{5}{12}$, its claw $\frac{6}{12}$; second $\frac{8}{12}$, its claw $\frac{6}{12}$; third $1\frac{9}{12}$, its claw $\frac{6}{12}$; fourth $\frac{1}{2}$, its claw $\frac{6}{12}$.

FEMALE.—The female, which is considerably larger, differs also in the colours of its plumage. The bill is light blue, tipped with black, as in the male; the cere wax-yellow; the eyelids greenish-yellow; the tarsi and toes pure-yellow; the claws black. The general colour of the upper parts is deep brown, slightly tinged with blue, each feather having a central line of black. Part of the hind neck is yellowish-white, the feathers there tipped with brown. The quills, larger coverts, and alula, have a regular series of rounded light red spots on both webs, and their tips are of the same colour, but paler. On the tail are five conspicuous bars of pale reddish-brown spots, and a terminal band of greyish-white; the lateral feathers having two more of these light bars at the base. A yellowish line, margined beneath with blackish-brown, extends over the eye. The throat and cheeks are yellowish-white, the longer feathers of the latter tipped with brown; and from the angle of the mouth is a band of brown, formed by the central markings of the feathers. The lower parts in general are pale reddish-yellow, marked with numerous oblong spots of brown, larger than those of the male; the abdominal feathers and lower tail-coverts nearly

spotless, a single row of the latter on each side having a line of brown on each feather. The lower wing-coverts are brownish-red, spotted with yellowish-white; the long feathers of the leg marked with brown lines, the shorter nearly white, and without markings.

Length to end of tail $12\frac{1}{2}$ inches, to end of wings 11; extent of wings 28; wing from flexure 9; tail $5\frac{1}{2}$; bill along the back $\frac{10}{12}$, along the edge of lower mandible $\frac{10}{12}$; tarsus $1\frac{6}{12}$; first toe $\frac{6}{12}$, its claw $\frac{8}{12}$; second $\frac{9}{12}$, its claw $\frac{7}{12}$; third $1\frac{4}{12}$, its claw $\frac{8}{12}$; fourth $\frac{11}{12}$, its claw $\frac{7}{12}$.

VARIATIONS.—The males vary in colour, the blue of the back being of various tints, in younger individuals tinged with brown, in older purer, and much lighter on the rump. In some birds also, the dark bands on the tail disappear, excepting the last or broader, while in others they disappear from the two middle feathers, but remain more or less apparent on the rest. The lower parts vary from light yellowish-red to deep orange-brown. The females vary less remarkably than the males, to the colouring of which, however, they ultimately approximate, in the upper parts at least. The males vary in length from eleven and a half to twelve and a half inches, the females from twelve to thirteen, or a little more.

HABITS.—In some parts of Scotland the Merlin is not very uncommon, and Mr Selby states that he has frequently met with it in the north of England. In the Lothians, it is, next to the kestrel and the sparrow-hawk, perhaps the species that is most frequently seen. In the northern parts of the island it is a constant re-

sident, but in the south of England, where it is rarely seen, it has been supposed to be merely a winter visitant.

In courage and activity, this species is excelled by none of our rapacious birds. Its flight is very similar to that of the sparrow hawk, being rapid, protracted, and devious. But it generally flies at a greater height than that bird, although you may also see it skimming over the fields or copses, and gliding along the hedges. It often captures small birds by thus coming upon them unawares; but it may as often be observed pursuing one in the open sky, and ultimately securing it, sometimes after a long chase. It perches on a stone or crag, apparently for the purpose of inspecting the neighbourhood, and from its station, should a flock of small birds come up, it fixes upon an individual, from the pursuit of which it is not drawn by the presence of others. Its prey consists of larks, chaffinches, thrushes, sandpipers, plovers, and even partridges. Some authors state that it also occasionally feeds on beetles and other insects; which is a habit common to all the smaller hawks, as well as most owls.

In September 1832, I had an opportunity of observing a Merlin in pursuit of a sanderling. It came up as I was shooting along the shore at Musselburgh, searched about for some time, flying in various directions at a height of an hundred yards or so, until at length spying the bird, of which it had probably been in chase before I observed it, it rushed after it. The sanderling doubled and endeavoured to escape by skulking among the stones, but the Merlin kept constantly over it, without, however, attempting to seize it when on the ground.

The chase continued for some time, when I observed that the merlin had perched on a stone; when, thinking that it had secured its prey, I endeavoured to get within shot of it. On my going up to it, however, it rose, and soon after the sanderling made its appearance, apparently undecided as to the course it ought to take, on which the Merlin swept towards it in a deep curve and seized it. But now the hawk became in its turn the pursued party, and on its alighting to feast near one of the bathing machines, I ran up and shot it from behind the cover.

More than twenty years ago, when I was residing in the island of Harris, the herd-boy brought in a Merlin alive, which he had caught in the act of pouncing a starling in the midst of the cattle. The merlin had struck the starling, and both had come to the ground together, on which the lad ran up and secured them. Besides being remarkably small, this bird was extremely emaciated, otherwise no doubt it could have carried off a much heavier quarry than a starling.

The contents of the stomach of two individuals whose intestinal canal I examined, were exclusively remains of birds; and although the Merlin is said to eat insects, it does not appear that it preys upon mice or reptiles, like many other hawks. Around the place where a pair had bred on the Pentland Hills above Penicuik, in the summer of 1835, there was a great quantity of snipes' feathers, and, among other matters, the remains of a sand-martin. The young were able to fly by the middle of July.

The Merlin was formerly trained to catch larks, snipes, woodcocks, and young partridges; and appears

to have been a favourite with the gentle ladies of the "good old times," when robbery and murder were the principal occupations, and hunting and hawking the favourite pastimes.

" The Ladye by the altar stood,
Of sable velvet her array,
And on her head a crimson hood,
With pearls embroidered and entwined,
Guarded with gold, with ermine lined;
A merlin sat upon her wrist,
Held by a leash of silken twist."

Lay of the Last Minstrel, canto vi.

The following note is appended to this passage by the author:—" A merlin, or sparrow hawk, was actually carried by ladies of rank, as a falcon was, in time of peace, the constant attendant of a knight or baron. Godscroft relates, that when Mary of Lorraine was regent, she pressed the Earl of Angus to admit a royal garrison into his castle of Tantallon. To this he returned no direct answer; but, as if apostrophizing a goss-hawk, which sat on his wrist, and which he was feeding during the queen's speech, he exclaimed, 'The devil's in this greedy glede, she will never be full.' Barclay complains of the common and indecent practice of bringing hawks and hounds into churches."

PROPAGATION.—On the side of the Lammer-Law, the highest hill of the low range that extends from the county of Peebles towards St Abb's Head, near the brink of a scar, which has been worn deep in the gravelly soil by the undermining action of a rill, is a nest

of the Merlin, if nest that can be called, which is merely a little flat space strewn with a few sticks and withered sedges. You hear the hungry plaint of the young, as the morning dawn rouses them from their slumbers. See! the mother advances a few steps, stretches her wings, shakes herself, inspects her plumage, trims a bent feather in her tail, picks a little clot of peat from her toe, eyes the heavens slantingly, and throwing herself forward, spreads out her beautiful pinions, and launching into the air, ascends a few yards by strong flappings. How lightly she wheels in her circling flight, as she seems now to glance toward her young a look of parental affection, and again surveys the distant plains! Now, her few short wheelings ended, off she shoots, flying in a direct line towards the Gifford woods, where, no doubt, she expects to find a missel thrush by the edge of the orchard, a young partridge beneath the hedge, a lark carolling over the field, or, at all events, some object worthy of her pursuit. As you watch her motions, the male, having shaken off his drowsiness, trimmed his plumes, and scratched his cheek—he could do no more, for he has none of those combs on his claws with which the philosophers tell us some birds are furnished for the purpose of combing their whiskers—springs into the air, and almost touching the tops of the broom and heather, the inhabitants of which might conceive him to be a harpy, speeds directly over the shoulder of the hill, to search the upland moors. They are gone; and what remains? Look around you.

In the crimsoned east stretches out the smooth expanse of the German ocean, bounded to the northward by the coast of Fife, toward the south by the shores of

East Lothian. Straight before me, like a giant leaning on his elbow, or a volcano that in a single night has emerged from the deep, rises the rocky protuberance of the Bass, the haunt of thousands of gannets, which at this distance, however, I can perceive only with the aid of fancy. Beyond this, to the left, is the dun isle of the May, with its glimmering light, surmounting a range of whitened cliffs, and indicating to the mariner in the darkness of night, and amid the howl of the tempest, the path that will lead him to his desired haven. Along the eastern horizon stretches a dim ridge of undulated ground, the culminating points of which, as the French geologists say, are the broad eminence of Largo Law, the two Lomonds, and lastly, the Ochil Hills, far in the north-west, and shrouded in the undispersed haze of night. Nearer, but yet distant, is the beautiful mountain called Arthur's Seat, behind which is the metropolis of Auld Scotland. There, though you cannot see her, sits Edina, like a queen, on her throne of hills. As yet none are astir on the quiet streets of the fair city save the drowsy watchman, who, methinks, (or more correctly, I think), I hear at this moment proclaiming to the tall houses of the High Street, or the arches of George the Fourth's Bridge, that it is half-past three.

But look this way: a Merlin has already arrived, bearing in his claws an unfortunate snipe, which he clutched as it was searching for a few worms, to satisfy the hunger of its patient and uncomplaining young, that lay squat among the moss in the low grounds beside the Milton Burn. What a clamour the ravenous creatures make, as their mother throws down the prey,

which one of them presently seizes, and appropriates to himself. Now she is off. But what is that on the hill top? A hawk, "I guess," with a burden as large as itself. It comes, and that not slowly. It has arrived. A golden plover, with its beautiful black breast, margined with white, stood on the top of a mossy mound, that overlooked a bog covered with the "snowy canna of the hill" of my great grandfather old Ossian, the *Eriophorum angustifolium* of my brethren in arms, the modern botanists, those "sons of little men," or men of great souls, as you please; when suddenly there came upon him the ruthless plunderer. Loud screamed the bird of the moors, as he sprung on wing, and sped his rapid flight. It was a beautiful sight to be seen. Like a pirate chasing a merchantman among the shoals of Cuba, did the Merlin thread the mazes of the plover's path, until at length, coming down upon him at an unlucky turn, he drove him to the ground stunned and gasping, his right pulmonary vein ruptured, (as you might have guessed had you seen the bright blood that issued from his mouth, for had it been the artery, as you well know, the blood would have been dark). There the ruthless marauder squeezed and pushed him with his talons, like a burker of true breed, and scalped him, as a red man of "the Ohio woods" used to scalp the pioneers fifty years ago, and screamed over him, like a smoked Cossack over a murdered Frenchman "in the hundred days."

Let him divide the prey; for see, how gorgeous the crimsoned canopy that hangs over the eastern waters! The plains of Lothian stretch toward the sea, covered with woods and corn, farm-houses and villages. There

rises the beautiful cone of Berwick Law, here the rounded eminence of Traprain; beyond Haddington the undulated ridge of the Garlton Hills. All these, with the isles and mountains before observed, you perceive are igneous or trap rocks while the plains through which they protrude belong to the "coal formation," or to some formation the precise station of which seems to puzzle those ingenious people, the geologists, who are perpetually building worlds and pulling them to pieces. The blaze of the eastern sky becomes more intense. Anon a flood of light streams from the edge of the ocean, and now emerging from the deep, slowly and steadily mounts the great orb of day, until at length it clears the horizon, and rolls upwards into the heavens, a glory, on the full splendour of which your eyes are no more fitted to gaze than your intellect is to contemplate the perfections of its Maker. Now, just recollect all the beauties of the ancient mythology; fancy to yourself Apollo rising from the lap of Thetis, or "Dan Sol," with his golden-wheeled chariot and fiery steeds, and think for a moment what a contemptible figure they make compared with that sun which now advances "rejoicing like a strong man to run a race," that ocean which blazes with light, and that sky suffused with all glorious tints, from the intense brightness of its eastern region to the crimson of the light clouds that hover over the frith, and the purple blue of the western hills. Joy spreads over nature. The lark carols in the sky, the mavis pours forth his mellow song from the hill, the plover whistles shrill on the moor, the plaint of the lapwing comes from the bog beneath, and hear!—was it thunder?—no—hear!—from far overhead comes the

drumming sound of the snipe, which you may see wheeling and diving in the upper regions of the air. The "lang yellow broom" on "the ferny brae," the white-flowered *parnassia* on the mossy swamp, the golden *hieracium* on that greywacke crag, and the long clusters of the purple foxglove scattered along the sides of the "scar," all seem to burst in beauty on your sight. It is a lovely world after all. Let them talk of their myrtle groves of "the sweet south," their pine forests of "the stormy north," their tangled jungles of "the gorgeous east," their primeval woods of "the far west," their palmy isles, their green savannahs, their steaming swamps, or their burning deserts;—place me among the purple heather, on one of the Lammermoor hills, with a merlin's nest in view, and I leave them to enjoy their own pleasures. If they please they may ride crocodiles and thrapple rattlesnakes for aught I care.

Again, one of the falcons has arrived, with a lark in his claws. Come, let us go, for we have much to do before we reach Gifford, where we are to breakfast. Nay, not so fast, "wait a wee;" we are on the Lammer Law, beside a hawk's nest, and I wish to shoot that smart little fellow that you see hastening away to Danskin Loch. In five minutes he will be there, for eight miles to a merlin are nothing. There, I think, I see him as he goes dashing over the woods. The still pool, overgrown in part with rushes and reeds, and shadowed by thick firs, brightens under the morning beams that shoot slantingly over the hollow in which it lies. The water-hen moves merrily along, jerking up its white-patched tail, as it leads its sooty brood to

the sedgy thicket; the mallards are muddling and spluttering by the edge of the swamp; and a single heron stands on a little rocky isle, on a single leg, with indrawn neck and yellow bill directed forwards. Is there nothing else? Yes, the merlin skims over the pool; a sandpiper flies off and is pursued; the gallinules scramble among the reeds, the ducks splash in the water, and the heron lets down his leg, and places himself in an attitude of observation. But the chase is over; the merlin flies off with his prey. Had I the "telescopic eye" of a kite I might see him advancing over the Cairn Hill. Here he comes; we can now see him without glasses. You may imagine, good reader, that you hear a shot, that the merlin comes to the ground, that thereupon the curtain falls, the "whaups" on the hill scream, and the company disperses.

According to M. Temminck, the merlin nestles on trees, or in the fissures of rocks, and lays five or six eggs, of a whitish colour, marbled at one end with greenish-brown. With us, however, its nest is placed on the ground, among the heath, and, according to Mr Selby, contains from three to five eggs. They are very similar to those of the sparrow hawk, being bluish-white, blotched and spotted with deep reddish-brown; an inch and seven-twelfths in length, with their largest transverse diameter an inch and two-twelfths; their form broadly elliptical.

YOUNG FLEDGED.—The young birds when fully fledged resemble the adult female, but have the colours paler. The bill and other bare parts are as in the female, the cere duller, and the eyelids of a livid colour

tinged with green. The general colour of the upper parts is dark brown, the feathers edged and barred with pale yellowish-red; the tail of the same colour, but the primary quills darker. The feathers of the back have each one, two, four or six concealed spots of light brownish-red, the secondary quills and their coverts are marked on both webs with similar spots, as are the primaries on the outer webs, on which, however, the spots are less distinct. The tail has five conspicuous bands of large pale reddish spots, the tips reddish-white, forming a sixth bar, besides which, there are at the base other three. The throat is yellowish-white, with shaft-lines of brown; the cheeks yellowish-red, streaked with brown, the latter colour forming a band from the angle of the mouth. The lower parts are pale reddish-yellow, with broad longitudinal streaks of umber brown, the upper hypochondrial feathers being of the same colour, some of them with round spots of greyish-yellow. A few of the lower tail-coverts have a slight central brown line towards the end. The males are easily distinguished from the females, as they are darker and tinged with blue on the back.

PROGRESS TOWARDS MATURITY.—The males gradually become of a darker tint, more tinged with blue above. The females undergo less change. A young male in an intermediate stage was as follows. Bill light blue, tipped with black; cere light green; eyelids greenish blue; tarsi and toes greenish-yellow, slightly tinged with blue, each feather with a central line of black. The general colour of the upper parts deep brown, slightly tinged with blue, each feather with a

central line of black. Hind neck yellowish; the feathers tipped with brown. Anterior dorsal feathers with one or two circular pale-red concealed spots. Quills, larger coverts, and alula, with regular series of roundish light-red spots on both webs, and tipped with the same but paler. Tail with five bars of pale reddish-brown spots, and a terminal band of greyish-white. A yellowish line over the eye; tips of longer auriculars brown; a line of brown-centred feathers from the base of the upper mandible; chin and part of the forehead yellowish-white; lower parts light reddish-yellow, marked with numerous oblong spots of brown; posterior hypochondrial feathers with four circular spots of yellowish-white; long tibial feathers marked with a brown line, short feathers white; abdominal and subcaudal feathers nearly spotless, a row of the latter on each side with a central line of pale brown.

Length $12\frac{1}{2}$ inches; extent of wings $36\frac{1}{2}$; tarsus $1\frac{5}{12}$.

REMARKS.—The Merlin is most closely allied to the American Pigeon Hawk, *Falco columbarius*, from which indeed it is difficult to distinguish it. In the reticulations of its tarsi, and in the form of its wings, it is more allied to the kestrel than to the hobby or peregrine falcon; and its elongated slender toes indicate an affinity to the hawks, properly so called.

It has long ago been remarked, that the male and the female of the Merlin differ very little in size; and although the authors who made the observation had a view only to those individuals which we know to be the females or young, but which they conceived to form a species apart from the males, I have found it

correct, so far as my own examination has gone. I have never seen a female merlin more than thirteen and a half inches in length, nor a male less than twelve. In this respect also the merlin is allied to the kestrel. Montagu, however, states that the length of a male which he has described was ten inches, and its weight about five ounces; while those of the female were twelve inches and a half, and nine ounces.

According to authors, the Merlin is generally distributed over Europe and the north of Asia. Dr Richardson found it in the British settlements in North America. It is said to be easily tamed, and was formerly employed in the chase, having been flown at larks, quails, and other small birds.

By the country people it is named the Sparrow Hawk, it being by them generally confounded with the bird which properly bears that name. The name Merlin is derived from the French Emerillon.

Falco Litho-falco. *Lath. Ind. Ornith.* vol. i. p. 47. Adult.

Falco Æsalon. *Lath. Ind. Ornith.* vol. i. p. 49. Female and Young.

Stone Falcon. *Mont. Ornith. Dict. Appen.* Adult Male.

Merlin. *Mont. d'Ornith. Dict.* Adult Male and Female.

Faucon Emerillon. Falco Æsalon. *Temm. Man. d'Orn.* p. 27.

Merlin. Falco Æsalon. *Selby, Illustr.* vol. i. p. 51.

Falco Æsalon. Merlin. *Flem. Brit. Anim.* p. 50.

ACCIPITER. HAWK.

BILL short, as broad as deep at the base : upper mandible with its dorsal line curved from the base and forming the fourth of a circle, the ridge convex, the sides sloping, convex towards the end, the edges sharp and overlapping, with a prominent festoon beyond the middle, the tip trigonal, concave beneath, and deflected ; lower mandible with the angle medial, broad and rounded, the crura sloping outwards and feathered, the dorsal line convex, the ridge broad, the edges inflected, soft at the base and straight, beyond the middle sharp and deflected, the tip obliquely truncate with a decurved line, and rounded.

Mouth rather wide ; palate flat, with two prominent longitudinal lines, upper mandible concave within and having a lateral groove on each side for the reception of the sharp inflected edges of the lower, which is more deeply concave. The nasal slit defended by acute papillæ, as is the glottis behind. Tongue short, fleshy, concave above, rounded and emarginate. **Œsophagus** rather wide, dilated into a crop about the middle, a little enlarged and glandular below ; stomach compressed, oblong, its muscular coat very thin ; intestine with two very small cœca near the extremity.

Nostrils ovato-oblong, in the anterior edge of the cere, half way between the ridge and edge of the bill. Eyes rather large; eyelids edged with bristly feathers, the upper overhung by a thin projecting plate. Aperture of the ear round, rather large.

Head of moderate size; the body light, rather broad and muscular anteriorly, very narrow behind; the neck of moderate length or rather short; the wings of moderate length; the legs rather long, slender; tibiae muscular; tarsi rather long, compressed, with oblique rhombic scutella anteriorly and on the outer edge, hexagonal or pentagonal scales on the sides, and oblong plates behind. Toes slender, free, the outer with a short web at the base connecting it with the third; first and second nearly equal, fourth longer, third much longer; all covered above with numerous narrow transverse scutella, beneath tuberculate and papillate, there being a long fleshy tubercle on the last joint of each toe, and one on the next joint of each of the two outer; claws long, compressed, rounded above, slightly concave and marginate beneath, curved nearly into a semi-circle extremely acute; those of the second and first toes largest, that of the third with an anterior sharp edge.

Plumage soft, rather compact and imbricated above, rather blended beneath. Cere bristly on the sides; space between the bill and eye sparsely covered with bristle-pointed feathers which are downy at the base. Feathers of the head rather short, those of the neck of moderate length, rounded like the rest; of the abdomen rather downy, of the outer part of the tibia elongated and rather loose. Wings long, much round-

ed; primary quills ten, fourth and fifth longest, first very short, the first five cut out on the inner edge; secondary thirteen, truncato-rotundate, nearly even when the wing is closed. Tail long, straight, even or slightly rounded, of twelve rather broad rounded feathers.

The species of which this genus is composed are very numerous, and some of them are found in all parts of the globe. The larger, which are also proportionally more robust, with thicker tarsi and shorter wings, have by many ornithologists been considered as constituting a separate genus or subgenus, to which the name *Astur* has been applied; while the smaller and more slender species have been formed into a group designated variously by the names of *Accipiter*, *Sparvius*, or *Nisus*. The transition from the one to the other is so gradual, that it seems to me unwarrantable to separate them; and even the two British species, of which one, the Goss Hawk, belongs to *Astur*, the other, the Sparrow Hawk, to *Accipiter*, although commonly considered as the types of these sections, do not differ so much as to render the propriety of separating them very apparent, even were there no other species known.

The larger species are generally stout, although not nearly so robust as the falcons or buzzards; and the smaller are generally very slender, although still muscular, especially on the anterior part of the body. Their wings, although short in comparison with the tail, are in reality long, being half as long again as the body. The tail itself is generally of the length of the body, neck and head; and being unencumbered with stiff or bulky feathers at the base, and with its basis

IPITER.

narrow and extremely mobile, forms a powerful instrument by which the bird is enabled to execute the most delicate as well as the most decided changes in the direction of its course. The species are extremely active, as daring as the falcons, and prey exclusively on living objects, which they seize with admirable dexterity. Their flight is commonly low, and as they pass over the fields or woods they dart upon their prey, whether it be in the air, among the branches, or on the ground. They neither soar to a great height, like the eagles, nor sail in circles like the falcons and buzzards, but skim along near the ground, with a rapid motion, sometimes proceeding straight forward, sometimes deviating to either side, and occasionally hovering over a field, or alighting on a stick or tree to look around them. It is unnecessary here to enter into any further details respecting their habits. The history of the two species which occur in this country will enable one to form a general idea of their nature, more especially if he compare with it that of the American species, *F. Stanleii* or *Cooperii*, and *F. pennsylvanicus*, as given by Wilson, Mr Audubon, and Prince Charles Lucien Bonaparte.

ACCIPITER PALUMBARIUS.

THE GOSS HAWK.

THE upper parts of the male deep bluish-grey, tinged with brown, the crown of the head and the ear-coverts brownish-black; feathers of the nape white, tipped with black; the lower parts white, transversely, barred with blackish-grey, the shafts black; length about twenty inches. Of the female the upper parts hair-brown, tinged with grey, the colouring in other respects similar; length about twenty-five inches.

MALE.—The Goss Hawk is one of the most beautiful of our birds of prey. In elegance of form it is not excelled by any, and in colouring it is superior to most. Its body is moderately robust, but not heavy; its neck rather short and strong; its head of moderate size, rounded, and flattened above; its wings of ordinary length, or, compared with those of other species, short; its tail long, ample, and possessed of great mobility. The bill is short, but strong, of nearly equal breadth and depth at the base; its dorsal line nearly straight and slightly sloping as far as the edge of the cere, then curved into the fourth of a circle, its sides sloping and slightly convex, its edges anteriorly sharp, with a broad process or festoon beyond the middle; its tip very acute, and at its extremity perpendicular. The cere is rather large, its margin forming on each side a convex

curve, which slopes away towards the angle of the mouth. The lower mandible has the angle broad and short, the dorsal line convex, the back broad and rounded, the sides convex, the sharp edges inflected, the tip obliquely truncate, rounded, with a shallow sinus behind.

The upper mandible within is nearly flat, with a prominent central line; the lower deeply concave, with a narrower prominent line. On the palate are two parallel papillate ridges. The palatal slit is narrow-oblong behind, linear before, laterally with two curved papillate lines on each side. The tongue is fleshy, sagittate and papillate behind, channelled above, the tip rounded and emarginate, its lower surface horny, with a shallow central groove.

The eyes are large; the eyelids bare, furnished with ciliary bristles on the margin. Nostrils in the fore part of the cere, oblique, oblongo-ovate, broader behind, aperture of the ear round and rather large.

The tarsi, which are anteriorly feathered rather more than a third down, are of moderate length, strong, slightly compressed, anteriorly covered with fourteen scutella, behind with twelve scutella, large hexagonal scales towards the upper, small roundish ones towards the lower joint, the sides reticulated. The toes are strong, the third and fourth connected by a web extending to the second joint of each; the first and second toes nearly equal in size, the fourth longer but much more slender, the third *much longer*. The bases of all the toes are reticulated with small roundish scales. On the first toe are six scutella, on the second four, on the third eighteen (some of them on the joints

divided), on the fourth ten. The claws are strong, considerably compressed, and very acute.

The cere is bare above, but on the sides covered with bristly feathers, like those of the loreal space, all being very slightly barbed at the base. The plumage of the upper parts is soft but compact, of the lower blended. The feathers are broad and rounded; those of the head short, of the outer part of the tibia elongated. The wings are of moderate length; the primary quills strong, tapering, but rounded; the first five sinuate on the inner web; the third, fourth, fifth and sixth, on the outer; the fourth longest, the fifth longer than the third, the second shorter than the sixth, the first equal to the ninth. The secondary quills, thirteen in number, are broad, abrupt, rounded, with a small sinus exterior to the acumen. The tail is long, ample, rounded, of twelve rounded but acuminate feathers.

The bill is light blue at the base, bluish-black towards the end; the cere greenish-yellow. The irides reddish-orange, the bare parts of the eyelids yellowish-green. The feet are yellow; the claws black.

The general colour of the upper parts is dark bluish-grey tinged with brown; the top of the head and the cheeks brownish-black; over the eye is a broad white line, spotted with black; the feathers of the nape white, tipped with brownish-black, the white appearing only when the feathers are raised. The alula, primary coverts and quills, are hair-brown, with reddish-brown shafts, the primaries barred with darker brown, and the inner margins of all whitish, especially towards the base. The tail is brownish-grey, with five broad bands of brownish-black, the terminal dark band much larger,

being an inch and a quarter in breadth, the tips white, the shafts yellowish-brown. The lower parts are greyish white; the fore-neck with longitudinal lines, the breast with transverse undulated bars of greyish-black, the tibial feathers similarly marked, the shafts of all the feathers black; the lower tail-coverts white, with a few slight dark markings. The feathers of the breast have generally four marks. The scapulars in not very old birds have two concealed broad white bars; but in very old birds they are nearly obliterated.

Length to end of tail 20 inches, to end of wings $16\frac{1}{2}$; extent of wings 43; wing from flexure 13; tail $11\frac{1}{2}$; bill along the back $1\frac{1}{2}$, along the edge of lower mandible $1\frac{2}{3}$, its depth at the base $\frac{1}{2}$; tarsus 3; first toe $1\frac{2}{3}$, its claw $1\frac{2}{3}$; second toe $1\frac{2}{3}$, its claw $1\frac{2}{3}$; third $1\frac{2}{3}$, its claw 1; fourth $1\frac{4}{5}$, its claw $\frac{1}{2}$.

FEMALE.—The female is much larger than the male, but differs very little in colour, the upper parts being of a browner tint.

Length to end of tail 26 inches, to end of wings $23\frac{1}{2}$; extent of wings 45; wing from flexure $13\frac{1}{2}$; tail 12; bill along the back $1\frac{7}{8}$, along the edge of lower mandible $1\frac{1}{2}$, its depth at the base $\frac{1}{2}$; tarsus $3\frac{1}{2}$; first toe $1\frac{2}{3}$, its claw $1\frac{3}{4}$; second $1\frac{3}{4}$, its claw $1\frac{7}{8}$; third $2\frac{2}{3}$, its claw 1; fourth $1\frac{5}{8}$, its claw $\frac{9}{16}$.

VARIATIONS.—The males vary in length from eighteen to twenty-one inches; the females from twenty-two to twenty-six or more. Younger individuals are generally more brown above, with the bars on the wings more distinct, and two broad white concealed bands on

the scapulars. From the character of the colouring, the changes which it undergoes from the action of the weather cannot be striking.

HABITS.—The Goss Hawk is a constant resident in Scotland, where, however, it is very rare. In England it appears to be still rarer. In the Orkney islands, according to Mr Low, and my friend Mr Forbes, it is not unfrequently seen: but in the outer Hebrides I am not certain of having observed it. In the more inland parts of the middle division of Scotland, especially among the Grampians of Aberdeenshire, it may now and then be observed; but the few opportunities of studying its manners which have occurred to me were so fleeting, that I can add nothing to its history in this respect. When you are least expecting its appearance, it sweeps rapidly past you, or is seen swiftly winging its way over the fields or woods with a bird in its talons. In so far as I am acquainted with it, it resembles the sparrow-hawk in its manners; but for a detailed account of these, I must refer to the works of Audubon and Wilson, this species being, according to the former author, more common in North America than it is with us. The little that Montagu gives of its habits and distribution, is repeated or confirmed by Mr Selby. Although differing in its flight from the peregrine and other falcons, the Goss Hawk was found equal to the best of them by the falconers, and was flown at partridges, grouse, pheasants, ducks, geese, herons, and cranes, as well as hares.

PROPAGATION.—According to M. Temminck, Mr Au-

dubon, and others, the Goss Hawk nestles in tall trees, and lays three or four eggs, of a bluish-white colour, spotted with reddish-brown. The nest is said to be very bulky, composed of sticks and coarse grass. The young are at first covered with buff-coloured down. It has been said by Pennant and others to breed in the pine-forests on the Dee and Spey; but who has seen its nest in Britain? and why do people talk as if they were familiar with it?

YOUNG.—The young birds differ so much in appearance from the old, that they have been mistaken for a different species. The bill is dark brown, paler at the base, the cere and legs greenish-yellow, the claws brownish-black. The head above is dark brown, the feathers edged with light yellowish-red. The hind neck is yellowish-white, streaked with dark brown, its lower part yellowish-red, with large dark brown spots. The general colour of the upper parts is hair-brown, the feathers edged with yellowish-red; the scapulars have three broad bands of whitish, which are not seen without raising the feathers. The quills are all tipped with whitish, and the primaries are barred with dark brown. On the tail are five broad bars of dark brown, and an equal number of light greyish-brown, the feathers largely terminated with white; the lower parts are light yellowish-red, or reddish-white; the throat, legs, and lower tail-coverts, with lines of blackish-brown, the upper part of the breast with longitudinal oblong bands, the lower part with lanceolate spots of the same colour. The changes from this to the adult state I am

unable to describe, not having had opportunities of observing them.

REMARKS.—I have compared British and French with American specimens, both in the adult and young states, and am perfectly persuaded that no real difference exists between them. Were we to found specific distinctions upon such trifling discrepancies as are exhibited by the Goss Hawk of America and that of Europe, we might find that our common ptarmigan, our bulfinch, wheatear, and kestrel, are each of two or three species. Cuvier, in my opinion very strangely, refers to the *Falco atricapillus* of Wilson, which is the American Goss Hawk, as a species of *Hierofalco*, that is, as intimately allied to the Jer Falcon. The only name by which this species is known in Britain, is that prefixed to this article, but variously written, Goshawk, Gos-hawk, or Goss Hawk, and apparently a corruption of Goose Hawk.

Falco Palumbarius. *Linna. Syst. Nat.* vol. i. p. 130.

Falco Palumbarius. *Lath. Ind. Ornith.* vol. i. p. 29. The old bird.

Falco gentilis. *Lath. Ind. Ornith.* vol. i. p. 29. Young.

Goshawk. *Montagu, Ornith. Diet.*

L'Autour, *Falco Palumbarius.* *Temm. Man. d'Ornith.* p. 55.

Gos-hawk. *Astur Palumbarius.* *Selby, Illustr.* vol. i. p. 29.

Buteo *Palumbarius.* Goshawk. *Flem. Brit. Anim.* p. 54.

ACCIPITER NISUS.

THE SPARROW HAWK.

THE upper parts of the male dark bluish-grey, with a white patch on the nape when the feathers are raised; the lower parts reddish-white, transversely barred with yellowish-red, the shafts dark brown; length about twelve inches. Of the female, the upper parts brown, tinged with grey, the lower greyish-white, transversely barred with dark grey; the length about fifteen inches.

MALE.—The Sparrow Hawk is of a very slender and elegant form, the body being extremely thin behind and narrow even at the fore part of the thorax; the head of moderate size, the bill small; the wings of moderate length; the tail long; the feet slender, and the toes, especially the middle one, remarkably elongated. The bill is short; the upper mandible has its dorsal line curved from the base, so as to form nearly the fourth of a circle, the sides sloping, the edges sharp anteriorly, with a broad tooth-like process or prominent festoon about the middle, the tip very acute and at its extremity nearly perpendicular. The cere is short, its margin forming a convex curve before the nostril, below which it is concave, and slopes toward the angle of the mouth. The lower mandible has the angle broad and short, the dorsal line convex, the back broad and rounded, the sides convex, the sharp edges inflect-

ed, the tip obliquely truncate, rounded, with a shallow sinus behind.

The upper mandible within is slightly concave; the lower deeply concave, with a slight prominent central line. On the palate are two parallel slightly papillate ridges. The palatal slit is narrow-oblong behind, linear before, laterally with two curved papillate lines on each side. The tongue, which is sagittate and papillate behind, is fleshy, oblong, channelled above, the tip rounded and emarginate, its lower surface horny, with a shallow central groove. The œsophagus, which is four inches and a half long, is thin, five-twelfths of an inch in diameter; above the middle dilated on the right side of the trachea into a crop capable of being distended into a bag one inch in diameter at the middle, and nearly two inches long. The proventriculus is eight-twelfths long, not contracted below, thick and glandular, with four slight longitudinal depressions internally. The stomach when distended is an oblong, slightly flattened bag, widest below, an inch and three-twelfths long, its muscular coat thin, the tendons about three-twelfths in diameter, the inner coat soft and without wrinkles. The pylorus is very narrow, with three soft protuberances, one smaller than the rest. The intestine, which is two feet six inches in length, has a diameter of three-twelfths as far as the entrance of the biliary and pancreatic ducts at about six inches from the pylorus, beyond which it gradually contracts to the cœca, where its diameter is two-twelfths. The cœca are two very small appendages, scarcely perceptible, adherent, two-twelfths in length, with a cavity dilatable to one-twelfth. They are three and a-half inches dis-

tant from the anus. The rectum is at first three-twelfths in diameter, but towards the end one inch.

The eyes are large; the eyelids are furnished with ciliary bristles on the margin; the upper bare, with the lachrymal bone prominent. Nostrils in the fore part of the cere, oblique, oblong, broader behind. Aperture of the ear round and rather large.

The tarsi, which are anteriorly feathered for nearly a third of their length, are rather long, slender, compressed, broader behind than before. On their anterior and outer part is a long plate, obscurely marked with eighteen scutella, of which the five lower are however distinct; the sides are covered with hexagonal scales, those on the inner partially obliterated, the posterior row large and scutelliform. In some individuals, the anterior oblique scutella, as well as the hexagonal scales of the sides, are so indistinct, that all traces of them disappear when the parts become dry. The toes are slender, the third and fourth connected at the base by a web extending beyond the second joint of the latter, and curving forward as far as that of the former; the first toe shortest, the second shorter than the fourth, the third much longer. On the first toe are eight scutella, on the second fourteen, on the third twenty-six, on the fourth fourteen, and a few smaller scales at the base. The claws are extremely attenuated towards the point.

The plumage of the upper parts is soft, but distinctly imbricated; of the lower softer and blended. The wings are of moderate length, reaching beyond the middle of the tail. The fourth quill is longest, the fifth scarcely shorter, the third intermediate between the sixth and

second, the first very short, equal only to the first secondary; or, the fourth is longest, the fifth nearly as long, in some instances the longest, the third equal to the sixth, the second to the seventh, the first to the tenth. The first five are slightly cut out on the outer, the first four more deeply on the inner edge. The secondary quills are thirteen, broad and rounded. The tail is long, even, of twelve rather broad, rounded feathers.

The bill is light blue at the base, bluish-black at the end; the cere and eyelids greenish-yellow; the iris orange. The palate is livid blue. The tarsi and toes are yellow; the claws black, pale bluish at the base.

The general colour of the plumage on the upper parts is deep greyish-blue, the shafts darker. The feathers on the occiput are white at the base, that colour appearing more or less as they are raised, and there is a large white spot on each of the scapulars, although it is not seen until the feathers are raised. The outer primaries are tinged with brown; all the quills are marked on the inner web with dusky bands, between which the inner margins are reddish-white. The tail has six broad bands of blackish-brown, and is tipped with greyish-white. The cheeks are yellowish-red, and the forehead is tinged with the same colour. The throat and fore part of the neck are pale red, which colour prevails on the breast and sides, where it is chiefly disposed in transverse bands; each feather, however, has five bands of white, and six of pale red and dusky; the shafts on the fore part of the neck dark, on the breast white, with two or three dark marks, on the abdomen white. The bars gradually disappear on the abdomen,

which, with the lower tail-coverts, is reddish-white. The long tibial feathers are similarly barred, the short ones light red. The long wing-coverts are pale red, barred with dusky, and the dark bars of the quills are more conspicuous on their under surface.

Length to end of tail 13 inches, to end of wings 11; extent of wings 23; wing from flexure $7\frac{1}{2}$; tail $6\frac{1}{4}$; bill along the back $\frac{3}{4}$, along the edge of lower mandible $\frac{3}{4}$; tarsus $2\frac{1}{2}$; first toe $\frac{7}{12}$, its claw $\frac{9}{12}$; second $\frac{8}{12}$, its claw $\frac{8}{12}$; third $1\frac{5}{12}$, its claw $\frac{6}{12}$; fourth $1\frac{1}{2}$, its claw $\frac{5}{12}$.

FEMALE.—The female is much larger than the male, the difference between the sexes being in no species more apparent than in this. The colouring also differs considerably, although the form and proportions are nearly the same. All that has been said as to the bill and intestinal canal of the male may be repeated here, the only difference being in the size of the parts. The œsophagus is about five inches long, five-twelfths in diameter; the crop two inches long, and an inch and one-twelfth in diameter when distended; the proventriculus eight-twelfths long. The stomach is an inch and three-twelfths long; the intestine thirty-three and a half inches, its largest diameter at the upper part three-twelfths and a half, its smallest at the cœca two-twelfths; the cœca two-twelfths in length, and placed at the distance of three inches and a half from the extremity; the rectum three-twelfths and a half in diameter, but enlarged towards the end to one inch.

The bill, palate, irides, and feet, are coloured as in the male. The general colour of the upper plumage is hair brown, tinged with grey (in old individuals bluish-

grey tinged with brown); the feathers of the hind neck white at the base; the shafts darker. The quills are all obscurely barred with dark brown, and have their inner webs, excepting towards the tips, yellowish-white in the intervals. The inner secondary coverts and scapulars have large bands or spots of white, which are apparent only when the feathers are raised. The middle feathers of the tail have four, the lateral five, dark bars; the tips white. The general colour of the lower parts is reddish-white; the throat marked with longitudinal lines of deep brown, the fore neck and breast transversely barred with brown, each feather on the breast having five bars; the abdomen less barred; the lower tail-coverts mostly pure white, some of the outer ones having a few dark markings; the lower wing-coverts light red, barred with dusky. The lower surface of the wings and tail is pale grey, more or less tinged with red, and barred with dark brown.

Length to end of tail 16 inches, extent of wings 26; wing from flexure $9\frac{1}{2}$; tail $7\frac{1}{2}$; bill along the back 1, along the edge of lower mandible $\frac{1}{2}$; tarsus $2\frac{1}{2}$; first toe $\frac{8}{12}$, its claw $\frac{1}{2}$; second $\frac{9}{12}$, its claw $\frac{1}{2}$; third $1\frac{7}{12}$, its claw $\frac{7}{12}$; fourth $\frac{11}{12}$, its claw $\frac{5}{12}$.

VARIATIONS.—The males vary in size, some being twelve, others thirteen, inches in length. In old birds, however, there is little difference of colour. The females are generally as described above; but in some the upper parts approach in colour to those of the old male, and they present considerable difference in the tints and markings of the lower parts; while in others the upper parts are scarcely tinged with grey, and the

feathers are edged with pale brownish-red. They vary in length from fourteen to seventeen inches. When of the latter size, and compared with a male peregrine falcon of the same length, the difference between the two birds in form amounts to a complete contrast. The colours fade a little, and become more or less ragged at the edges, towards the period at which the feathers are renewed, but the changes are not very remarkable.

HABITS.—In spirit and activity, the Sparrow Hawk is not surpassed by any of our native birds, and it may be contrasted with the eagles and buzzards, which possess these qualities in a very inferior degree. The British birds of prey that most resemble it in these qualities are the hobby, the merlin, and the kestrel. When searching for food, it moves along gently and silently, with easy flappings, alternating with short sailings or glidings, its head retracted, its tail extended and slightly spread. It often stops, hovers over some spot in a field, supporting itself in the air by a quick but gentle motion of the wings, then moves onward a hundred yards or so, and again stops to survey the subjacent objects, sometimes remaining for a considerable time almost motionless. On some occasions it will perch on a stump, tree, or wall, patiently explore the neighbourhood for a while, until, finding its search vain, it will fly off, or, observing a bird, glide rapidly towards it, and secure it in an instant. The rapidity with which it darts upon its prey is scarcely credible. In the spring of 1835, while looking at some pipits and a wag-tail, busily feeding in a field on the Braid Hills, on which three ploughs were going, I observed a small

hawk skimming along at some distance. It soon disappeared, when I resumed my occupation. The birds were at this time only a few yards from one of the ploughs, and I was waiting to get a shot without frightening the horses, when in a moment something came down obliquely through the air, and lighted among the titlarks. The motion was so rapid that I could not distinctly see the object, until a moment after, when it rose and quickly flew away in the form of a sparrow hawk, bearing in its claws one of the poor pipits.

At another time, while walking in one of the squares of Edinburgh (Moray Place), on the outside of the railing of its central shrubbery, I was startled by a whizzing noise, like that of a heavy body falling to the ground, when I perceived that, within three yards of me, a sparrow hawk had plunged after a thrush, which had sought refuge in the bushes. The hawk, notwithstanding the rapidity of its flight, thrud its way among the twigs, and next moment appeared in open day, bearing off its prey in its talons. It is doubtless on such occasions that the long, expansile, extremely mobile tail of the sparrow hawk comes into full play. In the island of Harris, where thrushes are very numerous, I have on two occasions seen one escape from the pursuit of a sparrow hawk, by flying into a house, and I have heard of other instances, for these hawks are also very numerous there.

The Sparrow Hawk, although among the smallest of our birds of prey, is by no means the least destructive to the feathered inmates of the farm-yard, although it does not venture to attack grown up fowls. "It is a great destroyer of game and young poultry," says

Montagu, " we have frequently known them carry away half a brood of chickens before the thief was discovered. They fly low, skim over a poultry yard, snatch up a chick, and are out of sight in an instant." " A neighbouring gentleman," says the amiable and justly celebrated author of ' The Natural History of Selborne,' " one summer had lost most of his chickens by a sparrow hawk, that came gliding down between a fagot pile and the end of his house, to the place where the coops stood. The owner, inwardly vexed to see his flock thus diminishing, hung a setting net adroitly between the pile and the house, into which the caitiff dashed and was entangled. Resentment suggested the law of retaliation; he therefore clipped the hawk's wings, cut off his talons, and, fixing a cork on his bill, threw him down among the brood hens. Imagination cannot paint the scene that ensued; the expressions that fear, rage, and revenge, inspired, were new, or at least such as had been unnoticed before. The exasperated matrons upbraided, they execrated, they insulted, they triumphed. In a word, they never desisted from buffeting their adversary till they had torn him in a hundred pieces." There was little sport, and much bad spirit, here; the gentleman manifested a pitiful spite, for which he ought to have been tarred and feathered. The hawk naturally conceived he had as good a right to the chickens as his featherless cousin, who ought first by gentle means to have persuaded him of his error, or, these failing, to have driven him off or shot him. The conservative organ was no doubt highly developed in him, but it must have been merely a process of that of selfishness. Cruelty and bad

taste, as well as bad feeling, are the principal characteristics of the action.

In January 1831, I observed a sparrow hawk fly over a field in the neighbourhood of Edinburgh. It was followed at a distance by a loose flock of small birds, which, however, soon dispersed. It proceeded leisurely over the field, at a height of from six to ten feet, moving gently along with slightly opened tail. After searching some minutes in this manner, it alighted on a twig in the field, where it remained in a nearly erect position until I put it up, when it flew along, surveying the ground as before; but finding nothing, glided over the top of the wall, at a height of a few inches, and flew off to renew its search elsewhere. I mention this merely because it affords a correct idea of the manners of the bird.

In July 1829, while walking along George's Street, I observed a sparrow hawk flying over the houses, with a train of about twenty swallows, which kept up an incessant chatter. This fact, the like of which every naturalist must have often observed, I introduce here in order to state all that I know on the subject. Birds of prey of all kinds are objects of terror to the animals on which they feed, at least to the mammalia and birds. Thus, the larks or partridges of a field over which a hawk is hovering, crouch motionless on the ground, and, under the influence of this panic, will even occasionally suffer themselves to be taken by man. On the other hand, a bird of prey is often seen to be annoyed by other smaller and weaker birds, not of a rapacious nature, which fly after it in scattered bands, some keeping beneath, some above it, but always at a consi-

derable distance. It is to be observed, however, that all small birds do not fly after hawks. Thus, I have never seen thrushes, blackbirds, wagtails, or wrens, pursuing a kestrel or sparrow hawk; nor do partridges fly after a goss hawk, nor grouse after a peregrine falcon. The feaser (*Lestris*) is sure to be attacked by terns when he appears among them; but I believe the common gull, the kittiwake, or the black-headed gull, seldom if ever molest him. Eagles are frequently assailed by ravens and skuas, but never by hooded crows, nor indeed by any other bird whatever, excepting the goss hawk, the peregrine, and some other hawks, when they happen to pass near their nests. Again, small birds often attack the cuckoo, which, although he may look like a hawk, is quite innocent; and should they meet with an owl in broad day, they neither scruple nor fear to reproach him. These are facts which most people have observed; but the explanation of them seems not very easy. The prevalent idea is this:—small birds being the natural prey of hawks, the former bear, and with good reason, a grudge against the latter; when a hawk is observed wending his solitary way over the fields, they call to each other, and collecting in a band, assume a certain degree of courage, which, combining with their hatred towards the marauder, impels them to pursue and to harass him. Attack him they dare not, for they are conscious of their inability to injure him; they therefore hover about him, venting their spite in loud execrations; and as some fly over and others under him, some to the right, and others to the left, the hawk is distracted so as to be unable to single out an individual. The small birds know this, and continue

their impertinent intrusion until tired of the sport. But, before this theory can be admitted, it will be necessary to shew that hawks are occasionally beset by the very species of small birds on which they habitually prey, which has not yet been done. How does a bird, which under ordinary circumstances manifests extreme terror at the sight of another, under other circumstances, muster sufficient courage to pursue it? Is it certain that a hawk is unable to single out a bird from a flock; or is there reason to think that a troop of swallows, which have no weapons that could inflict the least injury on a hawk, could in the smallest degree affect it with fear? It is observable in our own species, that cowards, the moment the danger is over, assume so much more courage than is natural to them, that in the midst of the excitement they will even make a venture which in ordinary circumstances they would not have courage to do. Well, the small birds that we speak of are all cowards in the presence of hawks at least, and when one of the latter comes unawares among them and carries off one, or passes over without pursuing them, they soon recover from the fright, and being elated beyond their ordinary state, in a degree corresponding to the previous depression, they muster spirit enough to go on for some time with a mock pursuit; and this seems to me to be the whole mystery solved in the matter of hawks. The cuckoo they probably mistake for a hawk, as did Aristotle and the ancients, and an owl is not less rapacious than a falcon, although by day he cannot see well, and is the less liable to frighten away the little braggarts.

Although the sparrow hawk is one of the shorter-

winged species, its agility and spirit gave it favour in the eyes of the falconers of old, who found it sufficiently docile, and quite expert at capturing small birds.

PROPAGATION.—In the Hebrides, the sparrow hawk breeds in the crevices of rocks; but in the wooded parts of the country it often takes possession of the deserted nest of a crow, or forms one for itself in a tree, or even a bush of no great height. The nest is bulky, flat, composed of twigs and some grass. The eggs, which are from three to five in number, are of a roundish or broadly elliptical form, an inch and seven-twelfths long, one and four-twelfths in diameter, of a bluish-white colour, blotched and spotted all over with deep reddish-brown. The young are abundantly supplied with food. Mr Selby relates, that, “in a nest containing five young ones, he found a lapwing, two blackbirds, a thrush, and two green linnets, recently killed, and partly divested of their feathers.”

White, in his “Natural History of Selborne,” gives an interesting account of a family. “About the 10th of July 1780, a pair of sparrow hawks bred in an old crow’s nest, on a low beech in Selborne Hanger; and as their brood, which was numerous, began to grow up, became so daring and ravenous that they were a terror to all the daws in the village that had chickens or ducklings under their care. A boy climbed the tree, and found the young so fledged that they all escaped from him; but discovered that a good house had been kept; the larder was well stored with provisions; for he brought down a young blackbird, jay, and house-martin, all clean-picked, and some half devoured. The

old birds had been observed to make sad havoc for some days among the new-flown swallows and martins, which, being but lately out of their nests, had not acquired those powers and command of wing that enable them, when more mature, to set such enemies at defiance."

YOUNG.—The young are at first covered with white or light-grey down. When fledged, they have the cere greenish-yellow, the bill dusky-brown at the end, bluish at the base, the iris light brown, the feet greenish-yellow, tinged with blue. The upper parts are reddish-brown, the lower reddish-white, and marked with large oblong dark brown spots; the central part of each feather being of that colour.

PROGRESS TOWARD MATURITY.—After the first moult the males are still reddish-brown on the head and hind neck, the central part of each feather being dark greyish-brown; the feathers of the back are of the latter colour, with reddish-brown margins, and on the scapulars are large white and brown spots. The lower parts are reddish-white, transversely barred with yellowish-red. The tail and wings are nearly as in the adult. The older the bird is, the purer does the bluish-grey tint of the upper parts become, the narrower and brighter the transverse bars of the lower. The females at this period, besides being larger, are distinguished by having the upper parts more brown, the lower more white, with the markings much larger. The white on the occiput is perceptible in both.

REMARKS.—One of the species most nearly allied to

this is the Sharp-shinned Hawk of America, *Falco verox* of Wilson and Bonaparte, which is about the same size, and similarly coloured. It has been remarked by two of my friends, that our sparrow hawk often flies late in the evening. When I have seen it on such occasions, however, I have been disposed to consider it, not as searching for food, but as returning homewards, perhaps from a long excursion.

In the British series we must now pass to groups more nearly related to the Buzzards than to the Hawks, properly so called. From *Haliaëtus* we have seen a double series proceeding:—on the one hand, *Pandion*, *Falco*, and *Accipiter*, which have now been described; on the other, *Aquila* and *Buteo*, which have also been described. After the latter come the genera *Pernis*, *Milvus*, *Elanus*, and, finally, *Circus*, which latter uniting the two series, or, if you will, completing the circle, leads us to the family of Owls.

The only vernacular English name that I have heard applied to the present species is Sparrow Hawk. Those Highlanders who still retain their original and most ancient language, name it An Speirsheog, although it also obtains from them the name of Clamhan. It is the bird described by my worthy friends, the chosen six, one of whom makes it a Buzzard, under the following names:—

Falco Nisus. *Linn. Syst. Nat.* vol. i. p. 131.

Falco Nisus. *Lath. Ind. Ornith.* vol. i. p. 44.

Sparrow Hawk. *Mont. Ornith. Dict.*

L'Epervier. *Falco Nisus.* *Temm. Man. d'Ornith.* p. 56.

Buteo Nisus. Sparrow Hawk. *Flem. Brit. Anim.* p. 55.

Sparrow Hawk. *Accipiter fringillarius.* *Selby, Illust.* vol. i. p. 32.

PERNIS. BEE-HAWK.

BILL shorter than the head, rather broader than deep at the base, compressed towards the end, strong, with a curved acute tip. Upper mandible with the cere large, the dorsal outline convex and sloping a little towards the edge of the cere, beyond which it is curved so as to form the fourth of a circle, the ridge rather narrow but convex, the sides sloping and a little convex, the edges overlapping, with a very slight festoon beyond the middle, the tip deflected, slightly concave beneath, very acute, its lower part nearly perpendicular. Lower mandible with the angle medial, broad and rounded, the dorsal line slightly convex, the sides convex, the edges sharp, inflected, slightly curved, the tip rather broad, with its edges decurved.

Nostrils narrow-elliptical, recurved, oblique, lateral, about half way between the edges and the ridge, near the fore edge of the cere. Eyes large; eyelids closely feathered, and destitute of ciliary bristles; the lachrymal bone small. Aperture of the ear transversely oblong, large.

Head of moderate size, flat above, broad behind, anteriorly narrowed; neck rather short; body rather elongated; wings very long; legs short, strong; tibiae short and muscular; tarsi short, strong, roundish, fea-

thered anteriorly about half their length, covered all round with flat hexagonal scales, of which the anterior are very large; those on the tarsal joint much smaller. Toes of moderate size, strong, the outer connected at the base with the third by a pretty large web, the latter with the second by a rudimentary web; the first much shorter than the second, which is a little shorter but stronger than the fourth; the third much longer; all covered above with transverse series of large angular scales, unless towards the end, where there are a few scutella; laterally and beneath with prominent rough tubercular scales. Claws long, curved, tapering, acute, convex above, concave beneath, those of the first and second toes nearly equal, the third largest and with an inner sharp edge.

Plumage soft but compact, and rather glossy above. Cere quite bare, without any bristles; space between the bill and eye densely covered with very small imbricated, oblong, rounded, compact feathers, as is the space margining the base of the lower mandible. Feathers of the head rounded, of the hind neck broad and rounded, of the rest of the upper parts broad and rounded, of the fore-neck narrower and acuminate, as are those of the lower parts, although they are broad. The feathers of the abdomen and tibiæ are not downy or loose as in most other genera. Wings very long, broad, rounded, the third quill longest, the first about the length of the sixth; the primary quills strong, broad at the base, tapering, but rounded at the end, the outer five abruptly cut out on the inner web; the secondary quills thirteen, very long, very broad, broadly rounded, with a minute acumen. Tail long, ample, even in the

middle, rounded at the sides, of twelve broad, rounded but acuminate feathers.

The genus *Pernis*, which was first instituted by Cuvier, is represented in Europe by the species commonly known by the name of Honey Buzzard, *Pernis apivorus*. It is from that species alone that I have constructed the above generic character, which therefore requires revision. It is intermediate between the buzzards and the kites. From the former it differs in having the bill more elongated, the cere broader, the feet much shorter, the tarsi anteriorly scaly instead of being scutellate, the second toe proportionally longer, the general form more elongated, the wings and tail much longer. The plumage of the head differs not only from that of the buzzards, but of every other genus of this great family known to me, there being no bristles about the bill, or on the eyelids, but the loreal spaces and eyelids covered with small compact imbricated feathers. These characters point out the genus *Pernis*, not only as quite distinct, but as better marked than any other in the family, excepting *Gypogeranus*.

“The nearest approach to this genus (and by which it becomes closely allied to the other buzzards) appears to be *Buteo Lagopus*, where a covering of small downy feathers is visible beneath the projecting hairs.” So says Mr Selby, and Mr Swainson states that the lores of *Buteo lagopus* are “furnished with black hairs, which are disposed in a stelliform manner over a dense covering of white feathers.” I am glad to find that people look so closely, although after the publication of one of my papers on feathers, an ornithologist in-

formed me that characters could never be derived from those organs, and another told a friend of mine that feathers were of no value in this respect, and that, even if they were, colour was much better. Yet both the above statements are incorrect; for neither have the buzzards a dense covering of white feathers, over which are black hairs, nor do their loreal feathers exhibit any particular affinity to those of *Pernis*. The latter are small compact feathers without bristle-tips, the former small downy feathers with the shaft prolonged into a bristle or hair. For the accuracy of this I appeal to my readers and the birds in question; and for any errors which I may commit I request no indulgence whatever, being convinced that plain truth only can advance our knowledge of either buzzards or kites.

In my opinion, the nearest approach to the honey pernis is the common kite, and the nearest allied genera to the present, *Buteo* on the one hand, and *Milvus* on the other. The bill is so much alike in all that, so far as it is concerned, the three genera might very well be united. Our pernis is also allied to the kite in its feet, as well as in its long wings and elongated tail, although the feathers of the latter organ are differently proportioned.

Of all the other alleged species of this genus I cannot speak with decision; but the *Pernis cristatus* of Cuvier seems to me to be a buzzard, as it has the bill larger, the loreal feathers bristle-tipped, and the tarsi scutellate.

PERNIS APIVORUS.

THE BEE-HAWK, OR HONEY-BUZZARD.

OF the male the head to beyond the eyes, and the cheeks, grey, the upper parts deep umber brown, the throat white, with longitudinal dark lines, the rest of the lower parts white, with broad bands and spots of brown, the tail with two basal and a broader subterminal band of brownish-black, its tip brownish-white; length about twenty-four inches. Of the female the forehead bluish-grey, the upper parts deep umber-brown, the lower pale yellowish-red, with large reddish-brown spots; length about twenty-six inches. The young with the head white, spotted with brown, the upper parts deep brown, the feathers broadly edged with yellowish-brown, the lower parts light yellowish-red spotted with brown.

MALE.—The Bee-eating *Pernis*, or Honey Buzzard, is a bird of very elegant form, remarkable among our rapacious species for its comparatively small head, short legs, rather slender body, and long wings and tail, in which circumstances it approaches to the kite. Of the bill, which has been described in the generic character, it is only necessary to mention, that, although smaller than that of the buzzards, and much less robust than that of the falcons, it is by no means feeble, as represented by many persons. The eyes are large, the eyelids densely feathered, with papillate margins, destitute of ciliary bristles. The head is flattish above, broad

behind, narrowed before; the neck rather short. The tarsi, which are feathered anteriorly about half way down, are covered all round with flat hexagonal scales, of which the anterior are very large, and six in a line; on the anterior part of the tarsal joint there are five transverse series of small square scales. The toes, which are of moderate length and strong, but compared with the tarsus long, are covered above with transverse series of scales, enlarging towards the ends, where they change into scutella, of which there are four on the first, three on the second, three on the third, and four on the fourth. The claws are long, comparatively slender, extremely acute, curved in about the fourth of a circle, their back convex, the sides nearly flat with a slight groove, the lower surface flat with thin edges, the first and second nearly equal, the third largest, the fourth much smaller than the first.

The plumage is soft but compact, rather glossy on the back and wings. The cere is quite bare, but the eyelids are covered with small close feathers. Those of the loreal spaces, fore part of the head, and at the base of the lower mandible, are very small, ovate, rounded, compact and imbricated. The feathers of the cheeks are also shorter than usual, but less compact; those of the rest of the head are short and rounded. It is principally on account of the nature of its plumage that the head of this bird seems smaller than that of the buzzard. Feathers of the neck broad and rounded, as are those of the upper and lower parts; the elongated feathers of the tibia, and those of the abdomen, more compact than usual. The wings are very long, broad, and rounded. The primary quills are strong and broad;

the first five are deeply sinuate on the inner web, and beyond the sinus have their edges nearly parallel until near the rounded tips; the secondary quills are thirteen, very long, broad, and broadly rounded, with a minute acumen. The tail is nearly as long as the body, neck and bill together, straight, even, but with the lateral feather on each side a little shorter.

The bill is black, as is the naked cere. The irides are said to be yellow, as are the tarsi and toes; the claws black. The head to behind the eyes, the auriculars, and the short feathers margining the lower mandible, are light brownish-grey, not bluish-grey, as many authors state; that colour gradually passes on the hind head into deep umber brown, which is the general colour of the upper parts, the whole, however, shaded with grey, and the shaft of each feather with a patch on the centre being blackish-brown. All the feathers are white at the base, and those of the hind neck are white for two-thirds of their length. The larger wing-coverts and scapulars are brownish-grey in the middle; the secondary quills are grey in the middle, faintly barred with brown, brownish-black towards the end, the margins of the tips pale brown. The alular feathers and primary quills are similar, their grey part sprinkled with brown dots, and a large portion of their inner webs white. The tail feathers are umber brown tinged with grey; the base for a very small extent is white, that colour succeeded by a bar of deep umber; then within half an inch is another bar of the same colour, partially concealed by the tail-coverts; the next brown bar, which is all exposed, is a little more than half an inch distant; and at an interval of six inches, having

six faint bands of brown, is a subterminal bar of blackish-brown, an inch and a half in breadth; the tip brownish-white; the inner webs being paler, the bars are more distinctly seen upon them. The sides of the neck are greyish-brown above, umber brown below: the throat white, marked with brownish-black shaft-lines; the lower part of the neck anteriorly pale brown, with brownish-black shaft-lines; the breast, sides, abdomen, and lower tail-coverts, white, with broad transverse bands of umber brown, becoming darker backwards. These bands are formed in this manner:—the feathers of the lower neck have a large terminal triangular spot, those of the fore breast have a similar spot, and about the middle a band; those on the lower breast and sides a spot and two bands; the long feathers of the leg, a spot and three bands; those of the abdomen two, the lower tail-coverts three, the axillar feathers four bands. The outer lower wing-coverts are chocolate brown, the rest banded with white and brown; the lower surface of the quills and tail-feathers is pale grey, with white shafts, and three bands of brownish-black, two being sub-basal and one terminal.

Length to end of tail 24 inches, to end of wings 23; extent of wings estimated at 50; wing from flexure $15\frac{3}{4}$, tail 10; bill along the back $1\frac{2}{2}$, along the edge of lower mandible $1\frac{8}{2}$; tarsus 2; first toe $\frac{10}{2}$, its claw $\frac{11}{2}$; second $1\frac{4}{2}$, its claw 1; third $1\frac{8}{2}$, its claw $1\frac{14}{2}$; fourth $1\frac{4}{2}$, its claw $\frac{10}{2}$.

FEMALE.—According to authors, the female, which is considerably larger, has the fore part of the head grey, the upper parts as in the male, the lower pale

yellowish-red, with bands and spots of brownish-red. The young are said to be similar; but as I have not seen good specimens of either female or young, I am unable to give their dimensions, or even to describe their colouring with accuracy.

VARIATIONS.—On this subject little can be said here, although it would appear, from the brief and otherwise imperfect descriptions given by authors, that this species varies like the common and rough-legged buzzards. An individual described by Montagu agrees with the above, only the breast and belly were light brown, although similarly barred. Another described by the Hon. H. T. Liddel, had “all the under parts of a dark chocolate brown.” Willughby’s bird was similar to mine, having the ground colour of the lower parts white.

HABITS.—The honey buzzard is of very rare occurrence in England, and has not, I believe, been yet observed in Scotland. The few individuals seen in this island appear to have been summer visitants. It may have been more plentiful formerly, for Willughby states that, in his time, it was pretty frequent in England:—“*apud nos satis frequens est.*” Dr Latham, on the contrary, never received more than one fresh specimen, and Montagu was convinced “of the very great scarcity of this bird in England.” White makes mention of a pair that had a nest in his neighbourhood; Montagu describes one that “was killed in Lord Carnarvon’s park at Highclere in Berkshire;” a specimen was shot some years ago near Wallington in Northumberland;

a fine male, shot in 1829, in Thranton Wood, Northumberland, has been described by the Hon. H. T. Liddel, of Ealington House, in the Transactions of the Natural History Society of Northumberland, Durham, and Newcastle-upon-Tyne; an individual, with the head and neck white, killed in 1831, at Cheswick, near Berwick-on-Tweed, has been described by Mr Selby in the second volume of the same work; and the Rev. Messrs Sheppard and Whitear mention one shot near Yarmouth, and deposited in Mr Sabine's collection.

Montagu's bird was seen skimming over a large piece of water, probably in pursuit of insects; Mr Liddel's, when killed, was pursuing a wood pigeon; but of the peculiar habits of the species scarcely any thing is known. Nevertheless, a person, who in all probability has never seen a honey buzzard alive, informs us very gravely that "its motion, when hawking for its food, especially for dragon-flies near the pools and streams, is very light and gliding; and it slides," quoth he, "through the branches of trees with more apparent ease than could be expected in a bird of so large size." The following articles are mentioned by Temminck, Selby, White, and Willughby, all trust-worthy persons, as constituting the food of this species:—hamsters, moles, mice, birds, frogs, lizards, snails, wasps, bees, larvæ of the two latter, green caterpillars, and other matters.

PROPAGATION.—Dr Fleming, borrowing from Willughby, states that it breeds in trees, and has grey eggs marked with obscure spots:—"ova huic cinerea sunt maculis obscurioribus varia." "In a nest robbed at Selborne," he adds, "there was one egg smaller, and not

so round as the common buzzard." But even a buzzard, unless very hungry, would hardly think it worth while to pick carrion, and there is no want of wholesome game. The passage alluded to in White's Natural History of Selborne is this:—"A pair of honey buzzards, *Buteo apivorus*, sive *vespivorus*, Raii, built them a large shallow nest, composed of twigs, and lined with dead beechen leaves, upon a tall slender beech, near the middle of Selborne Hanger, in the summer of 1780. In the middle of the month of June, a bold boy climbed this tree, though standing on so steep and dizzy a situation, and brought down an egg, the only one in the nest, which had been sat on for some time, and contained the embryo of a young bird. The egg was smaller, and not so round, as those of the common buzzard, was dotted at each end with small red spots, and surrounded in the middle with a broad bloody zone."

Willughby states that it forms its nest of twigs, and lines it with wool. "We have seen one," he says, "that made use of the deserted nest of a kite, and fed its young with the larvæ of wasps, for there were in the nest wasps' combs, and fragments of the same were found in the stomach of the young. There were two young birds, clothed with white down, spotted with black. Their feet were pale yellow, the bill between the nostrils and the head white; the stomach was large, and contained lizards, frogs, &c. In the gullet of one of them were found two entire lizards, whose heads extended up to the bill, as if they had been seeking to escape."

Temminck says "it nestles in woods, on tall trees,

lays small yellowish-white eggs, marked with large reddish-brown patches, often entirely of that colour or with numerous spots so close together that the white is scarcely perceptible."

An egg, from France, in the Museum of the University of Edinburgh, is of a broad elliptical form, two inches and half a twelfth in length, one inch and six and a half twelfths in its greatest diameter, white, with blotches of greenish-brown. It is old, however, and I have observed that reddish-brown or umber on eggs generally becomes greenish-brown from the action of light.

REMARKS.—Under this head I have to state, that the specimen from which my description of the male has been taken, was kindly lent to me by my highly esteemed friend John Bushnan, Esq., Dumfries, a gentleman not less respectable for his attainments in natural history, than deserving of my gratitude for his readiness to forward my views with respect to it. All the other birds of this species that I have seen were stuffed specimens; and I have not found any account of the intestinal canal, excepting Willughby's very brief notice: "Intestines shorter than in the common buzzard; appendices (or *cæca*) short but thick. In the stomach and intestines of that which we dissected, there was found a vast number of common green caterpillars and others." The bird must have been in a state of disease, otherwise the worms could not have got into its intestines.

Buffon, whose description of this bird is compiled, states that it is taken with snares, it being in winter

very fat, and tolerable eating. Mr Liddel's specimen was so "excessively fat that its grease ran from the holes pierced with the shot, and rendered it a difficult task to preserve the skin clean for stuffing, as it flowed down the blade of the knife and over the hands of the operator."

Honey Buzzard and Capped Buzzard are the only vernacular names of this bird, which I have ventured to call the Bee-Hawk. The generic name cannot with propriety be rendered into English by Honey Buzzard. Neither perhaps, for a similar reason, ought it to be translated Bee-hawk; because the other species are perhaps neither honey-eaters nor bee-eaters; but I cannot devise a better name, and shall be ready to adopt one when it is found by another. The phrase Honey Buzzard is merely a specific name, such as Turkey Buzzard or Night Hawk, which are applied to birds that are neither buzzards nor hawks.

Falco apivorus. *Linn. Syst. Nat.* vol. i. p. 130.

Falco apivorus. *Lath. Ind. Ornith.* vol. i. p. 25.

Honey Buzzard. *Mont. Ornith. Dict.*

Buse Bondrée. *Falco apivorus.* *Temm. Man. d'Ornith.* p. 67.

Pernis apivorus. *Flem. Brit. Anim.* p. 52.

Honey Buzzard. *Pernis apivorus.* *Selby, Illust.* vol. i. p. 62.

MILVUS. KITE.

BILL shorter than the head, wide at the base, deep and much compressed towards the end, strong, with a curved acute tip; upper mandible with the cere large, the dorsal outline slightly convex, and sloping a little to the end of the cere, beyond which it is curved so as to form the fourth of a circle, the ridge at the base broad and rather flattened, towards the end narrow but convex, the sides sloping rapidly and nearly flat, the edges overlapping, with a festoon beyond the middle, the tip deflected, nearly flat beneath, tapering, rather blunt, its lower part nearly perpendicular; lower mandible with the angle medial, broad, and rounded, the dorsal line slightly convex, the sides convex, the edges sharp, inflected, slightly curved, the tip rather narrow, with its edges decurved.

Mouth wide; palate flat, with two prominent papillate longitudinal lines; upper mandible internally flat-tish, with a central ridge and projecting margins, the lower deeply concave within, forming a broad groove; the palatal slit defended by minute acute papillæ; aperture of the glottis margined behind by numerous papillæ projecting backwards. Tongue short, fleshy, rounded, emarginate, posteriorly sagittate and papillate. Œsophagus wide, slightly dilated about the middle, glandular and enlarged at its lower part. Stomach

oblong, the muscular coat thin, the two lateral tendons distinct, the inner coat smooth. Intestine slender, nearly uniform in diameter throughout, the rectum much dilated towards its extremity.

Nostrils elliptical, rather small, oblique, lateral, nearer the ridge than the edge, and close to the convex anterior margin of the cere. Eyes large; eyelids feathered, and furnished with ciliary bristles; the superciliary ridge prominent. Aperture of the ear large, roundish.

Head of moderate size, ovate, rather flattened above, anteriorly narrowed; neck short; body compact, ovate, compressed behind; wings very long. Legs very short, strong; tibiae short and muscular; tarsi very short, roundish, feathered before nearly half their length, anteriorly covered with a few large scutella, laterally and behind with angular scales, those on the tarsal joint, small and in transverse series; toes of moderate size, strong, the outer connected at the base with the third by a pretty large web, the latter with the second by a rudimentary web; the first nearly equal to the second, which is a little shorter and stronger than the fourth; the third much longer; all covered above with large scutella, the lateral toes having transverse series of scales at the base, laterally and beneath with prominent rough tubercular scales; claws long, curved, tapering, very acute, concave beneath, those of the first and second toes nearly equal, that of the third longest, and with an inner sharp edge.

Plumage soft, slightly glossed, rather blended. Cere bare on its upper part; space between the bill and eye closely covered with narrow bristle-tipped feathers, which are downy at the base. Feathers of the head of

moderate length, narrow and pointed; those of the fore-neck, breast, and lower parts in general, oblong and tapering; on the hind neck similar, on the rest of the upper parts broadly ovate and rounded; of the abdomen and tibiæ loose. Wings extremely long, broad, and pointed, the fourth quill longest, the third nearly equal, the second considerably, and the first much, shorter; the primary quills strong, broad at the base, tapering, but rounded at the end, incurved, the outer five cut out on the inner web; secondary quills thirteen, long, very broad, broadly rounded, with a minute acumen. Tail very long, ample, more or less forked, of twelve broad rounded feathers.

The kites, of which our own species and the Etolian or Black Kite, *Falco ater* of Gmelin, are characteristic examples, have the bill very similar to that of *Pernis apivorus*, to which they are also related in their general form; but from which they are distinguished by the still greater length of the wings and tail, the peculiar incurvation of the longer primary quills, and the forking of the tail. The genus *Elanus*, composed of *Falco furcatus* of Linnæus, and several other species, has the bill and tail very similar to that of *Milvus*; but the tarsi are reticulated in front, the toes are shorter, and the wings, although also extremely long, have the outer primaries straight, and differently proportioned as to length. The species of both genera are remarkable for their extreme buoyancy of flight, and the extraordinary facility with which they seem to glide through the air. The kites prey chiefly on reptiles, small quadrupeds and birds, sometimes fishes, and occasionally dead animals of various kinds; the *Elani* feed

principally on insects, and are farther remarkable for devouring their prey on wing. Of one species of this latter genus, the *E. furcatus*, an individual or two have been seen in Britain; but it seems to me to have no more right to be included in a description of British birds than the *Loxia astrild*, of which I have a male that was shot near Edinburgh in June 1835; the cardinal grosbeak, of which I have seen a specimen killed near Dalkeith; or the passenger pigeon, which Dr Fleming mentions as having occurred in Fife. With respect to that bird, then, it may suffice that I refer to Mr Audubon's description and figure of it:—Swallow-tailed Hawk, *Falco furcatus*. Ornith. Biogr. vol. i. p. 368. Birds of America, Plate lxxii. Male. Should one meet with it, which is not more likely than that he should fall in with an Albatross, he may readily distinguish it by its long deeply forked tail, its white colour beneath, and its black wings, back and tail.

MILVUS REGALIS.

THE COMMON KITE.

OF the adult male, the upper parts brownish-red, with narrow longitudinal blackish-brown markings, the outer primaries black, the lower parts of a lighter red, with narrower central lines on the feathers. Of the female, the head and upper neck greyish-white, with longitudinal dark lines, the other parts nearly as in the male. The young of a deeper red, with the central markings of the feathers broader. The species is distinguished from all the British birds of the falconine family by having the tail forked.

MALE.—The kite, notwithstanding the little estimation in which it is held when compared with the falcons, is a very beautiful bird, remarkable especially for the great length of its wings and tail, in which respect it excels all the British species of the family, and for the ease, buoyancy, and elegance of its flight, in which it resembles the birds of the genera *Lestris* and *Larus*. Its body is short, compact, ovate, compressed behind; the neck very short; the head of moderate size, ovate, rather flattened above, and narrowed before. The bill is in all respects as described in the generic character, its festoon distinct.

The mouth and parts connected with it, as well as the organs of sense, and the feet, differ in no respect

from the general description already given, so that it is only necessary here to present some additional particulars, omitting the dimensions of the intestinal canal, which I have not measured in the male. The first toe has three large scutella and four series of scales, the second four scutella and four series of scales, the third eleven scutella, the fourth seven scutella and five series of scales. The plumage is rather compact, slightly glossed, the feathers very downy at the base, with a rather large tufty plumule, and the general coating of down is abundant, and extremely soft. The preocular region is covered with slender downy bristle-pointed feathers; the ciliæ are distinct and large; the feathers of the head and neck narrow and pointed, of the back ovate-oblong, rounded, of the lower parts and sides rather narrow, those of the abdomen almost entirely downy. The primary quills are broad at the base, narrowed towards the end; the fourth longest, the third a little shorter, the fifth nearly as long, the second considerably shorter, the first three inches and a quarter shorter than the second. The first five quills are deeply cut out on the inner web towards the end, the second, third, and fourth, slightly so on the outer. The secondary quills are very broad, rounded, with a minute acumen. The primary coverts are rounded, the secondary coverts broadly rounded and incurvate; the alula large. The tail is very long, forked, of twelve broad, nearly straight, broadly rounded feathers, the outermost curved a little outwards at the tip; the two middle feathers shortest, the others gradually more elongated; the tip of the outer feather not exceeding that of the next more than the latter exceeds that of

the one preceding it. The wings, when closed, reach to two inches from the end of the tail.

The bill is brownish-black towards the end ; its base, as well as its soft margins, and the cere, are of a rich yellow. The superciliary prominence and the eyelids are dull yellow ; the margins of the eyelids dusky, the iris primrose-yellow. The feet are of a rich yellow tint, the claws brownish-black.

The plumage of the head and hind neck is light brownish-yellow, longitudinally streaked with dark brown, the tips of the feathers on the former greyish-white ; the lower part of the forehead, the cheeks, and the throat, are greyish-white, with brownish-black shaft-lines. The upper parts in general are light brownish-red ; there is a narrow lanceolate brownish-black mark along the centre of each feather, larger on the scapulars. The posterior part of the back is light red. The alula, primary coverts, and outer primary quills, are of a very deep indigo or raven black ; excepting the two outer, however, the primaries are greyish-brown on the greater part of the outer web, of a paler tint barred with brownish-black on the inner, the marginal part of which is yellowish-white. The secondary quills are greyish-black, shaded with purple, their tips reddish-white, their inner webs more or less mottled ; the longer inner secondaries are similar to the feathers of the back, and banded with dusky on their inner webs. The tail is brownish-red, the greater part of the outer webs of the two outer feathers blackish-brown, the inner webs faintly banded or mottled with that colour, their inner edges reddish-white. The fore-neck, breast and sides, are light yellowish-red, each feather with a very nar-

row, tapering, central dark brown band, its tip reddish-white. The abdominal feathers and lower tail-coverts are paler, and without dark markings, but with the shafts dark brown until near the end. On the upper parts the shafts of all the feathers are dark brown or black.

Length to end of tail 26 inches, to end of wings 24; extent of wings 62; wing from flexure 18; tail to end of longest feather $14\frac{1}{2}$, to end of shortest $11\frac{1}{2}$; bill along the ridge $1\frac{1}{2}$, along the edge of lower mandible $1\frac{7}{17}$; tarsus $1\frac{7}{12}$; first toe $\frac{1}{2}$, its claw $1\frac{5}{12}$; second $\frac{1}{2}$, its claw $1\frac{9}{12}$; third $1\frac{1}{2}$, its claw $\frac{3}{2}$; fourth 1, its claw $\frac{8}{12}$.

FEMALE.—The female, which is considerably larger, does not differ materially from the male in colouring. The differences may be briefly expressed by stating that the head is paler, and tinged with grey, the neck also lighter, and the upper parts of a deeper tint. The following description is that of a fine old bird sent to me from Nairnshire, in April 1832, by William Stables, Esq.

The bare parts were as described above; the tongue and mouth yellow; the first and fourth claws black, the second and third blackish-brown, the second with the back and tip, the third with the tip, horn-colour. The head and upper neck greyish-white, streaked with brown. The general colour of the upper parts brownish-red, longitudinally marked with dark brown, each feather having the central part of the latter colour, which prevails on the back, while the light red predominates on the wing-coverts. Alula, primary coverts, and five outer primaries blackish-brown; the other pri-

primaries greyish-brown, the secondaries deep brown, the last or inner greyish-brown. Basal inner webs of primaries white, of secondaries grey, all more or less mottled and barred with dark grey. Shafts of quills dark, those of the second and third primaries mottled with white. Upper tail-coverts light red, each feather having a central line of brownish-black. Tail light red, the two middle feathers paler, the outer dusky on the outer web; all more or less distinctly barred with deep brown, the bars of the middle feathers confined to the centre of the basal half, those of the outer extending along its whole length, and eighteen in number. The larger scapulars brownish-grey towards the end. The lower parts, sides, and tibial feathers, light red, paler on the neck, deeper on the sides, brighter on the legs, longitudinally streaked with blackish-brown, the streaks broad on the lower neck, breast, and sides, narrow on the legs. The lower tail-coverts pale red, with a central dark line.

Œsophagus wide, at the lower part glandular, and gradually dilated into the stomach, which is compressed, of an oblong slightly curved form, with two distinct central tendons, the muscular coat very thin. The intestine is a little wider at its upper part, but is nearly uniform in diameter until towards its termination, when it becomes much dilated. The entire length of the intestinal canal, from the mouth to the anus, is five feet ten inches; the length of the œsophagus seven, of the stomach two, inches. The liver of two nearly equal lobes. Gall-bladder of a globular form, and very large.

The ovarium contained a mass of eggs of various sizes, and the whole of the abdomen, with part of the

breast, was perfectly bare, the bird having been incubating when it was shot.

Length to end of tail $27\frac{1}{2}$ inches, to end of wings $25\frac{1}{2}$; extent of wings 64; wing from flexure 19; tail 15; bill along the ridge $1\frac{3}{4}$, along the edge of lower mandible $1\frac{3}{4}$; tarsus $2\frac{1}{4}$; middle toe and claw $2\frac{3}{4}$.

VARIATIONS.—Individuals vary a little in size, but less than in many other species of the family. The variations in the colouring of the males are not remarkable; those of the females consist chiefly of a lighter or deeper tint, and the shading of grey which the upper parts acquire in old individuals. As the period at which the feathers are to be renewed approaches, they become pointed and ragged in consequence of abrasion. The light-coloured tips and edges being worn, the general colour becomes of a more uniform red, but as it also fades, the difference produced is not remarkable.

HABITS.—The kite is permanently resident in Britain, although in certain districts it seems to shift its quarters at different seasons. In some parts of England and Scotland it is of not unfrequent occurrence, while in other extensive districts it is extremely rare, or never seen at all. I have observed it in the counties of Aberdeen, Stirling, and Argyll; but in the Hebrides, and in the southern division of Scotland, I have never met with it. As a proof of its rarity in the latter district, I know of only one specimen that came through the hands of the bird-stuffers in Edinburgh, in the course of eight years. Montagu remarks, that in twelve

years' residence in Devonshire he never observed but one in the southern districts of that county. In the eastern and midland parts of England, however, it is not very uncommon, as appears from the testimony of various writers.

This beautiful and interesting bird is remarkable among our predatory species for its peculiar flight. The body being very light in proportion to the expanse of wings and tail, a buoyant, gliding, and rather unsteady flight is produced, which in some measure resembles that of the larger gulls, and especially the *Lestris parasiticus*. Birds of this character do not proceed by means of quick beatings of their wings, although their progress may occasionally be extremely rapid; and the kite, instead of flying like the peregrine or the wood pigeon, both heavy birds, but furnished with powerful wings and tail, moves along in beautiful curves and circlings, with scarcely perceptible motions of its wings, but balancing itself by means of its very long and expansile tail. It sometimes, like the Eagles and Buzzards, ascends to a vast height, and continues for a long time to sail in circles, apparently for the mere purpose of amusing itself, or of gently exercising its muscles, for the effort of ascending to this elevation cannot be in any degree comparable to that used even by a Highlander in ascending a hill, and the upper fields of air once gained, the kite can float at ease and in security. But when searching for prey, it flies at the height of from thirty to a hundred feet, wending its curving way in gentle sweeps, constantly moving its partially expanded tail to either side, and slightly drawing in and extending its long wings. To quote the words of Buf-

fon, who has well described the flight of the kite, "one cannot but admire the manner in which it is performed; his long and narrow wings seem immovable; it is his tail that seems to direct all his evolutions, and he moves it continually; he rises without effort, comes down as if he was sliding along an inclined plane; he seems rather to swim than to fly; he darts forwards, slackens his speed, stops, and remains suspended or fixed in the same place for whole hours, without exhibiting the smallest motion of his wings." There is a little exaggeration here, as is natural for a poet. The speed with which the kite can traverse short spaces must be very great, but it is doubtful whether its direct flight is equal to that of several other of our hawks; and it is stated that the peregrine falcon, and even the sparrow hawk, were formerly employed to pursue this bird, which they easily overtook, and often drove to the ground. The kittiwake, a bird remarkable for its light and apparently rapid flight, is outstripped by the guillemot, the auk, and even the cormorant, birds with heavy bodies and comparatively small wings, although at a plunge or sudden turn, or a glide through the air, these species would make a poor figure beside the gull.

The kite is less daring and energetic than the falcons, a circumstance which of course arises from its organization, although one cannot easily comprehend how a bird so well adapted for predatory adventure should not rival the most ferocious of the aerial pirates. It attacks small quadrupeds and birds, especially young rabbits, hares and partridges, as well as reptiles, and occasionally feeds on carrion, garbage, and insects of various kinds. Like the harriers, hawks, and falcons,

it also seizes on chickens and ducklings that have strayed to some distance. Willughby represents its audacity as such, that, on account of its frequent depredations on poultry, it is held in more hatred by housewives than any other bird; and this no doubt was true enough in his days, but kites are so uncommon now that they can hardly be a terror to the breeders of domestic birds. Although said to be a coward in some respects, it sometimes shews more boldness than prudence. Thus Montagu relates, that one was so intent in obtaining some chickens from a coop, that it was knocked down with a broom by a servant girl; and that, while a poor woman was washing in a stream some entrails, part of which extended a few yards in the water, a kite that had long been hovering over, pounced upon and carried off a part, in spite of the woman's efforts to deter him. A correspondent of Buffon's mentions this propensity as one of the characteristics of the species. Several authors state that it eats dead fish, and a writer in Loudon's useful and entertaining Magazine of Natural History says that he has frequently seen a kite come from the forest at Blois to fish in the Loire, which it seemed to do with much success, seldom appearing to miss its prey. Montagu alleges that it destroys young lambs, and many authors attribute to it a relish for dead animals of various kinds. The kite, therefore, is a foul and promiscuous feeder, like man, and although so elegant a bird might be expected to be more delicate in this matter, we must take him as he is.

The author of the Journal of a Naturalist states, that in his district, which is between Gloucester and

Bristol, the kite is one of the rarest birds. "We see it," he says, "occasionally in its progress to other parts, sailing along sedately on its way; but it never visits us. Our copses present it with no enticing harbourage, and our culture scares it. In former years I was intimately acquainted with this bird; but its numbers seem greatly on the decline, having been destroyed, or driven away to lonely places, or to the most extensive woodlands. In the breeding season it will at times approach near the outskirts of villages, seeking materials for its nest; but in general it avoids the haunts of man. It is the finest native bird that we possess, and all its deportment partakes of a dignity peculiar to itself, well becoming a denizen of the forest or the park; for though we see it sometimes in company with the buzzard, it is never to be mistaken for this clumsy bird, which will escape from the limb of some tree, with a confused and hurried flight, indicative of fear; while the kite moves steadily from the summit of the loftiest oak, the scathed crest of the highest poplar, or the most elevated ash, circles round and round, sedate and calm, and then leaves us. I can confusedly remember a very extraordinary capture of these birds when I was a boy. Roosting one winter evening on some very lofty elms, a fog came on during the night, which froze early in the morning, and fastened the feet of the poor kites so firmly to the boughs, that some adventurous youths brought down, I think, fifteen of them so secured! Singular as the capture was, the assemblage of so large a number was not less so, it being in general a solitary bird, or associating only in pairs."

PROPAGATION.—With us the kite nestles in the inaccessible parts of rocks, or in the forks of large trees. The nest is described as constructed of twigs, and lined with wool, hair, and feathers. I have never met with one, however, but I have examined two eggs reported by a trust-worthy person to have been taken from a kite's nest in Argyllshire, and other two from the continent. Of the former one was bluish-white, the other yellowish-white, clouded with reddish-brown. The latter were white with a few dots of brown. The form is broadly elliptical or roundish, the length varying from two inches and three-twelfths to two inches and one and a half twelfth, the breadth in all the specimens one inch and eight-twelfths. Like other hawks, the kite breeds early in the season, but I am unable to afford any further information on the subject.

YOUNG.—The young, when fully fledged, do not differ very materially from the old. The head and neck are of a deeper tint, the upper parts of a very rich brownish-red, the lower also of a richer tint than those of the adults, and the central dark markings of all the feathers are larger and blacker, those on the back having moreover a fine purple gloss. The bars on the tail are more distinct, the colours of that part much darker, and the lower tail-coverts are as in the old bird. The iris is yellowish-brown, and the bare parts of nearly the same tints as those of the adult.

PROGRESS TOWARDS MATURITY.—The young, after the period of the first moult, differ very little from their parents. The older the bird grows, the more atte-

nuated become the dark central markings of the feathers, and the paler the red of their edges. The female gradually becomes more grey on the head, until that part at length assumes a delicate greyish-white tint. The plumage of her back also is more or less tinged with the same colour, and the red of her breast is not so deep as in the male.

The gradual diminution of the central dark markings of the feathers is common to all the falconine birds with which I am acquainted. In the peregrine falcon they at length almost or entirely disappear, and in the kestrel and merlin the plumage tends to become lighter, and of more uniform tints, the older the birds become.

REMARKS.—According to authors, this species is generally distributed over the continent of Europe, being in France and Italy much more common than with us, in Switzerland and Germany not very rare, in Denmark very frequent, in Holland and Russia less numerous. It has not been observed in America, where its place may be said to be occupied by the Swallow-tailed Kite, *Elanus furcatus*, a bird of a different genus, but allied in its conformation and manners.

I have preferred Brisson's name, *Milvus regalis*, to Dr Fleming's, *Milvus vulgaris*, both because it was first applied, and because it is expressive of a fact connected with the history of the species. According to Buffon, the kite was honoured with the epithet royal, not on account of any thing princely in his character, but because he was considered royal game:—"parce qu'il servoit aux plaisirs des princes qui lui faisoient donner la chasse et livrer combat par le faucon ou l'épervier."

The names by which the kite is known in different parts of the country are, Gled, Glade, Glead, Red Gled, Fork-tailed Gled, Puttock, An Clamhan Godh-lach. Under the names of Kite and Gled, however, are confounded by country people the Common Buzzard, the Kite, the Common Harrier, and the Moor Harrier.

Falco Milvus. *Linn. Syst. Nat.* vol. i. p. 126.

Falco Milvus. *Lath. Ind. Ornith.* vol. i. p. 20. Old.

Falco austriacus. *Lath. Ind. Ornith.* vol. i. p. 21. Young.

Kite. *Mont. Ornith. Dict.*

Milan Royal. Falco Milvus. *Temm. Man. d'Ornith.* p. 59.

Milvus vulgaris. Kite. *Flem. Brit. Anim.* p. 51.

Kite or Glead. Milvus vulgaris. *Selby, Illust.* vol. i. p. 74.

CIRCUS. HARRIER.

BILL short, as broad as deep at the base, attenuated and compressed towards the end: upper mandible with its dorsal line nearly straight and sloping to the edge of the rather broad cere, beyond which it is curved so as to form rather less than the fourth of a circle, the ridge on the cere flattened, beyond it rather narrow but convex, the sides rapidly sloping and a little convex, the sharp edges overlapping, with a distinct festoon or sharp-edged projection beyond the middle, the tip deflected, slightly concave beneath, acute, its lower part nearly perpendicular; lower mandible with the angle medial, broad and rounded, the crura sloping upwards and feathered, the dorsal line convex, the ridge broad, the edges inflected, straight and soft at the base, beyond the middle sharp and slightly arched, the tip obliquely rounded.

Mouth wide; palate flat, with two prominent longitudinal lines, upper mandible concave within and having a lateral groove on each side for the reception of the sharp inflected edges of the lower, which is more deeply concave. The palatal slit defended by acute papillæ, as is the glottis behind. Tongue short, fleshy, concave above, horny beneath on its fore part, rounded

and slightly emarginate at the extremity. Œsophagus wide, and much dilated above the middle; the proventriculus glandular and very wide below; the stomach roundish, compressed, its central tendons small but distinct; the pylorus without valvular prominences, the intestine a little wider at its upper part, after which it is nearly uniform in diameter to the rectum, at the commencement of which are two very small cæca.

Nostrils large, ovato-oblong, in the middle and fore part of the cere, nearer the ridge than the edges, and having an oblique plate from the upper edge. Eyes large; eyelids feathered and edged with bristles. Aperture of the ear very large broadly elliptical.

Head of moderate size, oblong; the body light, as deep as broad anteriorly, much compressed behind; the neck rather short. The legs long and slender; tibiæ long but muscular; tarsi long, compressed, with large oblique scutella on the fore and outer side, oval or sub-hexagonal scales on the sides, and scutella behind, excepting at the upper and lower parts; toes small, slender, the outer with a short web at the base connecting it with the third, first considerably shorter than second, fourth a little longer than the latter, third much longer; all covered above with scutella, unless at the base, where there are small scales, beneath tuberculate and papillate, there being a long fleshy tubercle on the last joint of each toe, and one on the next joint of the two outer; claws long, compressed, rounded above, flat beneath, curved into the fourth of a circle, those of the first and second largest, that of the third with a slight internal edge, of the fourth much smaller and less curved.

Plumage very soft, generally blended, on the back the feathers somewhat distinct. Cere covered on the sides with rather long bristle-tipped feathers, which curve upwards and partially conceal the nostrils; space between the bill and eye with radiating feathers of the same nature. Feathers of the head of moderate length, rounded; of the neck bulky; a distinct ruff of narrow feathers decurved but with the tips recurved extends from behind the eye on each side to the chin; those of the sides and of the outer part of the tibiae much elongated, of the abdomen downy. Wings long, much rounded; primary quills ten, the fourth and third longest, the first about equal to the seventh, the first four cut out on the inner edge towards the end, the second, third, fourth and fifth slightly cut out on the outer; secondary quills thirteen, of moderate length, broad, broadly rounded with a minute acumen, a little oblique when the wing is closed. Tail long, straight, nearly even or rounded, of twelve moderately broad rounded feathers.

The genus *Circus* may in several respects be considered as allied to the genera *Accipiter* and *Buteo*, while it obviously forms a transition from the falconine family to that of the owls. The bill is intermediate in form between that of *Accipiter* and that of *Buteo*; the tarsi resemble those of the former, and the wings those of the latter. The general form, which is slender, approaches to that of *Accipiter*, and the plumage is intermediate between that of the buzzards and owls. To the latter birds the harriers shew a decided affinity in the texture and form of their feathers, especially the

females, which in colour also bear a great resemblance to some species of that family. The slender form of the body, the rounded form of the feathers of the head, the ruff of narrow curved feathers on the fore neck, and the elongated tarsi, are characters which of themselves are sufficient to separate the *Circi* from all other genera of the family, although, like every other group, they exhibit various transitions.

Three species are found in Britain : the Moor Harrier, the Common Harrier, and Montagu's Harrier. They frequent uncultivated heaths, or marshy places, repose on the ground, fly low in circles while searching for food, seldom seize their prey on wing, nestle among the heath or herbage, and never perch on trees. Their food consists of small quadrupeds, partridges, young grouse, small birds, reptiles, fishes, insects, and sometimes carrion.

CIRCUS ÆRUGINOSUS.

THE MOOR HARRIER.

THE adult umber-brown, tinged with grey on the upper parts, deep reddish-brown on the lower; the head, upper parts of the neck, and the shoulders, to a greater or lesser extent, yellowish-white. The young birds deep chocolate-brown, the wing-coverts brownish-red at the end, the quills and tail-feathers terminated with reddish-white. After the second moult, more or less yellowish-white on the head and neck according to age.

MALE.—The Moor Harrier is of a rather slender form, and in its general appearance resembles the ring-tailed; but it differs from that species and Montagu's harrier in having the bill and feet proportionally stronger. It might be considered as a buzzard with nearly as much propriety as a harrier, and is one of those species which shew how arbitrary limitations of genera frequently are. The body is elongated ovate, very narrow behind; the neck short, the head oblong and of moderate size. The bill is shorter than the head, deeper than broad at the base, compressed; the upper mandible has its dorsal line nearly straight, and sloping to the end of the cere, beyond which it is curved in the fourth of a circle; the ridge broad and rather flat to the end of the cere, then broadly convex, the sides sloping, at the base slightly concave, towards the end slightly

convex, the festoon rather prominent, the tip perpendicular at the extremity. The cere is rather large, its margin forming a convex curve before the nostrils, below which it slopes backwards to the angle of the mouth. The lower mandible has the angle short and broad, the dorsal line convex, the back broadly rounded, the sides convex, the edges inflected, the end obliquely rounded.

The eyes are large; the eyelids feathered, and furnished with ciliary bristles; the nostrils ovato-oblong, rather large, having a ridge or plate internally from the upper edge, and placed in the fore part of the cere; the aperture of the ear broadly elliptical and large.

The tarsi, which are feathered anteriorly about a fourth of their length, are slender and compressed, with an anterior row of eighteen scutella, a series of about ten scutella behind, the sides and upper and lower hind parts reticulate. The toes are of moderate length and thickness, the first shortest, the fourth a little longer than the second, the third much longer; they are covered above with scutella, unless towards the base, where there are transverse series of small square scales; the fourth is connected with the third by a basal web. The claws are long, very acute, curved in about the fifth of a circle, flat beneath, that of the third toe with an inner sharp edge, the first and second largest. On the first toe are five, on the second four, on the third fifteen, on the fourth ten, scutella.

The plumage is soft, rather compact on the back, slightly glossed, the feathers broad and rounded, those of the abdomen and outer side of the tibiae loose. There is a very indistinct ruff, composed of narrow, slightly

curved feathers. The loreal and ceral bristles are long, especially the latter. The wings are long and much rounded; the primary quills strong, tapering, but rounded, the outer four cut out on both edges; the fourth longest, the third almost equal, the second a little shorter, the first and sixth about equal; the secondary thirteen, straight, broad, and rounded. The tail is long, of moderate breadth, nearly straight, slightly rounded, the feathers rather broad and rounded.

The bill is brownish-black, its basal part tinged with yellow, as is the edge of the festoon; the cere greenish-yellow. The irides are orange; the feet deep yellow; the claws brownish-black.

The general colour of the upper parts is umber-brown, the terminal margins of the feathers paler; of the lower parts deep reddish-brown. The upper part of the head and of the hind neck is brownish-white, the shafts of the frontal and occipital feathers brown; there is also a broad patch of the same colour on the throat. The ciliary and loreal bristles are black. The smaller wing-coverts are paler, their extremities brownish-white; some of the feathers on the fore part of the back also have yellowish edges, and a few of the scapulars have a broad yellow line down the middle of the outer web. The primary quills are blackish-brown, the secondary paler, all slightly margined with brownish-grey. The tail is light brown, the lateral feathers irregularly marked on their inner webs with brownish-red, their tips brownish-white.

Length to end of tail 21 inches, to end of wings 20; extent of wings 50; wing from flexure $16\frac{1}{2}$; tail 10; bill along the back $1\frac{5}{8}$, along the edge of lower man-

dible $1\frac{4}{12}$; tarsus $3\frac{5}{12}$; first toe $1\frac{0}{2}$, its claw 1; second toe 1, its claw $1\frac{2}{12}$; third toe $1\frac{5}{4}$, its claw 1; fourth toe $1\frac{0}{12}$, its claw $\frac{0}{1}$.

FEMALE.—The female is considerably larger, but resembles the male in colour. An individual selected for description was as follows: the bill brownish-black, its basal part tinged with yellow, as is the edge of the festoon; the cere greenish-yellow; the irides reddish-yellow; the feet yellow, the claws brownish-black. The general colour of the upper parts is umber-brown, the terminal edges of the feathers paler; that of the lower parts is of a darker tint, more tinged with red and approaching to chocolate-brown. The upper part of the head and of the hind neck, the anterior part of the loreal space, and the throat to a considerable extent, are yellowish-white, the shafts of the feathers brown. The ciliary and loreal bristles are black; the posterior part of the lore, a narrow space below the eye, and the ear-coverts, brown. The middle of the hind neck, some markings on the fore part of the back, a large patch on the proximal smaller wing-coverts, partially concealed by the scapulars, and many of the feathers on the lower part of the fore neck and anterior part of the breast are also yellowish-white, the shafts, or a lanceolate central spot, being brown. The primary quills are blackish-brown, glossed with purple, their inner webs at the base paler, and slightly dotted with brown; the secondary quills are lighter, and all are slightly margined with pale brownish-grey. The feathers of the rump are tipped with brownish-red; the tail is light brown, tinged with grey, the lateral feathers on the inner webs

variegated with brownish-red, and the tips of all reddish-white. The downy parts and bases of the feathers in general are grey, but of those on the hind neck and on the yellowish-white parts, they are pure white. In this individual the scutella of the tarsus were eighteen, of the first toe six, of the second six, of the third seventeen, of the fourth twelve.

Length to end of tail 24 inches, to end of wings 23; extent of wings 52; wing from flexure $16\frac{3}{4}$; tail $9\frac{3}{4}$; bill along the back $1\frac{5}{8}$, along the edge of the lower mandible $1\frac{5}{8}$; tarsus $3\frac{1}{2}$; first toe $\frac{1}{2}$, its claw $1\frac{1}{2}$; second toe 1, its claw $1\frac{1}{2}$; third toe $1\frac{1}{2}$, its claw $\frac{1}{2}$; fourth toe $1\frac{1}{2}$, its claw $\frac{1}{2}$.

VARIATIONS.—Individuals differ considerably in colour, but chiefly in the extent of the yellowish-white of the head and neck. Sometimes the crown of the head and the throat only are of that colour, with indications of the same on the hind neck and shoulders. Independently of the colouring, the old birds may be distinguished from the young, by the greater size of the bill, toes, and claws. M. Temminck states that he has traced the variations of colour on individuals kept for the purpose. I therefore adopt his views on the subject, considering the oldest birds to be those which have most white. My descriptions, however, are all taken from birds, not borrowed.

HABITS.—Not having had opportunities of studying the habits of this bird, I am obliged to have recourse to the observations of others. The authors of recent date, whose accuracy I have found to be highest, are,

Montagu, M. Temminck, and Mr Selby. The first of these inform us, that the moor harrier appears to be local, mostly frequenting swampy moors and barren situations, and though rarely met with in the cultivated parts, is the most common species of its family about the sandy flats on the coast of Caermarthenshire, where it preys on young rabbits. He states, that he has seen no less than nine feeding at one time upon the carcass of a sheep. It also, he says, feeds on frogs, lizards, worms, and even the larger insects; but is by no means a bird of rapid flight, and therefore pounces its prey on the ground, for which purpose it is generally seen skimming along like the common harrier. M. Temminck states, that it resides in the neighbourhood of marshes, rivers, and lakes, is very abundant in Holland, but rare in Switzerland and the south of Europe, migrates in autumn, and feeds on water-fowl, frogs, mice, slugs, and sometimes fish. Mr Selby's account of its manners is similar.

Moor buzzards frequent the extensive rabbit links or downs of Gulan in East Lothian, and are occasionally captured in traps set by the warren keepers. A full grown specimen of a hen bird, in fine plumage, having been caught by one leg, was preserved alive by Mr Yule of Luffness Mill, and sent to Edinburgh to Dr Neill. The leg had been broken, but, having been bandaged, was soon completely healed. The bird continued a good many months in confinement, and was in a great measure tamed, approaching and snatching meat from the hand; when, having been allowed a considerable degree of liberty, it made off, and after being observed in the neighbourhood for a day or two, finally

disappeared, having probably gone in quest of its old haunts. For this paragraph I am indebted to Dr Neill.

PROPAGATION.—According to Montagu, the nest is frequently made on the ground, amongst short wood, furze, or fern, sometimes, though rarely, in the fork of a large tree, and is composed of sticks, rushes, or coarse grass. The eggs, he says, are perfectly white, without any spots, considerably less than those of the common buzzard. Two specimens which I have seen were white, with a few faint light brown marks; one two inches long, one inch and five-twelfths broad; the other one inch and ten-twelfths long, one and five and a half twelfths broad. Montagu states, that “in the breeding season, when the female is sitting, the male will soar to a considerable height, and remain suspended on wing for a great length of time;” and Mr Selby informs us, that “during the season of incubation, the males will soar to a considerable height, and remain suspended in the air for a long interval of time.”

YOUNG.—The young, when fully fledged, are of a uniform dark chocolate-brown, the feathers of the upper parts slightly tipped with reddish-brown; the larger wing-coverts and alula largely tipped with pale brown; the upper tail coverts of a redder tint than the rest; the quills nearly of the general colour. The cere is greenish-yellow, the bill yellow at the base, brownish-black towards the end, the iris deep brown.

PROGRESS TOWARD MATURITY.—After the first moult the colours remain nearly the same, the general tint

being chocolate-brown; the quills, however, are darker, and the upper part of the head with the occiput is light brownish-red. Sometimes a portion only of the head is of that colour, commonly the fore part and sides, but I have seen the occiput alone so coloured, while the upper part of the head remained brown. At this period there is no patch of light colour on the wings, but the smaller wing-coverts are tipped with light red; the tail is uniform, both webs being alike, its tip light red. The bases of the feathers on the occiput and upper part of the hind neck are white, but of all the other feathers grey. As the bird becomes older, the brown of the upper parts assumes a lighter tint; the tail is tinged with grey, its inner webs are lighter, and variegated or mottled; the primary quills are darker, and their inner webs at the base lighter; the lower surface of the wings also becomes paler, as well as that of the tail. The festoon of the bill is more distinct in old individuals, the bill itself larger, and especially higher, the toes and claws stonger.

REMARKS.—The moor harrier, as I have already observed, is almost a buzzard, and might pass for such without impropriety. Still its form is more slender than that of the birds of the genus *Buteo* generally, and the ruff, although inconspicuous, is regularly formed. The bill is much stronger and deeper than in the two next species. I must confess that the various changes which this species undergoes are not clearly established, although it is evident, on comparing specimens, that the *Falco rufus* and the *Falco æruginosus* of authors are the same bird. I have seen an indivi-

dual which, having a remarkably large bill, and strong feet, must have been old, and which yet was of a nearly uniform chocolate-brown all over, except a patch of brownish-white on the occiput. Temminck, in his *Manual*, gives the same description for the males and the females; and yet, in the third part of the same work, recently published, affirms that the old female differs much from the old male, but without explaining in what respects. He observes, however, that the male, in the intermediate state, has six or seven more or less distinct bands on the tail-feathers, at first red, and afterwards grey, which in the old bird are entirely effaced. However this may be, the species in every state is easily recognised.

I have preferred the specific name *ærginosus*, given by Linnæus to this bird, to that of *rufus*, applied by Gmelin, Latham, and others, to the same species in a different state of plumage, while they also admitted the species, as established by their master. Moor Buzzard, Moor or Marsh Harrier, Harpy, Duck Hawk, and Kite, are all names used for this bird.

Falco ærginosus. *Linn. Syst. Nat.* vol. i. p. 130.

Falco ærginosus. *Lath. Ind. Ornith.* vol. i. p. 25.

Falco rufus. *Lath. Ind. Ornith.* vol. i. p. 25.

Moor Buzzard. *Mont. Ornith. Dict.*

Busard Harpaye, ou de Marais. *Falco rufus.* *Temm. Man. d'Ornith.* part i. p. 69.

Buteo ærginosus. Moor Buzzard. *Flem. Brit. Anim.* p. 55.

Marsh Harrier. *Circus rufus.* *Selby, Illustr.* vol. i. p. 66.

CIRCUS CYANEUS.

THE COMMON OR RING-TAILED HARRIER.

THE tail extending about two inches beyond the wings, of which the third and fourth quills are almost equal. The male light bluish-grey. The female umber-brown above, pale reddish-yellow with brown longitudinal streaks beneath. The young similar to the female, but with richer tints.

MALE.—The Common Harrier, or Hen-harrier, as it is usually named, is of a slender and not inelegant form, its body being light in comparison with the extent of wing; the head of moderate size; the bill comparatively slender; the neck appearing thick, on account of the quantity of soft plumage; the wings and tail long; the feet slender; the toes small and rather short. The bill is weaker than that of any bird of the family that has yet been described in this volume; its dorsal line slopes to the curvature, and its point descends obliquely.

The upper mandible at the point is flat within, the lower deeply concave, with a slight central prominent line. On the palate are three parallel soft ridges. The palatal slit is edged with acute papillæ, and behind the aperture of the glottis is a pad of numerous strong papillæ. The tongue is fleshy, sagittate at the base, concave above, horny beneath on its free part, the tip rounded and slightly emarginate. The œsophagus, which, as usual, lies on the right side of the trachea,

is wide, thin, dilated anteriorly to the furcula into a pouch an inch and a half long, with a diameter of one inch, its whole length being five inches. At its lower part it is thickened, glandular, and extremely dilated, that portion being directly continuous with the stomach. The latter organ is roundish, somewhat compressed, an inch and five-eighths in diameter; its tendons three-eighths in diameter; its muscular coat extremely thin, the inner very soft and without rugæ. The intestine, which is twenty-eight inches long, has a diameter of a quarter of an inch at its upper part, but gradually contracts, until at the cæca it is only one-eighth across. The cæca are extremely small, being only two-twelfths long, obtuse, adherent, and placed at the distance of two inches from the anus. The pylorus is very narrow, but is destitute of the knob-like valves observed in that of the falcons. The liver is of two nearly equal obtuse-edged lobes, and there is no distinct gall-bladder.

The eyes are large; both eyelids feathered and furnished with ciliary bristles, so that the projection of the lachrymal bone is not so obvious as in the falcons; the nostrils large, ovato-oblong; the aperture of the ear broadly elliptical and large.

The tarsi, which are anteriorly feathered about a third down, are rather long and slender, and have anteriorly a series of eighteen rather oblique scutella, of which the lower are smaller, the sides and hind part above reticulated with large hexagonal scales, the middle of the back having about twelve scutella, the lower part small oblong scales. The toes are rather slender, of moderate length, the first with six, the second with

five, the third with eighteen, the fourth with seven scutella, besides transverse series of small scales at the base.

The plumage is as described in the generic character. The wings are long, their tips about two inches shorter than that of the tail; the fourth primary longest, the third almost equal, the fifth a little longer than the second, the first about the length of the seventh; the primaries are very slightly curved, broad, tapering towards the end, and rounded; the secondaries broad and rounded. The tail is straight, long, of moderate breadth, and slightly rounded. The quills and tail-feathers, especially on their inner webs, are extremely soft, being covered with a velvety down, as in those of owls.

The bill is bluish-black, the cere yellow; the inside of the mouth dark bluish-grey. The irides are yellow. The tarsi and toes are orange-yellow, the claws black. The general colour of the plumage above is light greyish-blue, the head and scapulars of a deeper tint, the hind part of the back paler; the bases of the occipital and ruff feathers white; the bristles of the cere and lores black, their downy bases white. The fore neck and anterior part of the breast are also greyish-blue, but paler; the middle of the breast, the abdomen, and the legs, bluish-white; the lower wing-coverts, and the lower and upper tail-coverts, pure white. The six outer primaries are brownish-black, at the base white, and on the outer web tinged with grey; the rest, and the secondaries, of the general colour on their outer webs, white on their inner, and obscurely barred with dark grey. The two middle tail-feathers are of a

lighter tint than the back, and the colour on the outer webs of the rest gradually fades into white on the lateral feathers; the inner webs of all but the two middle white; there are eight irregular and indistinct bars of a darker grey, and the tips are white.

Length to end of tail 18 inches, to end of wings $15\frac{1}{2}$; extent of wings 40; wing from flexure $13\frac{1}{2}$; tail 9; bill along the ridge $1\frac{1}{2}$, along the edge of lower mandible 1; tarsus $2\frac{1}{2}$; first toe $1\frac{8}{12}$, its claw $1\frac{0}{12}$; second toe $1\frac{0}{12}$, its claw $1\frac{11}{12}$; third toe $1\frac{6}{12}$, its claw $1\frac{8}{12}$; fourth toe $1\frac{1}{12}$, its claw $1\frac{7}{12}$.

FEMALE.—The female, which is much larger than the male, differs so much in external appearance, that she was long considered as of a distinct species. The proportions are similar, but the plumage is considerably softer, the ruff is more distinct, and the feathers on the neck are much more bulky.

The colours of the bare parts are as in the male, but the iris is yellowish-brown. The general colour of the upper parts is umber-brown, of the lower light yellowish, with oblong brown longitudinal markings. The upper part of the head is deep brown, the feathers slightly edged with light yellowish-red; the anterior part of the forehead, a band over the eye, and the loreal space, pale greyish-yellow, the bristle-tips of the latter black. The cheek-feathers are dull brown, edged with yellowish-red; the ruff-feathers light yellowish-red, with a narrow brown central band. The upper hind part, sides and fore part of the neck, the breast and sides, are light reddish-yellow, each feather with an oblong-lanceolate umber-brown mark. Some of the

hypochondrial feathers have four light spots, as in the female merlin; the central part of the outer tibial feathers is light brownish-red, as is the case with the abdominal feathers and lower tail-coverts. On the scapulars are obscure transverse bands, and some of them, as well as many of the wing-coverts, have one or two round whitish concealed spots; the bases of the occipital feathers also are white. The primary and secondary quills are of the same colour as the back, slightly edged with paler, the greater part of their inner webs whitish, the primaries with broad bands of deeper brown. Upper tail-coverts white, with a few irregular brown markings. Tail light greyish-brown, white at the base, with six waved bands of deep brown on the middle, four on the lateral feathers, the last band much larger, the tips brownish-white, the inner webs, excepting of the two middle feathers, pale reddish-grey, the shafts pale brown. Lower wing-coverts brown in the centre, with whitish margins; lower surface of primary quills greyish-white, with very conspicuous broad blackish-brown bands; the tail paler beneath, with the bands more distinct.

Length to end of tail 21 inches, to end of wings 19; extent of wings 46; wing from flexure $15\frac{1}{4}$; tail 10; bill along the ridge $1\frac{5}{12}$, along the edge of lower mandible $1\frac{2}{12}$; tarsus $2\frac{3}{4}$; hind toe $\frac{3}{4}$, its claw $1\frac{1}{2}$; second toe $1\frac{1}{2}$, its claw $1\frac{1}{12}$; third toe $1\frac{5}{12}$, its claw $1\frac{1}{2}$; fourth toe $1\frac{1}{12}$, its claw $\frac{3}{4}$.

VARIATIONS.—Adult males vary a little in size, as do the females. The younger the former are, the less pure is the greyish-blue of their upper parts, it being

more or less tinged with brown, and the more distinct are the bands on the tail. In very old individuals, the lower parts are pure white, the tail greyish-white, excepting the two middle feathers, and its bars obsolete. The females vary a little in their markings, some having the whitish spots on the wing-coverts and scapulars more distinct. The older the individual the lighter are its brown colours, and the tail is more tinged with grey. The feathers in both sexes become more or less ragged and acuminate by rubbing, and the tints much paler, towards the period of the moult.

HABITS.—Should we, on a fine summer day, betake us to the outfields bordering an extensive moor, on the sides of the Pentland, the Ochill, or the Peebles Hills, we might chance to see the harrier, although hawks have been so much persecuted that one may sometimes travel a whole day without meeting so much as a kestrel. But we are now wandering amid thickets of furze and broom, where the blue milkwort, the purple pinguicula, the yellow violet, the spotted orchis, and all the other plants that render the desert so delightful to the strolling botanist, peep forth in modest beauty from their beds of green moss. The golden plover, stationed on the little knoll, on which he has just alighted, gives out his shrill note of anxiety, for he has come, not to welcome us to his retreats, but if possible to prevent us from approaching them, or at least to decoy us from his brood; the lapwing, on broad and dusky wing, hovers and plunges over head, chiding us with its querulous cry; the whinchat flits from bush to bush, warbles its little song from the top-spray, or sal-

lies forth to seize a heedless fly whizzing joyously along in the bright sunshine. As we cross the sedgy bog, the snipe starts with loud scream from among our feet, while on the opposite bank the gor cock raises his scarlet-fringed head above the heath, and cackles his loud notes of anger or alarm, as his mate crouches amid the brown herbage.

But see, a pair of searchers not less observant than ourselves have appeared over the slope of the bare hill. They wheel in narrow curves at the height of a few yards; round and round they fly, their eyes no doubt keenly bent on the ground beneath. One of them, the pale blue bird, is now stationary, hovering on almost motionless wing; down he shoots like a stone; he has clutched his prey, a young lapwing perhaps, and off he flies with it to a bit of smooth ground, where he will devour it in haste. Meanwhile his companion, who is larger, and of a brown colour, continues her search; she moves along with gentle flappings, sails for a short space, and judging the place over which she has arrived not unlikely to yield something that may satisfy her craving appetite, she flies slowly over it, now contracting her circles, now extending them, and now for a few moments hovering as if fixed in the air. At length, finding nothing, she shoots away, and hies to another field; but she has not proceeded far when she spies a frog by the edge of a small pool, and, instantly descending, thrusts her sharp talons through its sides. It is soon devoured, and in the mean time the male comes up. Again they fly off together; and were you to watch their progress, you would see them traverse a large space of ground, wheeling, gliding, and flapping,

in the same manner, until at length, having obtained a supply of savoury food for their young, they would fly off with it.

The direct flight of the common harrier is rapid, and is performed by constant beats, its neck and legs retracted, and its tail slightly spread. It sails at intervals as it proceeds, and searches the ground or the bushes in short circles with great assiduity. Its prey consists of young birds of various kinds, of grouse and partridges, small birds, especially larks, young hares and rabbits, mice, frogs, lizards, and serpents. It also occasionally eats dead fish, and now and then ventures into the neighbourhood of the farm-house, and carries off a chicken or a duckling. In fact, its occasional depredations have caused it to be named the hen-harrier, although, as it does not carry off hens, it might with more propriety have been named the chicken-harrier. It sometimes perches on a stone, or the top of a knoll, where it stands nearly erect, which is also its ordinary attitude of repose. It does not confine its excursions to the moors or the fields bordering them, but explores the cultivated grounds, and sweeps along the hedges, where it procures small birds, partridges, and mice. In general, it does not pursue its prey in open flight like the falcons, but seizes it on the ground, and in searching for it occasionally hovers in the manner of the kestrel. In flying over cultivated lands, intersected by walls and hedges, it generally proceeds at a greater height than when over open uncultivated ground. If those persons who imagine that birds of prey can perceive the objects of their pursuit at those immense distances alleged, were to study the manners of the hen-harrier,

kestrel, and sparrow hawk, they would find reason to suspect that they had been deceived by the fanciful descriptions of men whose sources of information are on their book-shelves. The hen-harrier, in fact, might be said to be a very near-sighted bird; the height at which the kestrel hovers does not generally exceed forty feet; the sparrow hawk flies at an elevation of from ten to twenty or thirty feet; and even the golden eagle, as I have often observed, seeks for *live* prey at a small height over the surface, although it can perceive a carcass, or the ravens that are hastening towards one, from a great distance.

Nor is it true that the common harrier *never* seizes its prey in open flight. Two young friends of mine, while collecting insects on the Pentland Hills in the summer of 1835, saw two of these birds flying low over the heath, evidently in search of prey, when a red grouse rose and flew off, but was overtaken by one of the hawks, who drove it to the ground, and alighted to devour it, in which it was joined by the other. Mr Martin, gamekeeper to the Earl of Lauderdale, shot a male of this species in the end of September of the same year, as it flew past him carrying a red grouse, which he found to have been torn on the head. This circumstance brings to my mind another error common to most of the fireside philosophers, as well as to some of the peripatetics, who allege that the true falcons, in devouring their prey, always begin with the head, whereas the "baser sort" commence their repast by tearing up any part that comes first in their way. The peregrine falcon, who is among the noblest of the noble, is not so nice or discriminate, but generally prefers a

tug at the pectoral muscle to a fruitless dab into the brain of his victim.

Mr Slaney, in his very pleasing little work, entitled "An Outline of the smaller British Birds," states, that the common harriers "are very destructive to game. In shooting, the writer has seen the hen harrier dart at a partridge which his dogs put up, and carry it off. By following the marauder some distance he got the partridge, which was quite dead, with a very slight mark on the head. Another day he shot the ring-tail, and on examining the spot where the hawk got up, found a partridge half devoured. This had been killed, as appeared by the feathers, at a little distance, but carried to the edge of a splash of water, where the plunderer had an opportunity of washing his beak and claws between every mouthful, and eating his quarry like a gentleman!—or rather, in this case, a lady."

Sir William Jardine, however, states, that "they never take their prey on the wing; but when pursuing it, make a slight dash, and follow it to the place chosen for refuge." "I once shot," he continues, "an old female which had driven a covey of partridges into a thick hedge, and was so intent upon watching her prey, that she allowed me to approach openly from a distance of nearly half a mile. They are often met with about the sea-coast; and I have seen one repeatedly come to the stake-nets on the Solway Firth, and eat the dead fish that were left there. In hunting, they pursue a regular beat or track for many days together. I have repeatedly watched a bird for miles, day after day, follow nearly the same line, only diverging on the appearance of prey; and so nearly at one time do they pass

the different ranges of their course, that I have placed myself in cover about the time they were expected, often with success; if they returned at all, they were never more than a quarter of an hour of variance from their usual time."

Edwards, in his *Gleanings of Natural History*, gives the following account of a male bird, which he has figured and described under the name of "the Blue Hawk." "When first seen, it was dodging round the lower parts of some old trees, and sometimes seemed to strike against the trunks of the trees with its beak or talons, still continuing on the wing, the cause of which could not be guessed till after it was killed; when, on opening the bird, near twenty of the above-described lizards were found in its craw, which it had artfully circumvented, by suddenly coming round upon them."

The hen harrier is more frequently seen in Scotland and in England, than most of the larger species of the family, and, next to the sparrow hawk, the kestrel, and the merlin, may, I believe, be considered as our most common bird of prey. It is stationary in the country, although it shifts its quarters in some measure, frequenting the lower or cultivated grounds in autumn and winter, and betaking itself to the higher or pasture-lands in summer.

PROPAGATION.—At the commencement of the breeding season the harriers may sometimes be seen chasing each other on wing. On these occasions they utter a loud clear cry, which resembles that of the kestrel. They also occasionally soar to a considerable height, where they sail in circles, like several other species of

the family. The nest, which is composed of sticks, with some dry grass, or of the latter solely, is placed at the foot of a furze bush, or among heath, or sometimes on broken craggy ground. Sir William Jardine, in his edition of Wilson's American Ornithology (vol. iii. p. 392), has appended a note to the description of this species, part of which I here transcribe, as forming a valuable addition to its history. "In a country possessing a considerable proportion of plain and mountain, where I have had the greatest opportunities of attending to them, they always retire, at the commencement of the breeding season, to the wildest hills, and during this time not one individual will be found in the low country. For several days previous to commencing their nest, the male and female are seen soaring about, as if in search of, or examining, a proper situation, are very noisy, and toy and cuff each other in the air. When the place is fixed, and the nest completed, the female is left alone; and when hatching, will not suffer the male to visit the nest, but on his approach rises and drives him with screams to a distance! The nest is made very frequently in a heath bush by the edge of some ravine, and is composed of sticks, with a very slender lining. It is sometimes also formed on one of those places called *scars*, or where there has been a rut on the side of a steep hill after a mountain thunder-shower; here little or no nest is made, and the eggs are merely laid on the bare earth, which has been scraped hollow. In a flat or level country, some common is generally chosen, and the nest is found in a whin or other scrubby bush, sometimes a little way from the ground, as has been re-

marked in the description of the American birds. The young are well supplied with food, I believe by both parents, though I have only seen the female in attendance; and I have found in and near the nest the common small lizard, stone-chats, and young grouse.

“ When the young are perfectly grown, they, with the old birds, leave the high country, and return to their old haunts, hunting with regularity the fields of grain, and now commit great havock among the young game. At night they seem to have general roosting places, either among whins or long heath, and always on some open spot of ground. On a moor of considerable extent I have seen seven in the space of one acre. They began to approach the sleeping ground about sunset; and, before going to roost, hunted the whole moor, crossing each other, often three, or four in view at a time, gliding along in the same manner as that described by Dr Richardson of the *C. americanus*. Half an hour may be spent in this way. When they approach the roost they skim three or four times over it, to see that there is no interruption, and then at once drop into the spot. These places are easily found in the day; and the birds may be caught by placing a common rat-trap, or they may be shot in a moonlight night. In both ways I have procured many specimens.”

The eggs vary from three to five, and are of a broadly elliptical form, one inch and nine-twelfths long, one and five-twelfths broad, and of a bluish-white colour, sometimes faintly dotted with brown.

YOUNG FLEDGED.—The young, which are at first covered with white down, are, when fully fledged, as fol-

lows. The bill is blackish-brown, the bases of both mandibles yellow, the iris dark brown, the feet yellow, the claws blackish-brown. The colouring of both sexes is similar in character to that of the adult female. The upper parts of the head and hind neck are deep brown, the feathers edged with light brownish-red; the cheeks are of a similar colour, as are the ruff-feathers, which, however, are paler on the edges. The space anterior to the eye is dusky, a broad band of whitish extends over it from the bill, and there is another over the lower eyelid. The upper parts in general are rich umber-brown, the concealed spots and bands on the scapulars, and a large portion of the edges of the smaller wing-coverts, especially those along the humeral margin, brownish-red; the primary and secondary quills are slightly edged with brownish-grey, the dark bands on the quills less apparent than in old females, excepting on the inner webs; the tail is marked with four broad bands of brownish-black, and an equal number of pale red, the terminal band of the latter colour fading into white; the red bands are brighter on the lateral feathers, and on the central are obscured with brown. The lower parts are light brownish-red, deeper anteriorly, all the feathers having a central band of brown, darker on the neck, and gradually fading and becoming narrower behind. The upper tail-coverts are white, with a central lanceolate brown spot. At this age the males may be distinguished from the females by their smaller size, and by having the colours considerably lighter.

PROGRESS TOWARDS MATURITY.—The male, after

the first autumnal moult, acquires in a considerable measure the plumage of the adult. Montagu, who first ascertained by actual observation the change which it undergoes, thus describes one which he had reared from the nest, and which he killed in the middle of October for the purpose of preserving it. "In this state the plumage of the ring-tail, or female, still remains about the neck, the smaller coverts of the wings, the thighs and part of the belly, intermixed with the male plumage: the top of the head and wreath have also a mixture of the feathers of both sexes: the quills, scapulars, and tail, are completely masculine; in the last of these are a few small broken bars of cinereous brown, on a white ground, in the three outer feathers the exterior margin cinereous grey; the six middle feathers are almost wholly grey, and the markings are very obscure beneath." From the account here given of the hen harrier, it is quite clear that the change of plumage is effected in the autumn of the year after it leaves the nest, and not in the same year.

I have the skin of a male, shot in October of the present year, which, with the plumage of the adult, retains a few of the brown feathers on the head, ruff, and wings. The new scapulars are dark greyish-brown, as are the extremities of the inner secondaries. The tail is faintly barred, but the bars on the inner webs of the wings have disappeared.

The females, as they advance in age, acquire a greyish tinge on their dark brown parts, while the light red changes to light greyish-yellow; the bars of the wings become more apparent, because their intervals assume a lighter tint, but they also become narrower,

as do those of the tail, the terminal dark bar of a young female now before me being an inch and ten-twelfths in breadth, while that of an old female is only an inch and a quarter.

REMARKS.—This species appears from the statements of authors to be generally distributed over the continent of Europe. According to Temminck, it is rare in Switzerland and other mountainous regions, but is more common in Holland than the next species, which on the contrary is very rare with us. It would even appear that it occurs on all the continents, as well as in New Holland; but, on account of the numerous gradations in the colours of the plumage, the question of the identity of the species as observed in different countries remains undecided.

Having obtained another fresh female of this species since the preceding pages were composed, I consider it not inexpedient to add here the following particulars respecting it.

Length to end of tail 21 inches, to end of wings $18\frac{1}{2}$; extent of wings 46; wing from flexure 15; tail 10; bill along the ridge $1\frac{4}{8}$, along the edge of lower mandible $1\frac{4}{8}$, cere $\frac{5}{8}$; tarsus 3; first toe $\frac{3}{4}$, its claw $1\frac{1}{8}$; second toe $\frac{1}{2}$, its claw $1\frac{1}{8}$; third toe $1\frac{1}{2}$, its claw $\frac{1}{2}$; fourth toe $\frac{11}{16}$, its claw $\frac{9}{16}$.

Aperture of posterior nares elliptical, anteriorly linear. Tongue oblong, the sides nearly parallel, the tip truncato-retuse and rounded, its upper surface with a central deep groove, its extremity horny beneath. Width of mouth one inch and one-twelfth. The œsophagus five inches long, at its commencement ten-twelfths

in diameter. It almost immediately dilates into a very large sac, three inches and a quarter long behind, two inches and ten-twelfths deep, and two inches and a quarter in breadth. This part is extremely thin, furnished with scarcely apparent muscular fibres, and totally destitute of glandules. At its entrance into the thorax it contracts to one inch. The proventriculus is completely surrounded with glandules, and expands to join the stomach. That organ is oval, somewhat compressed, two inches long, its tendons five-twelfths in diameter. The intestine is thirty-five inches in length, and at its upper part has a diameter of four-twelfths, which gradually contracts to little more than one-twelfth. The cloaca is an inch and a half in diameter; the large intestine varies from half an inch to a quarter; and the cœca are merely two oblong bodies one-twelfth of an inch in length.

The tarsus had fifteen anterior scutella, the first toe six, the second six, the third sixteen, the fourth seven.

In the crop was a considerable quantity of flesh and feathers undigested, and the stomach was filled with the same. On washing and drying some of the feathers I found them to be those of a ptarmigan. This confirms Mr Martin's statement, and that of my young friends mentioned above, and proves that the hen-harrier is not so spiritless and feeble a bird as some persons would have us believe it to be.

The male was formerly named the Hen Harrier, while the female, which was considered as a distinct species, bore the name of Ring-tail. Country people name it Blue Kite, Blue Hawk, Ring-tail, Brown Kite, or Gled; and the Highlanders call it Braid-air-

toin (rag-on-rump), on account of the white tail-coverts conspicuous in both sexes.

Falco cyaneus. *Linn. Syst. Nat.* vol. i. p. 126. Male.

Falco pygargus. *Linn. Syst. Nat.* vol. i. p. 126. Female.

Falco cyaneus. *Lath. Ind. Ornith.* vol. ii. p. 39. Male and Female.

Falco cyaneus. *Mont. Trans. Linn. Soc.* vol. ix. p. 182.

Busard Saint-Martin. Falco cyaneus. *Temm. Man. d'Ornith.* p. 72.

Circus cyaneus. Hen Harrier. *Flem. Brit. Anim.* p. 53.

Hen Harrier. Circus cyaneus. *Selby, Illust.* vol. i. p. 68.

CIRCUS CINERACEUS.

MONTAGU'S OR ASH-COLOURED HARRIER.

THE ruff obscure; the wings extending a little beyond the tail; the third quill much longer than the fourth and second. The female umber brown above; pale reddish-yellow, with longitudinal bright red streaks, beneath. The young similar to the female, but with the lower parts of a uniform bright red.

MALE.—This species, which was first distinguished from the common harrier, and accurately described, by Montagu, is remarkable for its slender form and the great length of its wings. The head is rather small; the bill more slender than in any other British species of the family; the feet slender, and the toes small and rather short. The dorsal outline of the bill slopes towards the curve of the point, but is somewhat convex on the cere; the sides of the upper mandible are sloping at the base, towards the end very slightly convex, the tip slender and very acute.

The tarsi, which are anteriorly feathered about a fourth down, are long and slender, and are covered anteriorly with a series of eighteen scutella, of which the lower are smaller; the toes are small, the first with eight, the second with ten, the third with eighteen, the fourth with fourteen, scutella.

The plumage agrees with that of the common har-

rier, but the cervical ruff is very indistinct. The wings are very long, and extend a little beyond the tail; the third primary is longest, and exceeds the second and third by nearly an inch, the first is a little longer than the fifth; the primaries are straight, tapering, and rounded; the secondaries short, broad, obliquely rounded, and slightly emarginate.

The bill is black, the cere greenish-yellow; the iris yellow, as are the feet; the claws black. The general colour of the plumage above is light greyish-blue, the scapulars tinged with brown; the bases of the occipital feathers white; the bristles of the cere and lores black, their downy bases white. There are two transverse brownish-black bands on the secondary quills, but only one of them appears when the wings are closed; the seven outer primaries are more or less black, the outer entirely so, the seventh only tinged with that colour on the outer web; their tips grey. The tail has four broad bands of dark grey, changing to brownish-red on the outer webs. The fore neck and anterior part of the breast is bluish-grey like the back; the rest of the breast, the sides, and the lower tail-coverts, are white, each feather with a longitudinal central bright red mark; the smaller lower wing-coverts similar.

Length to end of tail 17 inches, to end of wings $17\frac{1}{2}$; wing from flexure 15; tail $9\frac{1}{2}$; bill along the ridge 1; tarsus $2\frac{2}{12}$; first toe $\frac{1}{2}$, its claw $\frac{8}{12}$; second toe $\frac{7}{12}$, its claw $\frac{9}{12}$; third toe $1\frac{2}{12}$, its claw $\frac{7}{12}$; fourth toe 1, its claw $\frac{5}{12}$.

The above description is from a specimen in the Museum of the University of Edinburgh. The following is that taken by Montagu from a specimen killed

in Devonshire, in August 1803, altered in arrangement. Bill black, the base and cere greenish; irides and edges of eyelids bright yellow; feet orange-yellow; claws black. The head, the neck all round, the back and scapulars, cinereous brown, the latter cinereous at their base, with the tips brown; the smaller wing-coverts like the scapulars, the larger also cinereous brown; the first eight primaries dusky black, the last with a dash of cinereous; secondary quills cinereous brown above, pale beneath, with three remarkable dusky bars, transversely placed, and nearly in parallel lines, each half an inch in breadth, one only, however, being visible on the upper side of the wing, and about two inches from the tips. The first row of under wing-coverts is white, with a large dusky bar across the middle; the rest are bright bay, more or less spotted, barred, or margined with white. The lower parts, including the tail-coverts and thighs, are white, with a broad streak of bright bay down the shaft of each feather; the axillar feathers with broad alternate bars of bay and white. The tail is slightly cuneate, the two middle feathers dusky brown, the rest dark ash-colour, palest on the two or three outer feathers, which have their inner webs approaching to white; all, except the two middle feathers, have five equidistant bars on the inner webs, taking in the shaft; these bars on the two outer feathers are bay, the rest more or less dusky, with a ferruginous tinge on those at the base.

Length 18 inches; extent of wings $44\frac{1}{2}$; wing from flexure $15\frac{1}{2}$; tail $9\frac{1}{2}$.

FEMALE.—The adult female, according to Temminck,

is very similar to that of the common harrier, from which however it may be distinguished by its smaller size, its longer wings, the difference in the relative length of the third quill, the whitish colour which predominates around the eye, and the numerous longitudinal spots of bright red on the lower parts.

HABITS.—This species is of very rare occurrence in England, and, in so far as I know, has not been observed in Scotland. I have never seen it alive, and, therefore, am unable to afford any information respecting its habits, which are described by authors to be similar to those of the common harrier.

PROPAGATION.—It is said to nestle on the ground, and to have four or five bluish-white eggs, smaller than those of the common harrier.

YOUNG.—The young, after their first moult, are similar to the female, differing however in having the lower parts of a uniform light red. Montagu describes a young male as follows: "The bill dusky; cere yellow; irides so pale a yellow as to appear nearly white. The whole upper part of the head ferruginous, with small dusky spots; on the hind head and nape, a broken patch of white; immediately above and beneath the eye is a pale streak; the coverts of the ears, extending down to the lower mandible, are dark chocolate brown; the feathers on the whole upper parts of the body, including the scapulars, are dark chocolate brown; the quills the same; the first three or four pale ferruginous about the middle of the inner web;

the secondary quills the darkest, and all more or less tipped with ferruginous, except on the upper part of the back, and those on the back of the neck are deeply margined with that colour; the lower part of the rump, and coverts of the tail, white, with a few streaks of bright ferruginous; the lesser coverts of the wings are deeply margined with ferruginous; the chin is dusky brown; the whole under parts, from chin to vent, including the thighs, under tail-coverts, and under coverts of the wings, bright ferruginous without spot, except the shafts being somewhat darker, appearing on close inspection like fine slender streaks; the tail-feathers have five alternate darker, and five paler, bars, but the upper ones are nearly obsolete; these bars on the outer feather are bright ferruginous and white, with one bar near the end darker; the second is similar, but has the ferruginous bars inclining to chocolate brown, and the white ones run into pale ferruginous on the outer webs; the three next become gradually darker, with the paler bars less conspicuous, and more ferruginous than white; the two middle feathers have the bars marked only by a shade of difference in colour, and are scarcely defined."

REMARKS.—Although in this species the ruff is obsolete, and the wings longer than in the others, there can be no doubt as to the propriety of referring it to the same genus; the resemblance which it bears to the common harrier being such, that the two species were always confounded until Montagu pointed out their differences.

- Ash-coloured Falcon. *Falco cineraceus*. *Mont. Ornith. Dict.*
Busard Montagu. *Falco cineraceus*. *Temm. Man. d'Ornith.*
Suppl. p. 76.
Circus cineraceus. *Selby, Illust.* vol. i. p. 70.
Buteo cineraceus. Ash-coloured Buzzard. *Flem. Brit. Anim.*
p. 55.
-

Having described the different species of the Falconine family, I now proceed to introduce those of the Strigine, or the Nocturnal Birds of Prey. The genus *Circus* exhibits the nearest affinity to the Owls generally; but some of the latter have also a marked relation to the genus *Falco* in particular, and others to the Buzzards, as will be subsequently explained.

FAMILY II. STRIGINÆ.

OWLS.

FOUR species of this family are of common occurrence in Britain, one is found more particularly in the north-eastern islands of Scotland, and four more have occasionally been met with in different parts of the country. They agree in possessing the following characters. Their body is ovate, very short, much broader and deeper before, very narrow behind; their neck short and slender, although, being covered with very long feathers, it seems extremely thick; their head extremely large, much broader than that of any other family; their wings long, very broad, and more or less rounded; their tail short.

The skeleton does not exhibit so much diversity as in the Falconine family. The cranium is remarkably short, and of extreme breadth, being much larger than in any other tribe of birds; but its bulk is in a great measure produced by the numerous cells that exist between its tables; the orbits are still larger than those of the Falconine birds, and are separated by a bony septum, which is generally complete; the lachrymal

bone is large, but the superciliary is not present as in the falcons; the nasal cavity is large, and that of the organ of hearing still more so. There are generally twelve cervical vertebræ, eight dorsal, twelve united lumbar and sacral, eight caudal; the extreme cultriform caudal vertebra is generally not half the size of that of the Falconinæ. The true ribs are seven, very slender, and with their posterior elongated processes remarkably so. The sternum is short, concave, with four deep sinuses behind, its crest or ridge of considerable height, its sides nearly parallel. The clavicles are flattened, and not very strong; the furcula very slender, its crura so disposed as to resemble the letter V; the bones of the wing of moderate length, but not remarkably strong. The pelvis is smaller than that of the hawks; but the bones of the leg are proportionally nearly as strong; the patella distinct; the tibia rather long, the slender fibula partially ankylosed to it; the tarsus generally short; the hind toe articulated to a small separate bone, and having two phalanges, the second three, the third four, the fourth five. The penultimate phalanx of all the toes is much longer than the rest, and those of the outer toe are extremely short.

The bill is in every case much shorter than the head, and is furnished at the base with a comparatively long cere, which is for the most part feathered, excepting its upper part. The upper mandible has its tip acute, prolonged, and curved over the rounded extremity of the lower. The palate is flat or prominent, sloping upwards at the sides, and marked with two longitudinal soft prominent lines; the aperture of the internal nares elliptical behind, anteriorly linear, and generally papillate on

its margins. The tongue is soft, fleshy, narrow, sagittate and papillate at the base, marked above with a central longitudinal groove, horny beneath towards the end, its extremity narrowed and bifid. The aperture of the glottis is defended behind by numerous papillæ directed backwards. The fauces are very wide, as is the œsophagus, which is nearly uniform in diameter, having no crop-like dilatation anterior to the furcula. It is encircled by inconspicuous muscular fibres, and its inner membrane is smooth. At its lower part its walls are much thickened, there being interposed between its outer and inner coats numerous cylindrical glandules, having a central cavity, into which a viscid fluid is secreted, and from which it passes into the stomach. The glandules completely surround the cavity of the proventriculus, which has the appearance of being a continuation of the œsophagus. The stomach is large, roundish, more or less compressed; its fasciculi of muscular fibres are usually separated from each other, and converge towards two thin roundish tendons placed on its opposite flattened sides. The inner coat is thin but tough, its surface very soft, smooth, destitute of rugæ. The pylorus, which is placed close to the cardiac orifice, is closed by a rim or sphincter, and has no other valvular apparatus. The intestine is slender, larger at the commencement, and continuing of nearly the same diameter about a fourth of its length, then gradually contracting to the rectum, at the commencement of which are two cœca, much longer than those of the falconine family, and enlarged towards the end. The rectum is much wider, and at the end dilated into a globular or funnel-shaped cavity.

The eyes are extremely large, directed obliquely forwards, so that an object is perceived with both; the upper eyelid is very large. The nostrils are large or of moderate size, oval or elliptical, in the fore edge of the cere. The ear is very large, having a concha varying in extent, in some cases extending from over the eye to beneath the lower jaw, and with its margins fringed with feathers.

The feet are in all the species of moderate length or short; the tarsi always covered with feathers, as are the toes to near the claws, although sometimes the feathers there are reduced to hairs, the barbs being wanting. The outer or fourth toe is capable of being turned backwards; the first is shortest and admits of much lateral motion, the fourth next in length, the second longest. They have a few scutella at the end, and are tuberculate and papillate beneath. The claws are long, curved, tapering, extremely acute, and have a great range of motion.

The wings are rather long, or of moderate length, broad, and generally more or less rounded. The primary quills are, as usual, ten; the secondary thirteen or fifteen. The tail is generally short, in no case very long, even or but slightly rounded, and always of twelve feathers, which are more or less curved.

The plumage is remarkable for its extremely soft texture. The eyes are surrounded by radiating feathers, having their barbs loose, and forming two circular disks or masks. Behind these disks is a ruff of narrow recurved feathers, in several rows, having their barbs close towards their tips. This ruff in some species completely surrounds the mask, while in others it

occupies only a portion of its posterior margin. The feathers of the neck are long, soft and elastic; those of the lower parts looser than those of the upper, the abdominal entirely downy. There is an elongated tuft over the femur, but none on the tibia, as in hawks. The shafts of the feathers are so feeble that they break on being bent in a small degree, their downy portion extends nearly to the end, and in many species the surface of the feathers is tomentose or covered with projecting barbicels, which are more especially apparent on the quills. The whole body is thus covered with a thick layer of soft down, among which are numerous very slender hairs having a few barbs at their extremity.

“An owl,” as Mr Waterton remarks, “is an owl all the world over;” by which, whatever may be his meaning, mine is, that no person who has seen two or three species can fail to recognise at a glance any other as belonging to the family. The facial disks, large eyes, thick soft plumage, and general aspect, distinguish these birds from all others.

They prey upon quadrupeds, birds, reptiles, fishes and insects; but their favourite food is small quadrupeds, which they clutch and perforate with their curved and extremely sharp claws. They carry off their prey when large in their talons, when small frequently in their bills. In the latter case, they swallow it entire. The bones, hair and feathers, which remain undigested, are cast up in pellets.

Their vision is extremely acute, but their eyes are so constructed that they can in general see distinctly

only in the twilight. The eye being extremely large, and the iris extremely sensible, and contractile or expansile in a greater degree than that of any other birds, they are enabled to adapt the size of the pupil to the degree of light. But although by far the greater number prey in the twilight, by moonlight, or in the shade of woods, some fly in open day. Their sense of hearing must be more acute than that of other birds, if one may judge by the size of the auditory apparatus.

Their flight is extremely light and buoyant, gliding, protracted when necessary, performed by rather slow, regular flaps of the extended wings, and so noiseless that even in a room one scarcely hears it. They fly in an apparently hesitating unsteady manner, searching the fields as they proceed, sometimes hovering, then sailing or skimming along, and again rowing themselves gently forward.

They perch on trees, rocks, or other elevated objects, and rest chiefly by day, but probably also at night in cloudy weather. They are incapacitated from walking in an effective manner by the structure of their feet, but grasp their perch with great security. When standing on a flat surface, they incline the body forwards, and keep only the first toe behind, the fourth being stretched outwards or forwards; but when on a narrow surface, such as that of a branch, they bring the fourth toe backwards, placing it and the first in opposition to the rest, and securing their hold by means of the tips of their claws, which are much bent for the purpose.

They are solitary, or live in pairs, and none of our species are in any degree gregarious. When they

happen accidentally to appear in open day, they seem bewildered, and are usually assailed by various species of small birds, which gather round and insult them. They utter a harsh disagreeable scream when flying at night, and some species emit sounds which are denoted by the term hooting.

Their nest is rude, generally composed of grass and twigs, with a lining of wool, feathers, or other soft materials; or the deserted nest of a crow is adopted. The eggs are remarkably round, always white, and vary in number, according to the species, from two to four. The nest is placed in the hollow of a tree, in the cavities of ruins or rocks, and sometimes in outbuildings, steeples, pigeon-houses, or on the ground. They nestle at a very early period. The young, which are at first covered with thick, soft down, remain long in the nest, and when able to shift for themselves are driven off.

The annual substitution of new for the old plumage is always very gradual. The feathers suffer much less by friction than those of most other birds, and the colouring remains almost unimpaired to the last. The young differ very little in colour from the adult; but the older the individual becomes, the more simple is the colouring; the dark markings diminish in extent, and the finer mottlings are gradually obliterated.

There is no partial moult, or temporary appearance of feathers on particular parts; those species which have tufts on the head, retaining them at all seasons. These tufts have absurdly been named horns and ears.

Owls thrive well in captivity, and may be tamed in a great degree; but from their habits they have never,

like the diurnal rapacious birds, been used for hunting.

The arrangement of the birds of this family is much more difficult than that of the preceding, their differences being of a less decided character. Cuvier disposes of them in the following manner:—

1. *Otus. Hiboux.* Two tufts of feathers on the forehead; conch of the ear extending in a semicircle from the bill to near the top of the head, and furnished anteriorly with a membranous operculum; disks of slender feathers surrounding the eyes very complete; feet feathered to the claws. Ex.: *Strix Otus, Linn.*; *Str. Brachyotos, Gmel.*

2. *Ulula. Chouettes.* No tufts on the head; the ear and bill as in the last genus. Ex.: *Str. lapponica, Gmel.*; *Str. nebulosa, Gmel.*

3. *Strix. Effrayes.* No tufts on the head; conch of the ear as large as in the preceding groups; bill curved only near the end, whereas in the other genera, it is arched in its whole length; tarsi feathered, but the toes covered only with hairs; disks larger, and giving them a still more extraordinary aspect. Ex.: *Str. flammea, Linn.*; *Str. badia, Temm.*

4. *Syrnium. Chats-Huans.* Disk and ruff as in the above; but the conch reduced to an oval cavity, which does not occupy more than half the height of the skull; no tufts; feet feathered to the claws. Ex.: *Str. Aluco, Linn.*

5. *Bubo. Ducs.* Conch as small as in the last genus, disks less distinct; tufts on the head; large feet, feathered to the claws. Ex.: *Str. Bubo, Linn.*

6. *Noctua. Chevèches.* No tufts nor conch; aperture of the ear oval, scarcely larger than in other birds; disks still smaller and less complete than in the last genus. Ex.: *St. funerea*; *Str. nyctea*; *Str. Tengmalmi*; *St. passerina*. Some Chevèches have the feet bare, as *Str. cayennensis*, Gmel.

7. *Scops. Scops.* No conch; disk imperfect; feet bare; tufts like those of the genus *Bubo*. Ex.: *Str. Scops*.

This is obviously a very confused and unsatisfactory arrangement. The characters given to the ear in several of the genera are not merely imperfect, but absolutely incorrect, as will be seen by referring first to my figures and descriptions in the following pages, and then to the objects themselves, as opportunity may occur; for it is not to "the prince of naturalists," nor the "chief of anatomists," but to *Le Grand Duc*, *Les Hiboux*, and all the *Chouettes* and *Chevèches* themselves that we must go for information. If *Otus* and *Ulula* have no other differences than the presence or absence of tufts on the head, they ought to be united. But there is no end to remarks of this kind, nor to the inconsistencies which give rise to them.

M. Isidore Geoffroy St Hilaire proposes the following method in *Annales des Sciences Naturelles*, vol. xxi. p. 194. He divides the Linnean genus *Strix* into two sections.

SECTION I.—*Disks imperfect.*

1. *Noctua. Chevèches.* Scarcely any traces of disks; no tufts; all the upper part of the head covered with feathers directed backwards, and similar to those of the

rest of the body ; aperture of the ears oval, and scarcely larger than in the diurnal birds of prey ; bill curved from the base :

2. *Bubo*. *Ducs*. Feathers on the upper part of the head as in the last genus ; the disk very incomplete ; an erectile tuft on each side of the head ; apertures of the ears rather large, but not nearly so much so as in the genera of the second section ; bill curved from the base.

3. *Phodilus*. *Phodiles*. Feathers on the upper part of the head as in the preceding genera ; disks imperfect ; no tufts ; apertures of the ears large, the conch smaller than in the genus *Strix* ; bill straight at the base. *Strix badia*, *Horsf.*

SECTION II.—*Disks complete or nearly so.*

4. *Syrnium*. *Chats-Huans*. Disks incomplete, but very distinct ; ears larger than in the preceding genera, smaller than in the following ; no tufts ; bill curved from the base.

5. *Ulula*. *Chouettes*. Disk complete ; conch extending from the bill to near the top of the head. Two genera, *Otus* and *Ulula* of Cuvier, have been formed of species having this character, according as they have tufts or not. *Strix brachyotos* forms the transition from the one to the other.

6. *Strix*. *Effrayes*. Disk complete ; conch very large ; bill straight in a great part of its extent, &c.

This arrangement, like all others, is liable to objections ; but, in our present imperfect knowledge of the structure of owls, might be adopted without much im-

propriety. As its author has united the genera *Ulula* and *Otus* of Cuvier, which are tuftless and tufted owls otherwise similar, it is strange that, for the same reason, he has not united his own genera *Noctua* and *Bubo*, which also are tufted and tuftless owls, generally similar. As the birds of this family have not undergone sufficient investigation, it is clear that the limitation of the generic groups cannot at present be permanently fixed. For this reason, although various arrangements have been proposed, I intend to add another to the list, considering it merely as temporary. Were the observations respecting the structure of the ear of owls made by Cuvier and others tolerably correct and sufficiently detailed, the number of genera would, I believe, be much smaller than it is usually considered.

It appears to me that, in conformity with the views given in the Preface, the presence or absence of tufts of feathers on the head or neck of birds cannot be of much value in determining generic groups. Thus *Pernis cristatus* is not considered generically different from *Pernis apivorus*; nor *Tetrao umbellus* from *Tetrao canadensis*; and certainly the male of *Strix brachyotos*, which has tufts on the head, cannot belong to a different genus from the female of the same species, which, if it has tufts, has them so short that they cannot be perceived in the ordinary state of the bird. For this reason, as the genera *Noctua* and *Bubo* of Cuvier and St Hilaire, differ, according to their own statements, in little or nothing else, they might be united under the name *Syrnium*. *Noctua* was a name applied by Linnæus to a group of insects, and moreover is very inapplicable to the diurnal or accipitrine owls; and

Bubo might with propriety be left as a specific name; more especially as unobjectionable names may be had. *Syrnium* being the Latinized Greek for an owl, seems to be perfectly eligible. This first genus *Syrnium* would naturally be divided into two sections, the first containing the smooth-headed, the second the tufted species. In this manner four of our nine British owls would be disposed of, viz. *Strix nyctea*, *St. passerina*, *St. Bubo*, and *St. Scops*.

Another genus might be composed of St Hilaire's *Syrnium* and *Ulula* united, the former being smooth-headed, the latter both tuftless and tufted; so that in this genus, to which I would give the old and approved name *Ulula*, there would also be two sections; the first including *Strix Aluco* and *St. Tengmalmi*, which are smooth-headed, the other *St. otus* and *St. brachyotos*, which have tufts on the head.

All these birds have the bill curved from the base; but one remains, in which the upper outline of that organ is straight as far as the end of the cere. This species, *Strix flammea* of Linnæus, being perhaps the best known, and I believe that which is most extensively distributed, might retain its name unaltered. It would form the third genus of British owls.

Now, this arrangement would answer remarkably well, were it certain that the structure of the organs corresponded in the different species of the genera within certain limits. This, however, can be ascertained only by examining them, and that neither by a mere field naturalist, nor by any means by a closet naturalist, but by a person handling and examining the objects and parts, comparing and contrasting, describing

and depicting, them, and connecting the habits of the species with their structure.

Instead of misapplying ingenuity by inspecting skins and comparing descriptions, I have commenced the examination of the birds themselves; but not having been able to procure a sufficient number of exotic species entire or in spirits, I am induced for the present to extend my generic groups. Those which I propose are six. But as the ear is considered an organ of primary importance in the classification of owls, I shall, in the first place, take the liberty of saying a few words respecting it.

In the pheasant, which I select, as a fresh specimen is now lying beside me, and most other birds, the external ear is of a roundish form, and of moderate or small size. It presents the appearance of a circular thickened rim covered with skin, slightly elevated above the neighbouring parts, and on its outer edge beset with feathers disposed in a circle, the anterior ones much longer, recurved, and in the ordinary state lying over the aperture of the ear. In the pheasant, the external aperture is two-twelfths and a half in diameter. An irregular cavity exists within this rim, at the bottom of which is a transverse, oblong opening or slit, two-twelfths and a half long, and one-twelfth broad, which is the meatus auditorius externus, analogous to what is vulgarly called the hole of the ear in man. In the pheasant, it is placed at the depth of three-twelfths of an inch, and leads to the membrane of the tympanum, which separates the internal from the external ear.



Beyond this membrane it is not our business at present to penetrate.

In the eagles and hawks generally, the structure is similar, the form of the external aperture varying from oblong to circular. Thus, in the peregrine falcon and sparrow hawk, the same parts are seen, the external rim being merely thinner. Among these birds, however, there is a group



which exhibits a decided difference in the appearance of the parts. The common harrier, *Circus cyaneus*, which presents so great a resemblance to the owls, as already mentioned, has the external ear of an oblong form, and very large size, compared with that of other hawks. It is about half



an inch in length, and beset round the thin edges with slender recurved feathers. It is divided in a manner longitudinally into two portions by a process of the occipital bone covered with skin, its anterior part being sunk, and exhibiting a longitudinal slit four-twelfths of an inch long, which is the opening of the meatus. From its inferior margin proceeds downwards and forwards to the base of the lower jaw a narrow curved space of bare skin, more than half an inch long; along

the posterior edge of this bare space, and also behind the aperture of the ear, is a kind of ruff, composed of several series of short, recurved, compact feathers. The transition from this kind of ear to that of the owls is direct. In fact, we have in the hen-harrier a decided conch, which is always described as peculiar to the owls. This conch, it may here be explained, is just a large auricular aperture, with elevated membranous margins, which are beset with feathers. When its anterior margin is much elevated and stiffened by the tubes of the feathers, that part is named the operculum or lid.

The largest auricular aperture of any British falconine bird, excepting the genus *Circus*, examined by me, that of the golden eagle, is five-twelfths of an inch in length; the smallest of any strigine bird, that of the passerine owl, is also five-twelfths; but of course, in the latter, the ear is, in proportion to its size, very much larger than in the eagle.

It is a curious fact, however, which may startle the ornithologists, who generally seem to attend very little to these things, that many birds have ears as large as those of some of the owls. Thus, the Creeper, *Certhia familiaris*, has the head five-twelfths and a half in height (without the plumage), while the external aperture of the ear is two-twelfths, and the conch, including its margins, two-twelfths and a half. The Wren, *Troglodytes europæus*, presents exactly the same proportions. The Greenfinch, which has the head seven-twelfths deep, has the external aperture of the ear two-twelfths and three-quarters in diameter, the commencement of the slit-like meatus two-twelfths and a half. The Thrush, *Turdus musicus*, has the head eleven-

twelfths high, the ear three-twelfths and a half in diameter, its inner aperture two-twelfths and three-quarters. Thus, even the Thrushes have ears nearly as large as those of the Hawk-Owls, and the Creeper and Wren equal the Eagle-Owl in the relative size of their auricular aperture.

In some species of owl, the external aperture of the ear is not much larger in proportion to the size of the head than in the *Circi* as above represented; but in others it is of enormous size, and extends from the base of the lower mandible to over the eye. The various gradations will be explained in the following empirical generic characters.

It may be proper to mention here, that the birds of the first three genera have no tufts of elongated feathers on the head, whereas those of the last three are furnished with those appendages, the use of which is one of the many mysteries.

GENUS I. SYRNIA. HAWK-OWL.

External ear or concha about one third of the height of the head, elliptical, with a slight elevated margin beset with feathers. Aperture of the external tube or meatus large, oval, in a depression in the lower part of the concha. Facial disks incomplete above the eyes. Ruff inconspicuous and incomplete. Bill short, strong, its upper outline curved from the base; nostrils roundish. Wings rounded, the third quill longest. P. 345.



HEAD OF SYRNIA NYCTEA.

Of this genus I am unable to present a figure of the ear, having access only to skins, in which its characters are in a great measure destroyed.

1. *Syrnia nyctea*. *Great White Hawk-Owl or Snowy Owl*.—White, with dark brown spots on the upper parts; younger birds with more spots above, and transversely barred beneath; toes covered with loose-edged shaggy feathers. P. 348.

2. *Syrnia passerina*. *Little or Passerine Hawk Owl*.—Upper parts wood-brown, spotted with white; lower parts yellowish-white with longitudinal brown markings; toes with bristly feathers, between which the scales are apparent. P. 359.

GENUS II. ALUCO. WOOD-OWL.

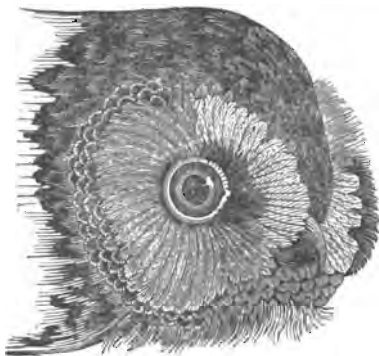
Conch of the ear more than half the height of the skull, extending from the base of the lower jaw to the level of the upper part of the eye, fringed with feathers all round, and having anteriorly an elevated semicircular stiff operculum extending along its whole length. The aperture of the meatus oblique, elliptical, at the lower part of an oblong cavity, which is half the length of the concha. The bottom of the concha is formed of the bones of the skull and the outer edge of the eye-ball, covered with skin. Facial disks very large, complete. Ruff conspicuous and complete. Bill short, strong, its upper outline curved from the base; nostrils roundish. Wings much rounded, the fourth quill longest, the first about the length of the tenth. P. 364.



EAR OF ALUCO STRIDULUS.

1. *A. stridulus*. Common Wood-Owl or Tawny Owl.—Of the younger birds of both sexes the upper parts brownish-

red, longitudinally streaked and mottled with dark brown ; of old birds the upper parts greyish-brown, similarly mottled ; in all, large white spots on the wings. P. 367.



HEAD OF ALUCO STRIDULUS.

2. *A. Tengmalmi*. *Tengmalm's Wood-Owl*.—Upper parts liver-brown, spotted with white ; lower parts yellowish-white with longitudinal brown markings ; tarsi and toes covered with long soft downy feathers. P. 378.

GENUS III. STRIX. SCREECH-OWL.

Conch of the ear extending from the base of the lower mandible to over the eye, narrow, not depressed, edged with very slender feathers, and having anteriorly an elevated, somewhat semicircular, abruptly cut, operculum, extending along half its length. The aperture of the meatus is very large, subrectangular, oblique, with an upper and a lower somewhat elevated margin, and situated about the middle of the operculum. The bottom of the concha is an elevated flap of skin. Facial disks very large and complete. Ruff conspicuous and complete. Bill short, moderately stout, its upper outline straight to the end of the cere; nostrils subovate. Wings rather sharp, the second quill longest, but scarcely longer than the first. Claw of third toe serrate, which is not the case with any other British owl. P. 382.



EAR OF STRIX FLAMMEA.

1. *Strix flammea*. Common Screech-Owl, or Barn Owl.—Upper parts light reddish-yellow, variegated with ash-grey, and small black and white spots; lower parts white, with small dusky spots. P. 388.

GENUS IV. ULULA. TUFTED-OWL.

Conch of the ear extending from the base of the lower mandible to over the middle of the eye, subelliptical, curved, depressed, having anteriorly an operculum in its whole length, and behind a broad membranous margin, both beset with recurved feathers. Aperture of the meatus elliptical, in the lower part of a cavity occupying nearly half the height of the conch. The bottom of the conch is formed anteriorly by the outer edge of the eyeball and the orbit, posteriorly by a thin edge of the occipital bone, above by the bones of the skull, all covered with skin, which is puckered up into folds. Facial disks

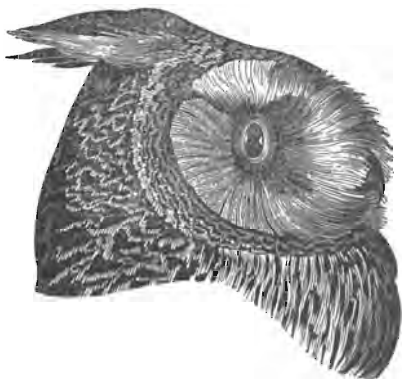


EAR OF ULULA OTUS.

very large and complete. Ruff conspicuous and complete. Bill short, of moderate strength, its upper outline slightly curved from the base; nostrils oblong. Wings rounded, the second quill longest, the first about the length of the fourth. P. 399.

1. *U. Otus*. *Mottled Tufted-Owl, or Long-eared Owl.*—

Tufts of about twelve feathers, projecting about an inch beyond the plumage of the head ; upper parts light reddish-yellow, spotted and undulated with brown and greyish-white ; facial disk whitish anteriorly, pale yellowish-brown behind, the eye half surrounded by dark brown. P. 403.



HEAD OF ULULA OTUS.

2. *U. Brachyotus*. *Streaked Tufted-Owl, or Short-eared Owl*.—Tufts of three-feathers, projecting about half an inch beyond the plumage of the head ; upper parts light reddish-yellow, broadly streaked and barred with deep brown ; the lower with narrow brown streaks ; facial disk whitish anteriorly, pale yellowish-brown behind, the eye completely surrounded by brownish-black. P. 412.

GENUS V. BUBO. EAGLE-OWL.

Conch of the ear more than half the height of the skull, extending from near the base of the lower jaw nearly to the level of the upper edge of the orbit, elliptical, deep, with an elevated margin beset with short curved feathers. The aperture of the meatus large, elliptical, oblique, in the lower part of the concha, the bottom of which is formed of the outer edge of the eyeball and orbit, with the occipital bone behind, covered with skin. Facial disks incomplete above the eyes.



HEAD OF BUBO MAXIMUS.

Ruff inconspicuous and incomplete. Bill short, very strong, deep, its upper outline slightly curved at the

base; nostrils roundish. Wings rounded, the third quill longest. Tarsi very strong, densely feathered.

This genus has the ear similar to that of *Aluco*, but without an anterior stiff operculum. It more strongly resembles that of *Syrnia*, but is much larger. The disks and ruff also are similar to those of the latter genus. In fact, as I have already intimated, *Syrnia* and *Bubo* might probably be united, were a sufficient number of species examined, although the former is tuftless and the latter tufted. P. 422.

1. *B. maximus*. *Great Eagle-Owl*.—Tufts of about nine feathers projecting more than two inches beyond the plumage of the head; the upper parts variegated with dark brown and light reddish-yellow; the lower of the latter colour, marked with longitudinal blackish-brown spots and streaks, and very numerous transverse undulating lines. P. 426.

GENUS VI. SCOPS. OWLET.

Conch of the ear about one-third of the height of the head, elliptical, with a slightly elevated margin beset with feathers. Aperture of the meatus large, elliptical, in a depression in the lower part of the concha. Facial disks incomplete above the eyes. Ruff inconspicuous and incomplete. Bill short, strong, its upper outline curved from the base; nostrils large, roundish. Wings rounded, the third quill longest. Tarsi slender, covered with short feathers or half bare.

This genus is intermediate between *Bubo* and *Syrnia*; and thus completes the circle of affinities, as will be subsequently explained. P. 442.

1. *Scops Aldrovandi*. *Tufted Owlet*.—Tufts of about twelve feathers; upper parts variegated with grey and brown, and streaked with brownish-black. P. 444.

SYRNIA. HAWK-OWL.

BILL short, strong, compressed towards the end, with the tip curved: upper mandible with the cere short, the dorsal outline curved from the base, the ridge broad and slightly convex, narrowed towards the end, the sides anteriorly convex, the edges soft and obtuse at the base, sharp and hard towards the end, the tip acute, nearly perpendicular; lower mandible straight, its crura short, the angle broad and rounded, the short dorsal line convex, the back broad and convex, the edges soft and meeting those of the upper until near the end, where they are sharp and inflected, their outline decurved and with a shallow sinus on each side close to the rounded tip; the gape-line nearly straight as far as the curvature of the tip.

Mouth wide. **Nostrils** in the fore part of the cere, roundish. **Eyes** very large; eyelids without distinct ciliary fringes, and with broad thin margins. **Aperture of the ear** large, oval, in the lower part of an elliptical concha, having all round a slightly elevated margin beset with feathers.

Head large, broad and rounded, anteriorly narrowed, but less so than in the other genera; **neck** short; **body** deeper than broad, much compressed behind. **Legs**

rather short, stout; tibiæ of moderate length; tarsi short, covered with feathers; toes also short, and covered above with feathers having hair-like separated barbs, in some species reduced to bristles having only a few lateral filaments, with two scutella at the end, tuberculate and covered with flattened papillæ beneath; the first very short and admitting of much lateral motion, the fourth next in length and reversible, the third longest, but not much exceeding the second; claws long, curved, tapering, very acute, rounded above, compressed, slightly convex on the sides, narrow beneath, excepting that of the third toe, which has a thin dilated inner edge.

Plumage soft and full, compact on the upper parts, blended beneath. Facial disks incomplete above the eyes, their feathers with loose barbs, those directed forwards and partially concealing the bill longer and more bristly, with elongated shafts; the ruff inconspicuous and incomplete. The feathers in general are oblong and rounded, those of the abdomen downy, of the legs with soft disunited barbs. Wings of moderate length, broad, rounded; primary quills broad and rounded, the first three or four deeply sinuate on the inner, slightly so on the outer webs, the third longest; secondary quills fifteen, broad, rounded. Tail of varied length, broad, of twelve rounded, slightly arched feathers.

Some of the birds of this genus are those of the family of owls that approach nearest to the falcons in their structure. Such, in particular, are the Hawk-Owl, *Strix funerea* of Gmelin and Latham, and the

Strix uralensis of Pallas. The Snowy Owl, *Strix nyctea* of Linnæus, has a less accipitrine aspect, and other species, as *Strix passerina* of Linnæus, having a proportionally larger head and shorter tail, are more strictly strigine. The latter species is very intimately allied to *Strix Tengmalmi*, which may with more propriety be referred to a different genus.

Two species have been found in Britain, *Syrnia nyctea* and *Syrnia passerina*, both very rare.

SYRNIA NYCTEA.

THE GREAT WHITE HAWK-OWL, OR SNOWY OWL.

THE old birds of both sexes white, with some brown spots on the head, scapulars and wings; younger individuals marked above with transversely oblong or lunulate umber-brown spots, beneath with transverse undulated bands. Tarsi and toes covered with long shaggy feathers.

MALE.—The Snowy Owl, which is the largest species of the family found in Britain, excepting the eagle owl, is a very beautiful bird, more especially remarkable for its white colour, more or less spotted with brown. Although comparatively robust, it owes its bulky appearance chiefly to its abundant clothing of soft elastic feathers. The head is very large and round, the face flattened, the neck short, and, although not remarkably strong, seeming very thick on account of its long plumage. The feet are short, strong, and covered with long loose feathers.

The outline of the upper mandible is curved from the base, although but slightly so along the cere, its ridge broadly convex to the edge of the cere, narrowed towards the tip, which is acute and nearly perpendicular at its extremity, the sides sloping at the base, very convex and nearly erect towards the end, the edges

sharp beyond the cere. The lower mandible has the angle broad and rounded, the dorsal line convex, the sides convex, the edges sharp and inflected, with a shallow notch close to the truncato-rotundate tip. Each of the toes has two distinct scutella at the end. The claws are long, much curved, slender, and extremely acute; the first, which is the smallest, and the fourth, which is next in size, are rounded beneath, the second flattened, the third convex with an inner edge, both much larger, and nearly equal.

The feathers on the face are long and slender, with disunited barbs, those at the base of the bill bristle-tipped and elongated so as nearly to cover that organ; but the facial disks are incomplete, the part above the eye being covered with shorter feathers nearly of the same texture as those on the upper part of the head, and the ruff extending only along a small portion of their posterior margin. The feathers of the upper parts in general are broad, rounded, and rather compact, of the lower softer and more downy. The wings are long and rounded; the primary quills broad and rounded, the first four deeply sinuate on the inner web, the first with the tips of its outer barbs recurved and free, the next three slightly cut out along the outer web; the third longest, the fourth a little shorter, the second about five-twelfths of an inch shorter, the first shorter than the fifth; the secondary quills broad and rounded. The tail is of moderate length, exceeding the wings by about an inch and a half, rounded, of twelve broad, rounded feathers.

The bill is black; the iris pure gamboge yellow; the claws black. The general colour of the plumage is

white; some of the feathers of the upper part of the head marked with a small oblong brown spot; the scapulars and wing-coverts with two spots towards the end; the quills and tail-feathers also having a few spots indicative of the previous existence of bands; the breast and sides are narrowly banded.

Length to end of tail 23 inches, to end of wings $21\frac{1}{2}$; wing from flexure $17\frac{1}{2}$; tail $9\frac{1}{2}$; bill along the ridge $1\frac{9}{12}$, along the edge of the lower mandible 2; tarsus $\frac{8}{12}$; the first toe $\frac{5}{12}$, its claw $1\frac{4}{12}$; second toe $1\frac{5}{12}$, its claw $1\frac{7}{12}$; third toe $1\frac{7}{12}$, its claw $1\frac{6}{12}$; fourth toe $\frac{1}{2}$, its claw $1\frac{5}{12}$.

FEMALE.—The female, which greatly exceeds the male in size, resembles it in colour, the dark markings, however, being larger.

Length to end of tail 27 inches, to end of wings 25; wing from flexure 18; tail $9\frac{1}{2}$; bill along the ridge $1\frac{11}{12}$, along the edge of lower mandible 2; tarsus $2\frac{1}{2}$; first toe $\frac{4}{12}$, its claw $1\frac{4}{12}$; second toe $1\frac{5}{12}$, its claw $1\frac{5}{12}$; third toe $1\frac{1}{2}$, its claw $1\frac{1}{2}$; fourth toe $\frac{10}{12}$, its claw $1\frac{1}{2}$.

VARIATIONS.—The principal variations are observed in the size of the dark spots and bars, which are larger in the younger individuals, and gradually diminish the older the bird becomes. Mr Audubon states that, in North America, individuals of a uniform white colour are not unfrequently found. Of the different skins which I have examined, none, however, were entirely white.

HABITS.—Not having met with the snowy owl in

the wild state, nor having seen more than two individuals alive, I am unable to present an original account of the manners of that interesting species. I must, therefore, have recourse to the descriptions of those who have studied them in its haunts. Mr Audubon's is to the following effect.

In the United States of America, where it is only a winter visitant, it hunts by day as well as in the dusk, passing over the ground with a smooth and noiseless but firm flight, and seizing its prey by falling suddenly upon it. When it pursues a bird on wing, it overtakes it by its superior speed, and strikes it somewhat in the manner of the peregrine falcon. Its usual food, however, is hares, squirrels, rats, and fish; of its mode of capturing the latter of which, Mr Audubon gives the following account.

“ At the break of day, one morning, when I lay hidden in a pile of floated logs, at the Falls of the Ohio, waiting for a shot at some wild geese, I had an opportunity of seeing this owl secure fish in the following manner:—While watching for their prey on the borders of the ‘pots,’ they invariably lay flat on the rock, with the body placed lengthways along the border of the hole, the head also laid down, but turned towards the water. One might have supposed the bird sound asleep, as it would remain in the same position until a good opportunity of securing a fish occurred, which I believe was never missed; for as the latter unwittingly rose to the surface, near the edge, that instant the owl thrust out the foot next the water, and, with the quickness of lightning, seized it, and drew it out. The owl then removed to the distance of a few yards, devoured

its prey, and returned to the same hole; or, if it had not perceived any more fish, flew only a few yards over the many pots there, marked a likely one, and alighted at a little distance from it. It then squatted, moved slowly towards the edge, and lay as before watching for an opportunity. Whenever a fish of any size was hooked, as I may say, the owl struck the other foot also into it, and flew off with it to a considerable distance. In two instances, I saw the bird carry its prey across the Western or Indian Chute, into the woods, as if to be quite out of harm's way. I never heard it utter a single note on such occasions, even when two birds joined in the repast, which was frequently the case when the fish that had been caught was of a large size. At sunrise, or shortly after, the owls flew to the woods, and I did not see them until the next morning, when, after witnessing the same feats, I watched an opportunity, and killed both at one shot."

Dr Richardson also states that it hunts by day, and remarks that, unless it could do so, it would be unfit to pass the summer within the Arctic circle. "When I have seen it," he continues, "on the barren grounds, it was generally squatting on the earth, and, if put up, it alighted again after a short flight, but was always so wary as to be approached with great difficulty. In the woody districts it shews less caution; and, according to Hearne, has been known to watch the grouse-shooters a whole day, for the purpose of sharing in the spoil. On such occasions it perches on a high tree, and, when a bird is shot, skims down and carries it off before the sportsman can get near it. It preys on lemmings, hares, and birds, particularly the willow-grouse and

ptarmigan. I have seen it pursue the American hare on the wing, making repeated strokes at the animal with its foot; but on that occasion, through the intervention of an Indian, it was driven from its quarry."

The snowy owl is, according to authors, an inhabitant of the Arctic regions of both continents. In winter it retires southward, without extending its migrations beyond the colder parts of the temperate zone. In our own country, it has been repeatedly observed, and shot in Shetland and Orkney, and individuals have occasionally strayed into England.

As a British species it was first described in 1812, in the Transactions of the Linnean Society of London, by Mr Bullock, who met with it in Orkney and Shetland. Mr Edmondston, in 1822, read a paper to the Wernerian Society of Edinburgh, which has been published in its Transactions, and in which he gives a very interesting account of its habits. As the work which contains his description may not be accessible to many of my readers, I shall take the liberty of presenting an extract from Mr Edmondston's paper.

"Although, as has been alleged by ornithologists, it may be more active and alert during the day than other congenerous species, and especially when it is once alarmed, yet I have never remarked it seeking for its prey but towards evening.

"It rests generally beneath some stony projection, which protects it from the direct influence of the sun; and some instances have occurred of its being surprised asleep during the day, and forfeiting its life to its supineness.

"Its form and manner are highly elegant; its flight

less buoyant, and more rapid, than that of the other owls; and the superior boldness and activity of its disposition, the uncommon size of its talons, and vigour of its limbs secure it against danger from feathered enemies.

“ It affects solitary, stony, and elevated districts, which, by the similarity to it in colour of the rocks, render it difficult to be discovered, and, by the inequalities of their surface, afford it shelter from the rays of the sun; but on the approach of twilight, it may be seen perching on the exposed eminences. It then quits its haunts, and frequents the cultivated fields, prowling over the low grounds, in quest of mice and small birds. When first observed to leave its retreat, it is frequently assailed by crows and other birds; but it receives their attacks rather as an amusement than an annoyance, and dashes through the air despising their hostility.

“ It preys chiefly on sandpipers, on which it pounces with precision and agility, as it skims along the marshes. The specimen given to Mr Bullock’s museum, had an entire one in its stomach when I shot it; and a mouse, perfectly whole, was taken from that of the present specimen.

“ I may here remark, that the stomach appears to be peculiarly small, and less membranous than what occurs in other carnivorous birds, and the food seems to be swallowed entire; indeed, its bill being feathered to its point, renders this almost necessary. When wounded or irritated, it hoots very vehemently, shaking its feathers, and striking rapidly with its feet; but otherwise it appears to be as silent as it is recluse.”

Mr Bullock, who met with it both in Orkney and in Shetland, although he procured only one specimen, differs from Mr Edmondston in alleging that it preys in mid-day; and of this opinion we see Dr Richardson and other observers to be. Recent British writers have not added any thing to our information respecting "this noble and beautiful owl." Perhaps I ought to except Mr Mudie, who is apparently very familiar with it.

"Time of day is a matter of indifference to the snowy owl during the storms or the fogs. When the sun is hot, it takes shelter under some ledge of those wild rocks, in the fastnesses of which it nestles, and annually rears its brood of a single pair. But when the snow drives it is twilight all the day long, and not very different during the fogs. At these times the snowy owl flies low, after the manner of the eagle owl, and the prey which it captures is so abundant, that it not only waxes fat during the storms, but retains its fatness when drifted by the winds to the distance of a thousand miles. Countries in which snow dims the eyes or fogs cloud the vision of those animals on which it preys, appear to be the most congenial to this interesting bird. Accordingly, it very rarely comes to the mainland of Britain; and when it does, it is always during violent snow-storms from the north, which also bring the northern birds, not generally visitants of our shores. When it comes, it perches on the top of a wreath, or on some stick or other point jutting out of the snow, and as it is not very unlike a lump of snow itself, it causes but little alarm in the birds, and so captures them with ease!"

How simple and beautiful is the hidden knowledge of nature when thus brought to light! And all this must be quite true. Mr Mudie has seen it, for he utterly abhors compiling, and "would rather stand convicted of dulness, vanity, and error jointly," than have it said that he had "in any way appropriated the labours of another man." "An original book always adds something to the mass of knowledge." I think otherwise: books, original enough, and compiled books too, may add more to the mass of error than of knowledge.

PROPAGATION.—In the northern parts of America, this "noble" and most puissant bird, which is "not very unlike a lump of snow," according to Dr Richardson "makes its nest on the ground, and lays three or four white eggs, of which two only are in general hatched." M. Temminck states that it "nestles on steep rocks, or on the old pines of the frozen regions; lays two white eggs; marked with black spots, according to M. Vieillot, but of a pure white according to other naturalists." This account is confirmed by Mr Selby:—"They breed on the ledges of precipitous rocks, the eggs being two in number, of a pure white according to most authors, but by Vieillot they are said to be spotted with black." I have only to add, that an egg in the Museum of the University of Edinburgh, said to have been laid by a "Harfang," is pure white and nearly globular, but unsymmetrical. The latter circumstance of course must be accidental.

YOUNG.—M. Temminck describes the young as be-

ing at first "covered with brown down," and as having their "first feathers also of a light brown."

PROGRESS TOWARD MATURITY.—Those who have had opportunities of observing this species, state that the brown spots and bars on its plumage gradually disappear, as it advances in age. Mr Edmondston's specimen, which he presented to Professor Jameson, and which forms a conspicuous ornament of the beautiful museum which owes its formation to him, was considered by the donor as a young bird. It agrees in colouring with another specimen in the same collection, from one of the Arctic expeditions.

In middle age, then, the general colour is white; the forehead, disks, throat, sides of the head, abdomen, tarsi and toes, unspotted. On the upper part of the head each feather has a brown spot; on the hind part of the neck two or three spots appear on each feather; and on the fore part of the back, the scapulars, and the wings, all the feathers and quills are transversely banded with brown, so that the upper parts in general appear marked with transverse lunulate spots. On the tail there are four bands. The breast, sides, and long feathers over the thighs, are marked with narrower transverse bars; the lower tail-coverts have each a small spot near the end.

REMARKS.—The snowy owl is, in form, intermediate between those species, such as *Strix funerea*, which have a decided resemblance to hawks, and the other generally smaller kinds, which, having a broader head and a shorter tail, resemble the species of the genus

Aluco. Of these latter, one, the *Syrnia passerina*, has sometimes been met with in Britain, and may be seen in most collections of stuffed birds. In size, the snowy owl takes the lead among the *Syrniæ*, and from it to the little species just mentioned there is a great transition; but exotic species are not wanting to fill up the gap.

In the *Fauna Boreali-Americana*, the head of this owl is described as "small." That of a living individual in the possession of Dr Neill measures six inches across, including the feathers. Its head is certainly much larger in proportion than that of several of our native owls, and is inferior to that of none excepting the tawny owl.

A "Manual of British Vertebrate Animals," by the Rev. Leonard Jenyns, M. A., having appeared since I finished my account of the Falconine birds, I shall, in treating of the Owls, refer to it in addition to those selected for that purpose.

Strix Nyctea. *Linn. Syst. Nat.* vol. i. p. 132.

Strix Nyctea. *Lath. Ind. Ornith.* vol. i. p. 57.

Snowy Owl. *Mont. Ornith. Dict. Suppl.*

Chouette Harfang. *Strix Nyctea.* *Temm. Man. d'Ornith.* p. 82.

Strix Nyctea. Snowy Owl. *Flem. Brit. Anim.* p. 58.

Snowy Owl. *Syrnia Nyctea.* *Selby, Illustr.* vol. i. p. 95.

Noctua Nyctea. *Jenyn's Brit. Vertebr. Anim.* p. 93.

SYRNIA PASSERINA.

THE LITTLE OR PASSERINE HAWK-OWL.

UPPER parts wood-brown, spotted with white; a broad white band across the throat; tail with four transverse rows of roundish white spots; lower parts yellowish-white, with longitudinal brown markings; toes with bristly feathers, between which the scales are apparent.

MALE.—This species, which is about the size of a jay, has the tail proportionally shorter than the last, and the bill remarkably strong and short, as are the claws. It is distinguished from the next species by the slender clothing of the toes, which in it are densely covered with feathers. The head is large, the neck short, the tarsi also short, and the wings of moderate length.

The outline of the upper mandible is curved from the base, its ridge convex, as are the sides, the edges sharp and incurved anteriorly, the tip short. The cere is short and bare on its upper part. The lower mandible has the angle broad and short, the dorsal line slightly convex, the edges inflected, towards the end incurved, with a shallow notch on each side close to the abruptly rounded tip. The toes are covered above with transverse series of obscurely defined scales, par-

tially concealed by bristle-like feathers, having a few barbs at their base. The claws are strong, tapering, little curved, compressed; the first and fourth, which are nearly equal in size and smaller than the rest, are rounded beneath, the second flattened but narrow, the third convex, with a thin inner edge, both much larger and nearly equal.

The nostrils are round, with two laminæ passing inwards from their outer edge, and covered above by a singular bulging projection of the cere, which is very short. The conch of the ear is an oval space five-twelfths of an inch long, and three-twelfths broad; in the lower part of which is the oval aperture or meatus, and which is destitute of operculum, being merely margined with feathers all round.

The facial disk is incomplete, being interrupted over the eye. The feathers at the base of the bill laterally are long, with bristle tips, and nearly conceal that organ; the lower part of the disk is narrow, but the hind part is large, and assumes the usual appearance of the ear-coverts of many other birds. The ruff is very incomplete and inconspicuous, the feathers being a little more curved than the rest. The feathers of the head are small, oblong, rounded, those of the back of the same form, but large and rather compact. Those of the lower parts are very soft and downy. The wings are long and rounded; the primary quills broad and rounded; the first three deeply sinuate on the inner web, the second, third, and fourth, distinctly so on the outer; the first with the tips of the barbs recurved on its outer edge, the second and third with the tips of their outer barbs less distinctly recurved to beyond the sinus; the

third quill longest, the fourth scarcely shorter, the second longer than the fifth, the first shorter than the sixth. The secondary quills are broad and rounded. The tail is short, nearly even, of twelve broad, decurved, rounded feathers.

The bill is greyish, its ridge and tip greyish-yellow. (The iris is said by authors to be yellow.) The claws are yellowish-brown, their tips dusky. The general colour of the upper parts is wood-brown. The feathers of the head have an oblong white central mark, and as they are small, that part is marked with numerous spots. On the hind neck the white spots are very large. On the back and scapulars, most of the feathers have two roundish spots; the wing-coverts one. All the quills have marginal whitish spots on both webs, those on the inner much larger. The tail is similarly marked, with four series. On the anterior part of the disk the feathers are whitish, with black shafts, on the lower part whitish tipped with brown, on the hind part brown tipped with white. A broad band of white crosses the throat and curves upwards on either side to the ear. There is also a large patch of white on the lower part of the fore neck. The general colour of the lower parts is yellowish-white, each feather with a broad longitudinal band of brown; the abdomen and lower tail-coverts unspotted; the tarsal feathers yellowish, with a few dusky spots externally. The base of the plumage is dark bluish-grey.

Length to end of tail $10\frac{1}{2}$ inches, to end of wings 10; extent of wings 20, wing from flexure $6\frac{1}{4}$; tail 3; bill along the ridge $\frac{1}{2}$, along the edge of lower mandible $\frac{8}{12}$; tarsus $1\frac{1}{4}$; first toe $\frac{5}{12}$, its claw $\frac{5}{12}$; second toe

$\frac{9}{17}$, its claw $\frac{7}{12}$; third toe $\frac{11}{12}$, its claw $\frac{64}{11}$; fourth toe $\frac{7}{8}$, its claw $\frac{41}{12}$.

FEMALE.—The female is similar, but considerably larger.

Length 11 inches; wing from flexure $6\frac{1}{2}$; tail $3\frac{1}{4}$.

REMARKS.—Mr Selby gives, as a character of his genus *Noctua*, in which he places this owl, "auditory conch large, with a narrow operculum;" but the auditory conch in this species is merely an oval space not nearly the height of the head, with the aperture of the ear in its lower part, and totally destitute of operculum, but fringed with feathers, as in a hawk. The curious bulged covering of the nostrils, of which he makes no mention, is very remarkable, and might tempt one to consider this species as forming, with some others, a genus distinct from that of the Snowy Owl; but *Strix funerea* and *S. passerina*, are in other respects very intimately allied; and the first of these has a strong affinity to *Str. Nyctea*.

The British species that approaches nearest to this genus is, on the one hand, *Strix Bubo* of Linnæus, which differs chiefly in having a larger and more flattened head, which is, moreover, furnished with large tufts; and, on the other, *Strix Tengmalmi*, which, although very closely resembling *Syrnia passerina* and *S. funerea*, appears from the development of the ruff, the more complete facial disks, and the larger conch, to belong to the genus *Aluco*. In fact the two genera pass insensibly into each other, more especially by the smaller species.

Strix passerina. *Linn. Syst. Nat.* vol. i. p. 133.

Strix passerina. *Lath. Ind. Ornith.* vol. ii. p. 65.

Little Owl. *Mont. Ornith. Diet.*

Chouette Chevêche. *Strix passerina.* *Temm. Man. d'Ornith.*
p. 92.

Little Night-Owl. *Noctua passerina.* *Selby, Illustr.* p. 107.

Noctua passerina. Little Owl. *Jenyns, Brit. Vertebr. Anim.*
p. 94.

ALUCO. WOOD-OWL.

BILL short, strong, compressed towards the end, with the tip curved: upper mandible mobile, with the cere long and tumid behind the nostrils, the dorsal outline curved from the base, the ridge broad at the base, narrow anteriorly, the sides rapidly sloping, convex towards the end, the edges soft and obtuse at the base, sharp and hard towards the end, the tip acute, nearly perpendicular; lower mandible straight, its crura short, the angle broad and rounded, the short dorsal line convex, the back broad and convex, the edges soft and meeting those of the upper until near the end, where they are sharp and inflected, their outline anteriorly decurved, with a sinus close to the truncato-rotundate tip; the gape-line nearly straight as far as the curvature of the tip.

Mouth very wide; palate flat, with a central and two lateral prominent soft lines, converging forwards; upper mandible soft within until near the tip, and having an elevated central line with soft tubercles; lower deeply concave, with a distinct central ridge; the aperture of the posterior nares oblong behind, anteriorly linear, the edges without papillæ, its sides covered to a great extent with small papillæ directed backwards.

Tongue narrow, fleshy, sagittate and papillate at the base.

Nostrils roundish, medial, near the ridge, in the fore edge of the cere, which is tumid behind them. Eyes very large, slightly mobile, obliquely situated; eyelids without distinct ciliary fringes, and with broad papillate thin margins, the upper very large. Conch of the ear subelliptical, extending from the base of the lower jaw to the level of the superciliary ridge, with an anterior semicircular operculum extending along its whole length; the meatus or aperture of the ear oblique, elliptical, at the lower part of an oblong deep cavity which is half the length of the concha.

Head very large, broad behind, somewhat triangular, flattened and sloping above, the sides flattish and sloping forwards; neck short, slender, but seeming extremely thick on account of the great mass of feathers; body short, slender, deeper than broad, much compressed behind. Legs of moderate length, stout; tibiæ rather long; tarsi short, feathered; toes also short, and covered above with feathers having hair-like separated barbs, with two scutella at the end, tuberculate and covered with flattened papillæ beneath; the first very short, and admitting of much lateral motion, the fourth next in length and reversible, the third longest, but not much exceeding the second; claws long, curved, tapering, very acute, rounded above, compressed, the sides slightly convex and inclinate, the lower surface narrow and edged, that of the third toe sharp, with a thin dilated inner edge.

Plumage soft and very full, compact on the upper parts, blended beneath. Facial disks very large, com-

plete, their feathers with loose barbs; the ruff conspicuous and complete. Bill partially concealed by the anterior feathers of the disk. The feathers in general are oblong and rounded, those of the abdomen downy, of the legs with soft disunited barbs. Wings long, very broad, much rounded; primary quills broad and rounded, the first five cut out on both edges, abruptly on the inner, the fourth longest, the third and fifth nearly equal, the first about the same length as the tenth; secondary quills thirteen, broad and rounded. Tail of moderate length, broad, of twelve arched, rounded feathers.

The birds of this genus closely resemble those of the last, but their head is larger and broader, the neck apparently thicker, the plumage generally softer. The disks are much larger, and the ruff being complete gives them a different aspect, while the ear has a large conch, covered with an anterior operculum, which does not exist in the genus *Syrnia*. As examples of this genus, may be mentioned *Strix nebulosa* and *Strix cinerea* of authors. The common Tawny or Brown Owl of Europe is the only species of general occurrence in this country; but another, *Strix Tengmalmi* of Temminck and other ornithologists, has in some few instances been found in England. Allied to it is *Strix acadica* of Linnæus, which is common to Europe and North America, but has not yet been observed in Britain.

ALUCO STRIDULUS.

THE COMMON WOOD-OWL, BROWN OR TAWNY
OWL.

Of the younger birds of both sexes the upper parts brownish-red, marked with dark brown longitudinal streaks, and principally mottled with the same, the lower pale greyish-yellow, with longitudinal linear-lanceolate and undulated transverse dark brown markings. Of old birds the upper parts greyish-brown, the lower reddish-white, marked as in the younger. In all stages, large white spots on some of the outer scapulars and wing-coverts.

MALE.—The common wood-owl has the head proportionally larger and broader than that of any other British species; the neck remarkably thick, the body bulky, the feet strong and closely feathered. But its great apparent bulk is caused by its profuse elastic downy plumage; for its body is short and thin, and its neck slender.

The bill is short, strong, compressed, its upper outline curved from the base, the sides rapidly sloping, the tip prolonged downwards, acute, and at the end perpendicular; the lower mandible has the crura narrow and flexile, the angle broad and rounded, the short dorsal line slightly convex, the edges anteriorly curved, with a sinus close to the truncato-rotundate tip. The

cere is rather long, bare above and anteriorly, but completely concealed, as is the greater part of the bill, by the long bristly feathers from its base; its margins convex before the nostrils, and passing obliquely downwards.

The mouth is very wide, the palate flattened, with a short central and two long lateral prominent soft lines converging forwards; upper mandible soft within until near the tip, and having numerous soft rounded prominences; lower deeply concave, with a narrow central elevated ridge. The œsophagus is wide, nearly uniform in diameter, five inches long, gradually dilated below at its junction with the stomach, where it is glandular all round. The stomach is large, its muscular coat very thin, but with distinct fasciculated fibres; the central tendons very thin and small, about five-twelfths across, the anterior larger. The pylorus is closed by a thin valvular margin. The intestine is twenty-two inches long, wider at the commencement, where it is for some inches thicker than a goose quill, being four-twelfths in diameter, gradually contracted to two-twelfths, and slightly enlarged near the cœca; after which it continues of the same size, but dilates as it approaches the globular cloaca. The cœca come off at the distance of three inches from the anus; in the individual here described, one was three inches and two-twelfths long, the other two inches and two-twelfths, both for half their length two-twelfths in diameter, but enlarged towards the end into an oblong sac four-twelfths in its greatest diameter.

The nostrils are medial, near the ridge, roundish, in the fore edge of the cere, which bulges out a little be-

hind them. The eyes are very large, slightly mobile, oblique, the upper eyelid very large, both with a thin bare papillate margin, which is discontinued at the two canthi. The conch of the ear is very large, of an irregular elliptical form, extending from the base of the lower jaw to near the top of the head, with an anterior semicircular operculum stretching along its whole length, and an elevated margin behind; this margin and the operculum are beset with recurved feathers, which are much shorter on the lower and posterior part. The bottom of the concha is formed of the bones of the skull and a portion of the eye, covered with skin; the meatus externus is elliptical, sunk in the lower part of an oblong depression, extending from the lower part of the conch to half its height. The conch is an inch and one-twelfth long, the depression seven-twelfths long and two and a half broad, the meatus two-twelfths and three-fourths long. The tongue is small, seven-twelfths long, sagittate and papillate at the base, concave above, horny beneath in its free part, emarginate.

The general form having been already described, it is only necessary here to mention that the toes have each two large scutella at the end, and that the claws are much curved, tapering to a fine point, narrow beneath, that of the third toe broad, with an outer sharp edge, and an inner thin dilated margin.

The plumage is extremely soft, full and elastic. The facial disks are complete, and composed of radiating feathers with disunited barbs. The ruff is also complete, and composed of several series of narrow recurved rather compact feathers. The feathers in ge-

neral are oblong and rounded, their downy part proportionally large and remarkably soft, with a short tufted plumule. The wings are rather long, very broad, much rounded, and reach two-thirds down the tail. The quills are much decurved; the first five primaries are abruptly cut out on the inner web near the end, the second, third, fourth and fifth slightly cut out on the outer; the fourth longest, the fifth scarcely shorter, the third and seventh nearly equal, the second longer than the eighth, the first and tenth equal; they are all rounded and curved at the end. The secondary quills, thirteen in number, are broad, long, and rounded. The tail is in reality longer than the body, although it seems short, on account of the tufted plumage; it is decurved and rounded, of twelve weak, rounded feathers, of which the lateral is an inch shorter than the central. The scapulars are long; the hypochondrial feathers form large tufts four inches long, and there is a tuft on each femur, but none on the tibia.

The bill is light greyish-yellow or horn-colour, the cere flesh-coloured, as is the mouth, excepting the anterior part of the palate, which is of a dull leaden tint. The iris is bluish-black. The soles of the feet are flesh-coloured, the claws yellowish-grey at the base, dusky or purplish-brown towards the end. The facial disks are anteriorly greyish-white with black shafts, posteriorly yellowish-brown. The ruff is yellowish-red mottled with brown above, at the middle brownish-black, below pale yellowish-brown. The general colour of the upper parts is light yellowish-red, mottled and longitudinally streaked with dark brown, the hind part of the back mottled without streaks, as are the two

middle feathers of the tail. Some of the outer scapulars, and smaller wing-coverts, with a few of the outer secondary coverts, have a large white spot on the outer web towards the end. The quills are broadly barred with umber brown and dull yellowish-red tinged with grey; the primary coverts similarly barred and darker. The tail feathers are marked in the same manner, their tips yellowish-white; both they and the quills are minutely mottled with yellowish-brown towards the end. The lower parts are light yellowish-red, fading behind into yellowish-white; the breast and sides longitudinally streaked, and transversely undulated or mottled with dark brown, the latter also spotted with dull white. The legs are buff-coloured, externally mottled; the feet yellowish-white tinged with grey, also minutely mottled with brown.

Length to end of tail 15 inches, to end of wings $13\frac{1}{4}$; extent of wings 32; wing from flexure $10\frac{1}{4}$; tail $6\frac{1}{2}$; bill along the back $1\frac{5}{12}$, along the edge of lower mandible $1\frac{4}{12}$; tarsus $1\frac{3}{4}$; first toe $\frac{7}{12}$, its claw $\frac{9}{12}$; second toe $1\frac{1}{12}$, its claw $\frac{10}{12}$; third toe $1\frac{5}{12}$, its claw $\frac{9\frac{1}{2}}{12}$; fourth toe $\frac{9}{12}$, its claw $\frac{8\frac{1}{2}}{12}$.

The above description is that of a recently killed individual obtained in the beginning of December.

FEMALE.—The female is considerably larger than the male, and resembles it in colour. This I have determined by dissection, and not merely conjectured. Let them who allege the contrary come forward. The following is the description of an individual obtained fresh in June 1835.

The bill yellowish-grey; the claws of the same co-

lour at the base, dusky towards the end; the iris bluish-black. The facial disks are anteriorly yellowish-white, pale reddish-brown behind, the feathers lying over the bill with black shafts. The ruff is yellowish-red mottled with brown above, at the middle very dark brown, with whitish spots, below yellowish-brown mottled with darker. The general colour of the upper parts is yellowish-red, streaked and mottled with blackish-brown; the head above is deep reddish-brown; the outer webs of the feathers of the hind neck near the end are whitish. Several of the scapulars, wing-coverts, and secondary coverts are white on the outer web near the tip, as in the male. The quills and tail are barred in the same manner. The colouring of the lower parts is precisely similar, and the lower tail-coverts in both are dull white, with lanceolate central dark brown spots.

The intestinal canal differs only in its proportions; the œsophagus being five inches long, its glandular part one inch; the stomach two and a half inches; the intestine thirty inches. The longest of the two cœca, which were nearly equal, was four inches and three quarters long; at their commencement, which was three and a half inches distant from the anus, they were of the same diameter as the intestine, which was there two-twelfths, its greatest diameter near the upper end being four and a half twelfths.

Length to end of tail 16 inches; to end of wings 14; extent of wings 32; wing from flexure $10\frac{1}{2}$; tail $6\frac{1}{2}$; bill along the ridge $1\frac{1}{2}$, along the edge of lower mandible $1\frac{3}{4}$; tarsus $1\frac{1}{2}$; hind toe $\frac{5}{12}$, its claw $\frac{5}{12}$; second toe $1\frac{1}{4}$, its claw $\frac{1}{2}$; third toe $1\frac{1}{2}$, its claw $\frac{1}{2}$; fourth toe $\frac{9}{12}$, its claw $\frac{8}{12}$.

Another female, obtained in April 1834, presented the following dimensions:—Length to end of tail 16 inches; extent of wings 34; bill along the back $1\frac{1}{4}$, along the edge of lower mandible $1\frac{5}{8}$; tarsus $1\frac{7}{8}$; middle toe and claw 2.

Old birds differ in their tints, although their markings are for the most part precisely similar. I have, however, had no recent opportunity of examining entire specimens, and therefore am obliged to have recourse to a stuffed one.

The facial disks are greyish-white, their outer feathers with a bar of dull brown near the end, forming two or three indistinct semicircles, the anterior feathers with the shafts blackish. The ruff is lighter than in young birds, but similarly marked. The general colour of the upper parts is pale umber-brown, tinged with grey, longitudinally streaked with darker, and transversely barred and mottled with greyish-white and greyish-brown. The lower parts are also paler than in the young, but similarly marked. The red and yellow tints have greatly faded, and the upper parts have acquired a grey tinge, but in other respects the colouring is similar.

Length to end of tail 16 inches; wing from flexure $10\frac{1}{2}$; tail 7; bill along the back $1\frac{1}{2}$; tarsus $1\frac{9}{10}$; first toe $1\frac{7}{8}$, its claw $\frac{8}{12}$; second toe $1\frac{9}{12}$, its claw $1\frac{1}{8}$; third toe $1\frac{5}{12}$, its claw $\frac{10}{12}$; fourth toe $1\frac{0}{12}$, its claw $\frac{8\frac{1}{2}}{12}$.

VARIATIONS.—Individuals vary considerably in their tints, although the style of marking is similar. Little change takes place in the feathers as the period of moulting approaches.

HABITS.—This species appears to be pretty generally distributed in Britain. In England it is said to be nearly equally common with *Strix flammea*; but this certainly is not the case in Scotland, and in the northern parts of that country it is not met with. It is strictly crepuscular and nocturnal, resting by day on some tree in the midst of the thick woods, from whence it issues in the twilight. When forced from its retreat during the day, it seems bewildered, being evidently oppressed by the glare of light. Its food consists of small quadrupeds, such as moles and mice, birds of various kinds, beetles and other insects. In the stomach of one I was surprised to find a large quantity of earthworms, cut into fragments about half an inch long; and several persons have stated that it feeds also on fish. At night it occasionally utters a harsh scream, and emits a low sound resembling the syllables hoo-hoo-hoo. "This is its cry," says Buffon, "*hou ou ou ou ou ou*," which has a considerable resemblance to the cry of the wolf, a circumstance which induced the Latins to give it the name of *ulula*, which comes from *ululare*, to howl or cry like the wolf."

PROPAGATION.—According to Montagu, it breeds in the hollows of trees, sometimes in barns, prepares very little nest, or even deposits its eggs on the decayed wood. M. Temminck states that it lays its eggs in the deserted nests of buzzards, crows, and magpies. According to the former, the eggs are two, rarely three; while the latter makes them four or five. They are pure white, elliptical, at an average an inch and eleven-twelfths long, an inch and seven-twelfths across.

The young are at first of a dull yellowish-grey colour. The Rev. Mr W. T. Bree states in *London's Magazine*, vol. i. p. 179, that this bird is in the habit of feeding its young with live fish. "Some years since several young owls were taken from the nest, and placed in a yew tree in the rectory garden here (Allesley Rectory, near Coventry). In this situation the parent birds repeatedly brought them live fish, bull-heads (*Cottus Gobio*) and loch (or loach, *Cobites barbatula*), which had doubtless been procured from the neighbouring brook, in which these species abound. Since the above period, I have, on more than one occasion, found the same fish, either whole or in fragments, lying under the trees on which I have observed the young owls to perch after they have left the nest, and where the old birds were accustomed to feed them." Mr Bree having invited the readers of the *Magazine* to endeavour to explain in what manner the owl contrives to capture fish, a Norfolk correspondent "humbly suggests the probability of there being a luminous appearance in the eyes of the owl, by which the fish are enticed within the reach of its beak or claws. Fishing by torch-light," he continues, "is practised in some countries: is it likely that it could have derived its origin from a consideration of this kind?" Not in the least.

PROGRESS TOWARDS MATURITY.—The young birds of both sexes after their first moult resemble the old; in other words, there is very little difference in the colours of the young and the adult; but at a certain age, not yet determined by observation, the colours become different, and such as I have already described. In

this state individuals are, as might be expected, much more uncommon.

REMARKS.—This species, like many others, has been described as several. Willughby gives a good account of it under the name of "Strix Aldrovandi, Anglicè the Common Brown or Ivy Owl." Then, in its grey dress, he describes it as "Strix cinerea, the Grey Owl;" and again as *Ulula Aldrovandi*, the Grey Owl. Linnæus gives the grey bird, which however he describes as ferruginous, under the name of *Strix Aluco*, the red under that of *Strix stridula*. Latham's *Strix stridula* is the brown, his *Aluco* the grey, but he doubts if the two be distinct. Montagu, an observer of birds, and not merely a closet ornithologist, and describer of skins, is certain that the brown owl, or grey-coloured, is the same as the tawny owl, or brown bird. He states that he has killed both from the same nest, and considers the tawny or reddish-brown bird as the ordinary state, the grey the variety. "The young birds are also some tawny, others brown." In describing the tawny owl, he states that "the plumage of the sexes is exactly alike, but the female is most commonly less tawny, in which state it has been made a distinct species." M. Temminck considers the grey bird to be the old male, the brown or ferruginous birds the female and young of both sexes; and his successors generally follow him, always endeavouring to keep free of inconsistency while they have evidently no decided views on the subject. For my part, I have learned from observation that the ferruginous or brown birds are both male and female, and that the young in the

first and second plumage are also ferruginous. Not having been able, however to procure recent grey birds, I can only conjecture that they are old individuals, and whether M. Temminck be correct in stating that they are old males only remains to be determined. Some authors prefer the specific name *Aluco*, others *stridula*; and this might form a subject of keen discussion. The best way of settling the matter is to unite them: *Aluco* is as good a generic name as *Ulula*, *Noc-tua*, *Syrnium*, or any other; and I defy the whole ornithological world to shew me a more happy union.

The names by which this species is known or has been described in Britain are very numerous: Brown Owl, Tawny Owl, Beech Owl, Grey Owl, Ivy Owl, *Aluco* Owl, Wood Owl, Screech Owl, Howlet, Jenny Howlet, *Cumhachag*, *Cailleach-oidche*, &c.

Strix Alyco. *Linn. Syst. Nat.* vol. i. p. 132.

Strix stridula. *Linn. Syst. Nat.* vol. i. p. 133.

Strix Aluco. *Lath. Ind. Ornith.* vol. i. p. 59.

Strix stridula. *Linn. Syst. Nat.* vol. i. p. 58.

Tawny Owl. *Mont. Ornith. Dict.*

Strix Aluco. *Temm. Man. d'Ornith.* p. 89.

Strix stridula. Ivy Owl. *Flem. Brit. Anim.* p. 57.

Tawny Owl. *Ulula stridula.* *Selby, Illust.* vol. i. p. 103.

Syrnium Aluco. Tawny Owl. *Jenyns, Brit. Vertebr. Anim.*
p. 93.

ALUCO TENGMALMI.

TENGMALM'S WOOD-OWL.

UPPER parts liver-brown, spotted with white ; throat brown ; tail with five rows of transversely elongated narrow spots ; lower parts yellowish-white, with longitudinal brown markings ; tarsi and toes covered with long soft downy feathers.

ADULT.—This species bears so strong a resemblance to the Passerine Hawk-Owl in size and colour, that the two might very readily be confounded by a superficial observer. It is therefore very probable that individuals of the Tengmalm's Wood-Owl have been mistaken for the Passerine ; and for this reason, although I cannot find any authentic account of more than one specimen procured in this country, I deem it expedient to allow it to rank as a British Bird. The specimen from which the following description has been taken is in the Museum of the University of Edinburgh, and was obtained from North America. I have identified it with two figures in Mr Audubon's unrivalled collection of drawings ; and believe it to be the same as Mr Selby's figure of Tengmalm's Owl, in Plate XXVI. of his Illustrations, although in it the spots of the tail are different, and the brown colour lighter. The bill is short, very deep, and strong ; the outline of the upper mandible is curved from the base, its ridge convex, as are the sides, the edges sharp and incurved anteriorly, the tip

very acute, and at its extremity perpendicular. The cere is short, and bare on its upper part. The lower mandible has the angle broad and short, the dorsal line slightly convex, the edges inflected, towards the end incurved, with a notch on each side close to the abruptly rounded tip. The tarsi and toes are covered with very soft downy feathers, the extremities of the latter with two scutella. The claws are slender, tapering, curved, compressed.

The nostrils are broadly elliptical, oblique, in the fore part of the cere, which bulges considerably behind them. The conch of the ear is proportionally as large as that of *Aluco stridulus*, and in so far as can be judged from a dry skin, precisely similar, only that the anterior operculum is not so prominent.

The facial disk is complete, and composed of radiating feathers having disunited barbs. The ruff is also complete, and composed of several series of narrow, slightly recurved, rounded, rather compact feathers. The plumage in general is full, very soft, and blended; the feathers broadly oblong and rounded. The wings are rather long, very broad, much rounded, their quills considerably decurved; the first five cut out on the inner web near the tip; the second, third, and fourth on the outer; the third primary is the longest, the fourth almost equal, the second four-twelfths of an inch shorter, the first equal to the seventh; the barbs of the outer web of the latter have their tips free and recurved; those of the second and third are similar towards the end. The tail is slightly rounded, of twelve broad, rounded, slightly decurved feathers. The soft, silky, full plumage of the tarsi and toes affords one of the

most distinctive characters of this species when compared with *Syrnia passerina*.

The bill is pale greyish-yellow, darker on the sides. The claws are yellowish-brown, their tips dusky. The general colour of the upper parts is a deep olivaceous brown, approaching to liver-brown; the feathers of the head have an oblong central white spot; those of the hind neck are similarly marked with larger spots; the scapulars have two large round spots near the end; and some of the dorsal feathers and wing coverts have single spots on the outer web. All the quills have marginal white spots on both webs; those on the inner much larger. On the tail are five series of transversely elongated narrow white spots. The disk is yellowish-white, anteriorly black, patched with brown behind. The ruff is also yellowish-white, mottled with black. The throat is brown; the general colour of the lower parts is yellowish-white, longitudinally streaked with brown, the central part of each feather being of the latter colour; some of the hypochondrial feathers have two white spots near the end. The tarsal and digital feathers are greyish-yellow, marked with faint transverse bars of brown, like those of *Syrnia funerea*.

Length to end of tail $11\frac{1}{2}$, to end of wings $10\frac{1}{4}$; wing from flexure $7\frac{1}{2}$; tail $4\frac{1}{2}$; bill along the ridge 1; tarsus $1\frac{1}{2}$; first toe $\frac{9}{12}$, its claw $\frac{5}{12}$; second toe $\frac{7}{12}$, its claw $\frac{7}{12}$; third toe $\frac{9}{12}$, its claw $\frac{8}{12}$; fourth toe $\frac{5}{12}$, its claw $\frac{5}{12}$.

REMARKS.—Although similar in appearance to *Syrnia passerina* this species is easily distinguished; 1st. by the great difference in the size of its auditory conch;

2dly, by its complete facial disks and ruff; 3dly, by the difference in the clothing of the toes; and, 4thly, by the greater depth of its brown colour. Mr Selby, who first introduced this species to the British Fauna, states that his specimen was killed near Morpeth in Northumberland. Mr Swainson's figure in *Fauna Boreali-Americana* is a good likeness.

The species is common to Europe and North America. Dr Richardson informs us that, in the latter country, it is strictly nocturnal; builds in pine trees, laying two eggs; and feeds on mice and beetles. M. Temminck says it occurs in Sweden, Norway, and Russia, as well as in Livonia and some parts of Germany, and occasionally appears in France, the Vosges, Jura, and the north of Italy. According to him, it nestles in the natural holes of pines, laying two pure white eggs; and feeds on mice, moths, beetles, and other insects, as well as sometimes on small birds.

Although this species is the *Strix funerea* of Linnæus's *Fauna Suecica*, that name has been given by him to a different species in his *Systema Naturæ*; and, to prevent confusion, I follow the practice of Temminck and others, who have adopted the name given by Gmelin.

Strix funerea. Linn. *Fauna Suecica*, p. 25.

Strix Tengmalmi. Gmelin's *Linn. Syst. Nat.* vol. i. p. 291.

Strix Tengmalmi. Lath. *Ind. Ornith.* vol. i. p. 65.

Chouette Tengmalm. *Strix Tengmalmi.* Temm. *Man. d'Ornith.* p. 94.

Tengmalm's Night-Owl. *Noctua Tengmalmi.* Selby, *Illustr.* p. 105.

Noctua Tengmalmi. Tengmalm's Owl. Jenyns, *Brit. Verteb. Anim.* p. 94.

Strix Tengmalmi. Tengmalm's Owl. Swains. and Richards. *Fauna Bor. Anim.* part ii. p. 94.

STRIX. SCREECH OWL.

BILL short, moderately stout, compressed towards the end, straight, with a curved tip : upper mandible mobile to a great extent, the cere large, bare above and towards the lower edges, feathered along the sides, the dorsal outline nearly straight to beyond the nostrils, then curved in the fourth of a circle, the ridge broad at the base, narrower anteriorly, convex in its whole extent, the sides sloping at the base, convex towards the tip, the edges soft and obtuse as far as the nostrils, being covered with skin continuous with that of the palate, then sharp and hard to the end, below the nostrils inflected, afterwards direct, the tip acute and at its extremity perpendicular; lower mandible straight, its crura narrow and flexile, the angle elongated, narrowly rounded, the short dorsal line slightly convex, the back rather broad and convex, the sides convex, but towards the base slightly concave, sloping outwards, and cerate, the edges soft and meeting those of the upper, until near the end, where they are sharp and inflected, their outline decurved and sinuate, with two shallow notches on each side, the tip rounded but narrow; the gape-line slightly sinuous, being a little decurved at the two extremities, with a broad sinus about the middle.

Mouth very wide; palate prominent, sloping upwards

at the sides, with a central and two lateral prominent soft lines, converging forwards, and having on their ridge minute soft papillæ directed backwards; upper mandible soft within until near the tip, and having an elevated central line with soft tubercles; lower deeply concave, with an obscure central ridge; the palatal slit, or aperture of the posterior nares, elliptical behind, anteriorly linear, the edges being in contact, its sides broadly covered with small papillæ directed backwards, and terminating behind in two rounded, edged, papillate lobes. Tongue narrow, fleshy, sagittate, and papillate at the base, its upper surface nearly flat, with a central longitudinal groove, its sides nearly parallel, its tip thin, bifid, the points acute, a small portion of the back horny, with a slight central groove. Aperture of the glottis without papillæ on the edges, but with three papillate lobes behind. Œsophagus very wide, thin, of nearly equal diameter throughout, the inner coat with numerous longitudinal folds, at its lower part the walls much thickened and studded with roundish glandules; above this part, the proventriculus, is a slight contraction. Stomach large, its muscular coat very thin, but with distinct fasciculated fibres, the central tendons thin and small, the middle coat rather thin and tough, the inner thin very soft and even. Pylorus extremely narrow, being closed by a rim from the middle coat, and without valvular protuberances. Intestine slender, larger at the commencement, and continuing of nearly the same diameter about a fourth of its length, then gradually contracting to the cæca, which are of the same diameter at their commencement, gradually enlarge, and are rounded at the extremity;

the rectum at its termination much enlarged and funnel-shaped.

Nostrils medial, lateral, large, oblique, somewhat ovate, in the fore edge of the cere, with a tough soft membrane above, and having internally a ridge curved backwards from the inner edge. Eyes very large, slightly mobile, obliquely situated; eyelids with ciliary fringes of small distantly barbed feathers, and broad papillate thin margins, which are discontinued at the two canthi; both eyelids equally mobile. Aperture of the ear very large, subrectangular, oblique, with an upper and a lower somewhat elevated margin, and a large, anterior, erect, somewhat semicircular, operculum, extending on each side of the aperture, nearly rectilinear above, and beset with feathers. The conch extends from the base of the bill below to over the eye.

Head very large, broad behind, somewhat triangular, flattened and sloping above, the sides flattish and sloping forwards; neck short, slender, but seeming extremely thick on account of the great mass of feathers; body slender, deeper than broad, much compressed behind. Legs rather long, moderately stout; tibiæ proportionally long, but muscular; tarsi of moderate length, rounded, covered with small downy feathers; toes short, covered above with transverse series of small scales, between which are adpressed bristles, with a few scutella at the end, tuberculate, and covered with flattened papillæ beneath, the third and fourth connected by a very small basal membrane, the first shortest and admitting of much lateral motion, the fourth next in length, and capable of being placed at a right angle to the third, which is scarcely longer than the second; claws long,

curved, tapering, extremely acute, rounded above, convex on the sides, very narrow, and grooved beneath, that of fourth toe largest, of the rest nearly equal, of the middle toe transversely cut or serrated on its inner narrow thin edge.

Plumage extremely soft and downy. Face with two complete facial disks, composed of circular series of weak, slender, slightly recurved feathers, having remote barbs; surrounding which is a ruff formed of several rows of linear or spatulate incurved feathers, having the barbs loose, but closer at their rounded recurved extremity. Feathers of the forehead concealed by the ruff and disks; bill also partially concealed; feathers of the head and neck narrow, the latter very long, of the back broader and rounded, of the lower parts moderately long and almost entirely downy; an elongated tuft on the femur externally; the feathers of the tibia short, of the tarsus very short and small, of the toes reduced to the flattened bristle-like shafts, there being no down, or scarcely any, at their base. Wings long, very broad; primary quills ten, very broad, with slender shafts, the outer a little incurved towards the end, all entire on both margins and rounded, the first with the barbs of its outer web free and curved outwards, the second longest, the first and third slightly shorter; secondary quills fifteen, slightly decurved, rounded, the three inner short and more feeble. Tail short, decurved, even, of twelve broad rounded feathers with feeble shafts.

Such is the structure of the birds of this genus, so far as I have described it; and how admirably accordant it is with their mode of life, let any one judge who

is in some degree acquainted with both. Their large eyes, having extremely contractile irides, their highly developed auditory apparatus, their extremely acute claws, their long, broad, elastic, and downy wings, fit them for the stealthy nocturnal life of plunder which they lead. Their flight is extremely buoyant, as might be expected from so light and slender a body, and such expanded wings. Their neck is extremely mobile, which is the more necessary in birds whose eyeballs have little motion, although, being directed obliquely forwards, they give more precision to the aim, as the object of pursuit is seen with both. A principal use of the very large and elongated tail of the hawks, seems to be to break their fall when they come at full speed upon an object on the ground; and the reason why the tail of most owls, and of those of this genus in particular, is so short and feeble, may be that their downy elastic wings, and extremely bulky and light plumage, prevents them from falling with a force which they cannot instantaneously break without the use of a very large tail.

Let any one contemplate the expanded wing of a screech-owl, as I at this moment do, and he must feel how utterly inadequate human ingenuity and power are to the construction of so admirable an instrument of silent, gliding, buoyant, and rapid flight. Nay, how infinitely insignificant do all man's boasted works become, when compared with a tuft of down from the abdomen of an owl!—and how much blinder than that bird is when oppressed by the glare of the mid-day sun, are they who cannot see in all things the forming power and upholding care of an omnipresent Deity!

In our contemptible self-sufficiency, we are ever aiming at disposing the creations which have emanated from the infinite intellect, according to rules resulting from our own most imperfect comprehension of them. "Deus creavit, Linnæus disposuit," was the blasphemous and absurd inscription of a medal designed to commemorate the exploits of an ignorant creature, who, however much penetration and sagacity he may have shewn, assuredly never obtained more than a most dim and partial glimpse of the relations by which the works of God are connected.

The generic character given above is taken from the different varieties of the common screech-owl found in North America, Europe, Asia, and New Holland; although, what refers to the digestive canal, has been taken exclusively from that of specimens obtained in Scotland.

STRIX FLAMMEA.

THE COMMON SCREECH-OWL, OR BARN OWL.

BILL yellowish-white ; toes with four scutella, claws blackish-grey ; the general colour of the upper parts light reddish-yellow, variegated with minutely mottled ash-grey, and small black and whitish spots ; facial disks and lower parts white, the latter with small dusky spots. Young of the same colours, darker above.

MALE.—The Barn Owl is, in respect to colouring, one of the most beautiful birds of the family to which it belongs, and in form might be said to be elegant, were it not for the disproportionate size of its head. The proportions are those given in the generic character, and there is nothing specifically remarkable in the texture of the plumage.

The œsophagus, which is as already described, has a length of four and a half inches. The stomach, when collapsed, is an inch and a quarter in its greatest diameter ; when distended, three inches. In the latter state it is nearly orbicular, but compressed ; the largest of the two central tendons is eight-twelfths across. The cardiac and pyloric orifices are nearly a quarter of an inch apart ; the latter is encircled with a rim, which renders its diameter extremely small. The intestine immediately below the pylorus has a diameter of four and a half twelfths, and continues of that width for

eight or ten inches, when it gradually contracts to the insertion of the cœca, where its diameter is one-twelfth and a half. The cœca, which are two inches and a quarter long, are, at their commencement, of the same diameter as the intestine, and scarcely enlarge for nearly an inch, but then greatly dilate, and near their rounded termination have a diameter of three-twelfths, the membranes by which they are attached to the intestine being also about three-twelfths in breadth. The cloaca, which is funnel-shaped, is, when distended, nearly an inch in diameter. The whole length of the intestine is twenty-three inches, and the cœca come off at the distance of three inches from its extremity. The liver is very large, of two nearly equal lobes; the gall-bladder large, its duct entering about six inches below the pylorus.

The bill is yellowish-white, the cere and inside of the mouth pale flesh-colour; the iris black; the margins of the eyelids dark brown; the scales of the toes dusky; the claws dark purplish-grey. The facial disks are white, with a large brownish-yellow spot before the eye; the ruff reddish-yellow over the bill and along the sides of the head, white behind, and below towards the bill slightly tipped with brown. The general colour of the upper parts is light reddish-yellow, beautifully variegated with ash-grey, each feather having its extremity of the latter colour, minutely undulated or dotted with darker, and having near its tip a small oblong whitish spot, accompanied by one or two smaller brownish-black spots. The quills are of the general colour, minutely dotted, the primaries with four indistinct bars of brown, and having more than half the breadth of

their inner webs white; the secondaries similar, but with their tips, and nearly the whole of their inner webs white. The tail is also marked with four bars, the lateral feathers almost entirely yellowish-white. The whole lower surface is of the most beautiful pure white, interspersed with faint dusky spots, of which there is one near the tip of most of the feathers of the breast and sides.

Length to end of tail $13\frac{1}{2}$ inches, to end of wings 14; extent of wings 36; wing from flexure $11\frac{1}{2}$; tail 5; bill along the back $1\frac{1}{2}$, along the edge of lower mandible $1\frac{1}{2}$; tarsus $2\frac{5}{12}$; hind toe $\frac{1}{2}$, its claw $\frac{8}{12}$; second toe $1\frac{1}{4}$, its claw $\frac{9}{12}$; third toe $1\frac{6}{12}$, its claw $\frac{6}{12}$; outer toe $\frac{9}{12}$, its claw $\frac{7}{12}$.

FEMALE.—The female is considerably larger, but resembles the male in colour, although with less yellow and more grey on the upper parts, and the markings generally darker. In an individual examined on the 2d July 1835, the intestines were as described above, two feet in length. The ovary contained numerous eggs, varying in size from that of a grain of mustard seed or less, to that of two-twelfths of an inch in diameter. I counted a hundred and seventy-five, and there were, I believe, several more, probably about ten.

Length 15 inches; extent of wings 38; wing from flexure $11\frac{1}{2}$; tail $5\frac{1}{2}$; bill along the back $1\frac{8}{12}$; tarsus $2\frac{1}{2}$; middle toe $1\frac{6}{12}$, its claw $\frac{8}{12}$.

The description of a recently killed, perfect, and very beautiful adult female, presented to me, on the 3d Oc-

tober 1835, by Mr James Wilson, author of Illustrations of Zoology, and other works, is as follows:—

Bill flesh-coloured, a small portion of the tips only yellowish-white; cere and inside of the mouth also flesh-coloured; iris black; edges of eyelids and of nyctitant membrane blackish-brown; scales of the tarsi purplish-brown; scutella and claws dark purplish-grey; lower surface of toes dull greyish-yellow. The facial disks white, with a brownish-red patch anterior to the eye. The inner feathers of the ruff all round are white, the rest of a beautiful buff, those of its lower third tipped with brownish-black. The small feathers of the head between the ruff are also of a shining buff-colour. The upper parts are light reddish-yellow, variegated with ash-grey, which on the hind neck and back is the prevailing tint, when the feathers are closely laid, although it occupies only a small portion of the end of each, which is minutely mottled with greyish-white and dark greyish-brown, and has along the centre from two to five spots of dark brown and whitish. The wings have less grey; the primary quills are mottled at the end, the secondary more or less over their outer webs; there are five faint bars of brownish-grey mottlings on the outer, and greyish-brown spots on the inner webs; all the quills are pure white on three-fourths of the breadth of their inner webs. The tail is more distinctly marked with the same number of dark grey bands; the inner webs, excepting the two middle, and the outer webs of the two lateral, white. The sides and fore part of the neck are of a most delicate pale buff; the rest of the lower parts, including the under surface of the wings and tail, white; some of the feathers of

the sides have two small dark spots towards their extremities, and a few of the lower wing-coverts are similarly marked, the outer having only one spot.

In this individual, the œsophagus was four and a half inches long, its internal longitudinal rugæ very distinct. The stomach, which was distended with food, was of a broad oval form, two inches and three-eighths in length, one inch and three-eighths across. Its muscular coat was very thin but distinct; one of the central tendons measured five-eighths by five-twelfths, the other six-eighths by five-twelfths. The pylorus had on one side a roundish knob projecting from its thickened margin. The intestine was nineteen feet long, at its upper part five-twelfths in diameter, at the smallest near the cœca two and a half twelfths. The cœca, which came off at the distance of two and a half inches from the anus, were two inches and two-twelfths in length, for an inch had a uniform diameter of two-twelfths, but then enlarged into an obovate sac five-twelfths in its greatest diameter.

Length to end of tail 15 inches, to end of wings $15\frac{1}{2}$; extent of wings 38; wing from flexure $11\frac{3}{4}$; tail 5; bill along the back $1\frac{1}{2}$, along the edge of lower mandible $1\frac{1}{2}$, breadth of gape 1; tarsus $2\frac{4}{12}$; hind toe $\frac{7}{12}$, its claw $\frac{9}{12}$; second toe $1\frac{1}{4}$, its claw $\frac{1}{12}$; third toe $1\frac{4}{12}$, its claw $\frac{1}{12}$; fourth toe $\frac{9}{12}$, its claw $\frac{1}{12}$; diameter of eye $\frac{7}{12}$; larger diameter of aperture of ear $\frac{4}{12}$, smaller $\frac{9}{12}$; length of operculum $1\frac{1}{12}$, its height $\frac{9}{12}$.

VARIATIONS.—Individuals apparently full grown differ considerably in colouring, although all agree in the principal characters of the plumage. The bill is some-

times of an ivory or bony white, often tinged with yellow. The facial disks are sometimes all white, more frequently with a patch of dull yellowish-red before the eye. The ruff also is sometimes white, sometimes with the tips of its feathers yellowish-brown or buff, and in some cases the tips of the upper part near the bill are of the latter colour, while those of the lower part are dark brown. The colours of the back vary in the proportion of yellow and grey, there being much more of the latter in some individuals. The lower parts are sometimes pure white, frequently pure white with a slight pale dusky spot near the tip of each, and sometimes with a larger and darker spot; sometimes, however, they are tinged with yellow.

HABITS.—The barn owl is pretty generally distributed in England and Scotland, but appears to be more frequent in the former country. It is by far the most numerous species of our owls, but does not occur in the wilder and bleaker districts, nor in the north-western isles. It reposes in old buildings, barns, the steeples of churches, towers, crevices of rocks, and sometimes in trees in unfrequented places. During the day it stands nearly erect, with its feathers drawn close together, in some recess from which the direct rays of the sun are excluded. If disturbed and forced from its retreat at this time, it flies in a wavering and undecided manner, as if it were undetermined which way to proceed; and on such occasions, or even when perched in an open place, it is liable to be followed or surrounded by small birds of different species, which seem to be attracted by some instinct, the object of which is

not understood. "No bird," says Mr Slaney, "attacks the owl, in the day-time, with greater fierceness than our blue titmouse; buffeting its venerable adversary, erecting its feathers, screaming for aid, and in every way expressing its impotent rage."

Towards night, when the shades of darkness begin to envelope the earth, and the nocturnal quadrupeds and insects come abroad, when the bat on leathern wing flutters over the stream, or wends his winding way along the avenue, the barn owl, roused by hunger, and glad to embrace the earliest opportunity of stretching his downy wings, leaves his roost, and proceeds with slow and silent flight over the fields and meadows. Now, like a meteor he sweeps over head; but although not ten yards distant, no sound is heard from his pinions. Mark his progress as he speeds along on outspread wings, now moving with regular flappings, now sailing along in a direct line, and now curving with inclined body. See, an object has attracted his notice, and he hovers over the bank. Down he drops in an instant, and having doubtless clutched some unlucky mouse, off he goes rejoicing. You hear his shrill hoarse scream, but now the darkness hides him from your sight, and when we fall in with him again he will probably be found prowling over the farm-yard, or around the buildings.

In the fields, and along the hedges, it procures mice, shrews, and sometimes small birds. In the stomach of one from Peterhead, presented to me by my friend Mr Alexander Brand, in May 1835, I found besides the usual mass of hair enclosing numerous bones of glires, including several skulls, the entire skull of a

lark, which it no doubt had caught when the bird was reposing among the grass. Mr Selby says it swallows its prey "whole, and without any attempt to tear it in pieces with its claws." If this be true, the Peterhead owl must have had a marvellous gullet. Most persons who have described this bird, and among others Montagu, state that it preys on shrews; but I had been disposed to doubt this alleged fact for some time, never having found in its stomach the head of an animal of that genus, although I had observed those of different species of small glires. The owl mentioned above as having been presented to me by Mr Wilson, satisfied me as to Montagu's accuracy, for in a great mass of hair and bones contained in its stomach I found along with two skulls of *Arvicola agrestis*, four of a species of shrew. Mr Jenyns, on what authority I know not, says it "rejects the shrew." Some authors allege that it breaks the bones of its prey before swallowing it, but this is not probable, for one seldom finds broken bones in the pellets, which are curiously formed in the stomach, the sharp teeth and small bones, which might be supposed to be extremely apt to injure the soft and delicate inner coat of that organ, being wrapt up in a dense layer of hair. Like other owls, it is also said to prey on lepidopterous insects and beetles.

While flying, it now and then utters a harsh scream, and when perched emits a hissing noise. When approached in its retreat, it also hisses, snaps its bill, throws its body forward, and erects its feathers; and if wounded so as to be unable to fly, uses the same action.

PROPAGATION.—The Barn Owl nestles in old buildings, churches, or barns, sometimes among ivy on old walls, in the crevice of a rock, or in the hollow of a tree. The nest is composed of twigs and straws rudely put together. The eggs, which are four or five, are of a roundish form, smooth, pure white, an inch and a half or a little more in length, and about an inch and a quarter across.

The young, which are at first covered with white down, are very voracious, and, according to authors, are long before they are able to fly. It would appear that this species has several broods in the year, for I have had the young fully fledged in the end of June, and nests with eggs have been found very late in autumn.

YOUNG FLEDGED.—Bill and inside of the mouth pale flesh-colour; iris black; scutella and claws pale purplish-brown. The inner edge of the claw of the middle toe, which is at first entire, is at this period marked with several transverse slits towards the end. It may here be remarked, that the young of the gannet, until able to fly, have the edge of the same claw, as well as the edges of the bill, entire, whereas they are serrate in the adult. It would, therefore, be interesting to observe the claws at different periods in those birds which have them serrate or pectinate. The facial disks are dull white, with an orange-brown spot before the eye; the ruff white, its tips at the lower part reddish. The general colour of the upper parts is pale reddish-yellow, mottled with grey and brown, in the same manner as in the adult; the quills and tail of a lighter yellow,

tinged with grey and thinly mottled, the latter with faint indications of bars ; the lower parts white. When able to fly, individuals measure about twelve inches in length.

PROGRESS TOWARDS MATURITY.—The young being already so like the old, very little change takes place as the birds advance in age.

REMARKS.—This species is said by authors to be generally distributed over Europe, excepting the most northern countries, and to occur in Asia, New Holland, and North America. The skins which I have seen from the latter country were generally larger than those of individuals killed with us ; and as the barn owl of the United States has the stomach, according to Mr Audubon, elongated, and of a deep gamboge-yellow, while its tarsi are proportionally longer, it may ultimately turn out to be a different species. The stomach of ours is not yellow, but pale flesh-coloured, and when distended is circular.

Whether the barn owl be the most typical bird of the family or not, I leave to those who deal in types and circles to determine. It is a bird no doubt perfect in its adaptation to the circumstances in which it is placed, as is every other.

This species is known in different parts of the country by the names of Barn Owl, Screech Owl, Hissing Owl, Church Owl, White Owl, Yellow Owl, Howlet, Hoolet, Gillihowter, Cailleach-oidhche gheal (White night-bag).

Strix flammea. *Linn. Syst. Nat.* vol. i. p. 133.

Strix flammea. *Lath. Ind. Ornith.* vol. i. p. .

Barn Owl. *Mont. Ornith. Dict.* vol. i. p. 60.

Chouette Effraie. *Strix flammea.* *Tomm. Man. d'Ornith.* p. 91.

Aluco flammeus. Barn Owl. *Flem. Brit. Anim.* p. 57.

Barn or White Owl. *Strix flammea.* *Selby, Illustr.* vol. i. p. 99.

Strix flammea. White Owl. *Jenyn's Brit. Vertebr. Anim.* p. 92.

ULULA. TUFTED-OWL.

BILL short, moderately stout, compressed towards the end : upper mandible mobile to a great extent, the cere large, bare above and towards the lower edges, feathered along the sides, the dorsal outline slightly curved from the base, towards the end decurved, the ridge broad at the base, narrower anteriorly, convex in its whole extent, the sides sloping at the base, convex towards the tip, the edges soft and obtuse as far as the nostrils, being covered with skin continuous with that of the palate, then sharp and hard to the end, below the nostrils inflected, afterwards direct, the tip acute and at its extremity descending obliquely ; lower mandible straight, its crura narrow and flexile, the angle elongated, wide, rounded, the very short dorsal line slightly convex, the back convex, as are the sides, the latter towards the base slightly concave, sloping outwards and cerate, the edges soft and meeting those of the upper until near the end, where they are sharp and inflected, their outline decurved, and with a slight sinus on each side, the tip obliquely truncate ; the gape-line slightly sinuous, being a little decurved at the two extremities, with a broad sinus about the middle.

Mouth very wide ; palate prominent, sloping upwards

at the sides, with a short central and two lateral prominent lines, converging forwards; upper mandible within soft until near the tip, and having an elevated central line; lower deeply concave; the palatal slit narrow-elliptical behind, anteriorly linear. Tongue small, narrow, fleshy, sagittate and papillate at the base, its upper surface with a central groove, its tip thin and slightly bifid. Aperture of the glottis papillate behind, œsophagus very wide, thin, of nearly equal diameter throughout, the inner coat smooth and glistening, at its lower part the walls much thickened and studded with roundish glandules. Stomach large, its muscular coat very thin, but with distinct fasciculated fibres, the central tendons thin but rather large, the inner coat thin and even. Pylorus closed by a thin margin. Intestine of moderate thickness, larger at the commencement and continuing of nearly the same diameter about a fourth of its length, then gradually contracting to near the cœca; which are of considerable length, and gradually enlarged into an oblong rounded bag; the rectum wider, and at the end much enlarged and funnel-shaped.

Nostrils medial, lateral, large, oblique, oblong, in the fore edge of the cere, with a tough soft membrane above, and having internally a ridge curved backwards from the inner edge. Eyes very large, obliquely placed; eyelids with ciliary fringes of small distantly barbed feathers, and broad papillate thin margins, which are discontinued at the two canthi; both eyelids mobile. Conch of the ear extremely large, extending from the base of the lower mandible to over the middle of the eye so as to form a semicircle. There is an an-

terior operculum in its whole length, and a broad membranous margin behind, both beset with recurved feathers. The aperture of the meatus is elliptical, in the lower part of the conch.

Head very large, short, very broad behind, somewhat triangular, flattened and sloping above, the sides flattish and sloping forwards; neck short, slender, but seeming extremely thick on account of the great mass of feathers; body short, slender, deeper than broad, much compressed behind. Legs short, moderately stout; tibiæ proportionally long, but muscular; tarsi short, and with the toes covered with feathers having disunited barbs; two scutella at the end of the toes, of which the first is very short and admitting of much lateral motion, the fourth next in length, the third longest, and much longer than the second; claws slender, long, curved, tapering, extremely acute, rounded above, compressed, the sides convex, the lower surface of the first rounded, of the middle one obliquely flattened with a dilated inner edge, of the rest narrow and slightly grooved.

Plumage extremely soft, full. Facial disks very large, complete, their feathers with loose barbs; the ruff complete. Bill partially concealed by bristly feathers. There is a tuft of elongated feathers on each side of the head over the eye. The feathers in general are oblong and rounded, those of the abdomen downy, of the legs with soft disunited barbs. Wings very long and broad, rounded; primary quills broad and rounded, the second longest, the first about the length of the fourth, the first slightly cut out on the

inner web close upon the tip. Tail rather short, slightly decurved, of twelve broad, rounded feathers.

The birds of this genus in external appearance resemble those of *Aluco*, but have the head much smaller, its fore part much narrowed by the disks which almost meet upon it. In the latter respect they more resemble *Strix* than any other genus. Their wings are longer than those of *Aluco*, and their outer primaries differently proportioned. Our own species are among the most characteristic, and to them may be added *Strix ascalaphus*, *Str. africana*, and *Str. leucotis* of authors, together with several other species. Were the ideas of writers correct with respect to the characters indicative of the habits of owls, the birds of this genus ought to be strictly nocturnal. The contrary, however, is the case with at least one species, *Ulula brachyotus*. It is this genus which seems to be most nearly allied to *Circus*, the females of which bear a considerable resemblance in their colouring to the owl just named.

ULULA OTUS.

THE MOTTLED TUFTED-OWL, OR "LONG-EARED
OWL."

Tufts of about twelve feathers, projecting an inch beyond the plumage of the head; the upper parts light reddish-yellow, spotted and finely undulated with brown and greyish-white; the lower marked with oblong brown streaks and faintly undulated; the facial disk whitish in its anterior half, pale yellowish-brown behind, the eye half surrounded by dark brown. The young with the facial disk yellowish-brown, the colours otherwise nearly similar.

MALE.—This species of owl is remarkable for the minute mottling of its plumage, and the elongated tufts of feathers on the crown of its head, which it raises or depresses at will. The body is deeper than broad, much compressed behind; the neck rather short and slender; the head very large and somewhat triangular. The bill is short, rather stout; the upper mandible with its dorsal line slightly curved from the base, towards the inner end decurved, the ridge broad at the base, narrowed anteriorly, convex in its whole extent, the sides sloping at the base, convex towards the tip, the edges soft and obtuse as far as the nostrils, being covered with skin continuous with that of the palate, then sharp and hard to the end, below the nostrils inflected, after-

wards direct, the tip acute and at its extremity descending obliquely. The cere is of moderate length, feathered on the sides, its margin forming a convex curve before the nostril, below which it passes directly to the edge of the mandible. The lower mandible is straight, its crura narrow and flexile, the angle elongated, wide and rounded, the very short dorsal line slightly convex, the back and sides convex, the latter toward the base slightly concave, sloping outwards and cerate, the edges soft and meeting those of the upper until near the end, where they are sharp and inflected, their outline decurved and with a single slight sinus on each side, the tip obliquely truncate.

The mouth is very wide; the palate prominent, sloping upwards at the sides, with a short central and two lateral prominent lines, converging forwards. The palatal slit is narrow-elliptical behind, anteriorly linear. The tongue is small, narrow, fleshy, sagittate and papillate at the base, its upper surface with a central groove, its tip thin and slightly bifid. The œsophagus is very wide, of nearly uniform diameter, it being about ten-twelfths across when dilated, slightly contracted at the commencement of the proventriculus, which is half an inch long, with thickened walls, the glandules large and very distinct; its inner coat smooth and glistening, like a serous membrane; its entire length five inches. The stomach is nearly globular, a little flattened, an inch and three-fourths in diameter; its tendons distinct, and nearly half an inch in diameter, the fibres of its muscular coat rather coarse. The intestine, which is twenty-two inches long, is wider at its upper part, where it has a diameter of three-twelfths, gradually di-

minishes to a twelfth and a half, but is again a little enlarged towards the cœca, which are two inches and a half long, only one-twelfth in diameter for an inch and a half, the remaining part formed into an oblong, rounded sac, half an inch across at its widest part. The rectum is two inches and a half long; the cloaca funnel-shaped, and one inch in diameter. The liver is very large, of two nearly equal lobes; the gall-bladder large and globular. In another individual, the intestine was only eighteen inches long.

The eyes are very large, the eyelids furnished with broad, thin margins, and ciliary fringes of small distantly barbed feathers, both eyelids equally mobile. The nostrils are medial, lateral, large, oblique, oblong, in the fore edge of the cere, with a tough soft membrane above, and having internally a ridge curved backwards from the inner edge; the aperture of the ear large, elliptical, the concha extending from over the eye to the base of the lower mandible, curved, with an anterior, and a posterior flap, beset with recurved feathers.

The tarsi, which are feathered, are short and stout. The toes also are short and feathered, the third and fourth connected at the base by a short web; the first shortest and admitting of much lateral motion, the third longest, the second and fourth nearly equal. On all the toes are two terminal scutella.

Claws long, curved in the fourth of a circle, tapering, extremely acute, rounded above, convex on the sides, very narrow beneath, the first and second rounded, the rest flat; that of the fourth toe smallest, of the first slightly larger, those of the other toes much larger and

nearly equal, that of the middle toe with a thin sharp edge, not serrated.

The plumage is extremely soft and downy. The facial disks are complete, and composed of circular series of weak, slender, slightly recurved feathers, having remote barbs; surrounding which is a ruff formed of several rows of oblong incurved feathers, having the barbs close. The feathers of the forehead are apparent between the ruffs, although that part is very narrow; the bill is partially concealed by the plumage; the feathers of the head and neck are oblong, the latter very long, of the fore part of the back ovate and rounded, of the hind part short, broad, and entirely downy, of the lower parts long and downy; the feathers of the breast and sides are rather more compact than those of the back; on the tibia they are short, extremely soft and silky; on the tarsi and toes, small, soft and blended.

The wings are long and broad; the primary quills very broad, rounded, with slender shafts, the outer a little incurved towards the end, the first sinuate on the inner web near the end, the second very slightly so; the second longest, the third a little shorter, the fourth a little longer than the first; the secondary quills, which are fifteen, are slightly decurved, broad and rounded, the three inner shorter and more feeble. The outer quill in its whole length, the second towards the end, and the first alular feather, have the barbs disunited and recurved at the points; and the inner webs of the quills and tail-feathers, are covered with an extremely soft down. The tail is rather short, slightly decurved, slightly rounded, of twelve broad, rounded feathers, having feeble shafts.

The bill is brownish-black, the cere and inside of the mouth flesh-coloured; the claws black. The irides are orange. The colouring of the plumage may be described as buff, mottled and spotted with brown and greyish-white. Of the circle of loose feathers surrounding the eye, the anterior half is whitish, the tips black, the posterior buff. The anterior auricular ruff is whitish, tipped with black, but is generally concealed; the posterior is bright red, mottled with brownish-black. The upper part of the head is minutely mottled with whitish, brownish-black, and light red. The two tufts on the temples, of which the largest feathers are an inch and a half in length, are light reddish towards the base, brownish-black in the central part to the end, the inner edge white, mottled with dark-brown. The general colour of the upper parts is buff, variegated with brown and whitish-grey, minutely mottled or undulatingly barred. The first row of coverts is tipped with white on the outer web; the edge of the wing and the outer margin of the first alular feather are also white. The alula and primary coverts are greyish-brown barred with darker; the quills and scapulars pale grey, barred with dark-brown, and having more or less buff towards the base of the outer web, that colour conspicuous on the six outer primaries. The tail is barred and mottled in the same manner, the bars very narrow, ten on the middle and eight on the outer feathers. The lower parts are in general similar to the upper, but with more buff, and fewer spots, each feather with a long dark brown streak and several irregular transverse bars. The legs and toes are pure buff. The lower surface of the wing is yellowish-white, a

few of the coverts with a brown spot; the quills banded with brown towards the end. The lower tail-coverts have a narrow central brown line. Three-fourths of the length of all the feathers from the base are downy, and of a deep bluish-grey colour.

Length to end of tail $14\frac{1}{2}$ inches, to end of wings $15\frac{1}{2}$; extent of wings 36; wing from flexure $11\frac{1}{2}$; tail $5\frac{3}{4}$; bill along the back $1\frac{5}{12}$, along the edge of lower mandible $1\frac{5}{12}$; tarsus $1\frac{1}{2}$; hind toe $\frac{1}{2}$, its claw $\frac{8}{12}$; second toe 1, its claw $\frac{9}{12}$; third toe $1\frac{1}{4}$, its claw $\frac{9}{14}$; outer toe $\frac{2}{3}$, its claw $\frac{7}{12}$.

FEMALE.—The female is considerably larger than the male, has the facial disk lighter, and the upper parts, especially the wings, with a greater proportion of greyish-white; but in other respects is similar in colouring.

Length to end of tail 16 inches, to end of wings 17; extent of wings 40; wing from flexure 12; tail $5\frac{3}{4}$; bill along the back $1\frac{1}{4}$, along the edge of lower mandible $1\frac{1}{4}$; tarsus $1\frac{7}{12}$; hind toe $\frac{7}{12}$, its claw $\frac{8}{12}$; second toe $1\frac{1}{12}$, its claw $\frac{10}{12}$; third toe $1\frac{1}{4}$, its claw $\frac{9}{12}$; outer toe $\frac{2}{3}$, its claw $\frac{7}{12}$.

VARIATIONS.—This species, in so far as I know, exhibits very few remarkable variations. The older the birds are the purer are their tints, and the more tinged with grey are the upper parts.

HABITS.—The Mottled Tufted-owl is a constant resident, and occurs sparingly in most of the wooded parts of England and Scotland. It resides chiefly in

woods, where I have seen it resting by day, when it seems to be averse from motion. It is in fact nocturnal and crepuscular in its habits, and feeds chiefly on mice and shrews; but I have not examined the stomachs of a sufficient number of individuals to enable me to ascertain the extent of its feeding. A young individual which I kept for some time, perched by preference on a narrow or rounded surface, or the edge of a flat one, stood at first with the body inclined, afterwards nearly erect, and in the latter posture slept, keeping its neck, not retracted, but rather extended, its feathers drawn close, and its tufts recumbent. When perched on a narrow surface, such as the back of a chair, it placed the outer toe behind; but when on a flat surface directed it outwards; on all occasions it applied the sharp points of its claws against the wood or other substance, which induces me here to remark that one might expect to find the fine tips of those organs more frequently injured than they are. When irritated, it raised its plumage, threw its body forward, and uttered a sharp cry. It seized its food with its bill, if large transferred it to one of its feet, but if otherwise, retained it in the bill. In flying, it carried a small object in its bill, but a larger in its foot. It had the power of closing one eye while the other remained open, and when placed in a strong light, frequently drew the nyctitating membrane over the lighted eye, while the other remained unsheathed, although in general it winked with both simultaneously. The irides contracted unequally, according to the degree of light; but it did not dislike the strongest glare, and perched on a gas-burner or on a chair near the window as readily as elsewhere.

When perched at night it sometimes emitted a clicking noise, like that of a spring, with its bill; but when provoked, it neither hissed nor snapped, but merely uttered a shrill plaintive tremulous cry, or succession of short notes, erecting its tufts at the same time.

PROPAGATION.—It nestles in trees, choosing the nest of a rook or magpie, which it lines with wool, or other soft materials. The eggs are from three to five, elliptical, pure white, an inch and nine-twelfths in length, an inch and four-twelfths across. It lays in April, and the young take about six weeks before they are able to fly.

YOUNG FLEDGED.—The young are at first covered with down of a light yellowish-grey colour, barred with faint brown. There are two conspicuous tufts on the top of the head. The first feathers are singularly soft and downy. When fully fledged, they are coloured like the old birds, but are much darker. The iris is orange; the bill brownish-grey, horn-coloured at the tip; the claws greyish-brown; the wings and tail are more decidedly barred, and the buff on the wings is of a richer tint.

PROGRESS TOWARDS MATURITY.—After the first moult, the colours are as in the old bird, only the lower parts are more barred, and their longitudinal markings broader and darker. In old individuals, the lower parts are pure buff, without undulating bars, their longitudinal spots narrow, and those on the lower tail-coverts nearly obliterated.

Of a male individual after the first moult the dimen-

sions were as follows :—Length to end of tail 14; extent of wings 36; bill along the back $1\frac{1}{4}$; tarsus $1\frac{5}{8}$; first toe $\frac{7}{8}$, its claw $\frac{7}{8}$; second toe $\frac{10}{8}$, its claw $\frac{8}{8}$; third toe $1\frac{9}{8}$, its claw $\frac{8}{8}$; fourth toe $\frac{9}{8}$, its claw $\frac{6}{8}$.

REMARKS.—According to authors, this species is common in most parts of the continent of Europe. It also occurs in Africa and North America. The manners of many birds differ considerably, according to the nature of the country which they inhabit; and thus, although the long-eared owl breeds with us in trees, yet in the northern parts of America, according to Dr Richardson, it lays its eggs “sometimes on the ground, at other times in the deserted nests of other birds in low bushes.”

This species is known in Britain by the names of Horn Owl, Horned Owl, Long-eared Owl, and Common Eared Owl.

Strix Otus. *Linn. Syst. Nat.* vol. i. p. 132.

Strix Otus. *Lath. Ind. Ornith.* vol. i. p. 53.

Long-eared Owl. *Mont. Ornith. Dict.*

Hibou Moyen Duc. *Strix Otus.* *Temm. Men. d'Ornith.* p. 102.

Otus vulgaris. Long Horn-Owl. *Flem. Brit. Anim.* p. 56.

Long-eared Owl. *Otus vulgaris.* *Selby, Illustr.* vol. i. p. 85.

Otus vulgaris. Long-eared Owl. *Jenyns, Brit. Vertebr. Anim.*
p. 91.

ULULA BRACHYOTUS.

THE STREAKED TUFTED-OWL, OR "SHORT-EARED OWL."

TUFTS of three feathers, projecting about half an inch beyond the plumage of the head; the upper parts light reddish-yellow, broadly streaked and barred with deep brown; the lower marked with narrow brown streaks; the facial disk whitish in its anterior half, pale yellowish-brown behind, the eye completely surrounded by brownish-black. The young similar to the adult.

MALE.—The Streaked Tufted-Owl greatly resembles the preceding species in form and size, as well as in the tints of its plumage, but is easily distinguished by attending to the circumstances noted in the above specific character. The body deprived of feathers is oblong, anteriorly deeper than broad, much compressed, its greatest depth two inches and a quarter, its greatest breadth at the shoulders two, its smaller diameter behind the ribs only ten-twelfths. The head is very large, and somewhat triangular; the neck rather short and slender. The bill is short and stout; the upper mandible with its dorsal line slightly curved from the base, bulging a little on the cere, towards the end decurved, the ridge broad at the base, narrowed anteriorly, convex in its whole extent, the sides sloping, slightly convex towards the tip; the edges soft and obtuse as far as the nostrils, then sharp and hard to the

end, below the nostrils inflected, afterwards direct, the tip acute, and at its extremity nearly perpendicular. The cere is rather long, feathered on the sides, its margin forming a convex curve before the nostril, below which it passes directly to the edge of the mandible. The lower mandible is straight, its crura narrow and flexible, the angle wide and rounded, the short dorsal line convex, as are the back and sides, the latter toward the base slightly concave, sloping outwards and cerate, the edges soft and meeting those of the upper until near the end, where they are sharp and inflected, their outline decurved, and with a single slight sinus on each side, the tip obliquely truncate.

The mouth is very wide; the palate prominent, sloping upwards at the sides, with a short central and two lateral prominent lines, converging forwards. The palatal slit is narrow-elliptical behind, anteriorly linear. The tongue is small, narrow, fleshy, sagittate and papillate at the base, its upper surface with a central groove, its tip thin and slightly bifid. The œsophagus is wide, of nearly uniform diameter, it being nearly an inch across when dilated, slightly contracted at the commencement of the proventriculus, which is half an inch long, with thickened walls, the glandules interposed between its coats large and distinct; its entire length five inches. The stomach is nearly globular, a little compressed, an inch and three-fourths in diameter; its tendons unequal, one five and a half, the other four and a half twelfths in diameter; the fibres of its muscular coat rather coarse. The intestine, immediately below the pylorus, which is extremely contracted by means of a thin margin, dilates to the diameter of

four and a half twelfths, continues so for some inches, gradually contracts to less than two and a half twelfths, and so continues to near the cœca; which are three inches and a quarter long, one-twelfth and a half in diameter at their commencement, gradually enlarge, and terminate in an oblong sac, the greatest diameter of which is four-twelfths. The rectum is two inches long; the cloaca funnel-shaped, and one inch in diameter. The entire length of the intestine is twenty-six inches. The liver is very large, of two nearly equal lobes; the gall-bladder large and globular.

The eyes are very large, the eyelids furnished with broad thin margins, and ciliary fringes of small distantly barbed feathers. The nostrils are medial, lateral, large, oblique, oblong, in the fore edge of the cere; the aperture of the ear large, elliptical, the concha extending from over the eye to the base of the lower mandible, curved, with an exterior and an interior flap, beset with recurved feathers.

The tarsi, which are feathered, are short and stout. The toes also are short and feathered, the third and fourth connected at the base by a short web; the first shortest and admitting of much lateral motion, the third longest, the second and fourth nearly equal. On the hind toe are two terminal scutella, on the rest three.

The plumage, although more compact than that of the mottled tufted-owl, is still extremely soft and blended. The facial disks are complete, and composed of a circular series of weak, slender, slightly recurved feathers, having remote barbs; surrounding which is a ruff formed of several rows of oblong incurved fea-

thers, having their barbs close. The feathers of the head are apparent between the ruffs, although that part is very narrow; the bill is partially concealed by the plumage; the feathers of the head and neck are oblong, the latter very long; of the fore part of the back elongated and oblong; of the hind part short, broad, and entirely downy; of the lower parts long and mostly downy. On the tibiae they are short, extremely soft and silky; on the tarsi and toes small, soft, and blended. The wings are long and broad; the primary quills very broad, rounded, with slender shafts, the outer a little incurved towards the end; the first sinuate on the inner web near the end, the second very slightly so; the second longest, the third little shorter, the fourth a little shorter than the first; the secondary quills, which are fifteen, are slightly decurved, broad and rounded, the three inner shorter and more feeble. The outer quill in its whole length, the second towards the end, and the first alular feather, have the barbs disunited and recurved at the points; and the inner webs of the quills and tail-feathers are covered with an extremely soft down. The tail is rather short, slightly decurved, slightly rounded, of twelve broad, rounded feathers, having feeble shafts.

The bill is brownish-black, as are the claws; the irides bright yellow, tinged with red. The eye is surrounded by a ring of brownish-black, much broader behind. The anterior half of the disk is white, the tips black, the posterior yellowish with black shafts. The anterior auricular ruff is white, the posterior yellowish, each feather with an oblong brownish-black spot. The upper part of the head, the hind neck, and the fore

part of the back are buff and dark brown, the central part of each feather of the latter colour. The tufts are similar, but with the pale inner part broader. The scapulars and wing-coverts are spotted and banded in large patches with the same colour, and many of them have a large spot of yellowish-white on the outer web near the end. The edge of the wing is whitish. The alula and primary coverts are dark brown, the outer webs pale buff at the base; the quills buff, with a narrow space along the shafts, the ends, and two or three broad bands, dark brown. The tail is buff, with five broad bands of brown, the tip yellowish-white. The lower parts are pale buff, whitish behind, the neck with oblong, the breast and sides with linear dark brown streaks, the legs and feet unspotted. The upper tail-coverts are yellowish-brown faintly margined with darker. The lower surface of the wing is yellowish-white, a few of the coverts with a brown spot, the quills broadly banded towards the end. Three-fourths of the length of all the feathers from the base are downy, and of a deep bluish-grey colour.

Length to end of tail 15 inches, to end of wings 17; extent of wings 38; wing from flexure $11\frac{3}{4}$; tail $6\frac{1}{2}$; bill along the back $1\frac{5}{8}$, along the edge of lower mandible $1\frac{5}{8}$; tarsus $1\frac{7}{8}$; hind toe $\frac{7}{8}$, its claw $\frac{6}{8}$; second toe $1\frac{1}{8}$, its claw $\frac{10}{8}$; third toe $1\frac{5}{8}$, its claw $\frac{9}{8}$; fourth toe $\frac{8}{8}$, its claw $\frac{6}{8}$.

FEMALE.—The female is little larger than the male, which she resembles in colour; but the brown of the upper parts is lighter, the lower parts are of a deeper tint, and their longitudinal streaks broader.

Length to end of tail 16 inches, to end of wings 18; extent of wings 40; wing from flexure 13; tail $6\frac{1}{4}$; bill along the back $1\frac{4}{12}$, along the edge of lower mandible $1\frac{4}{12}$; tarsus $1\frac{6}{12}$; first toe $\frac{8}{12}$, its claw $\frac{2}{12}$; second toe 1, its claw $\frac{10}{12}$; third toe $1\frac{4}{12}$, its claw $\frac{10}{12}$; fourth toe $\frac{6}{12}$, its claw $\frac{8}{12}$.

VARIATIONS.—I am not aware of any remarkable variations exhibited by this bird.

HABITS.—All that I know of the habits of this species, from my own observation, is very little. I have met with it only in winter and spring, at which season I have seen it in the neighbourhood of Edinburgh. It is sometimes found by day among the grass, its favourite station being the margin of a ditch or brook, where it probably watches for amphibious glires or shrews. When disturbed, it flies off with a buoyant unsteady flight, shoots along in various directions, now high, now low, inclining its body alternately to either side, very much in the manner of some gulls, *Larus canus* for example. It seems to prey by day, and may be seen gliding over the meadows or moors somewhat in the manner of the hen-harrier.

On the 25th December 1835, having gone out to procure some birds of which I was in need, I fell in with an owl of this species about a mile from Edinburgh. It had been standing by the side of a ditch, and on my approach flew off, when I sent a shot after it, apparently with no effect, possibly because the missiles were of the smallest kind. It alighted at the distance of about two hundred yards, by the edge of a

turnip field, but flew before I got near it, ascending to a considerable height, and hovering about, very much in the manner of a gull. A rook presently made up to it, and endeavoured to peck at it, but the owl took care to keep beyond reach, by rising in a spiral direction. Another rook then attacked it, and afterwards two more; but the owl still kept above them, and continued to ascend until it had gained a great elevation, when the rooks one by one left it, and went about their business. The owl sailed a long time in circles, and at length flew off. It was a clear sunny day, but the bird seemed as little incommoded by the light as its sable enemies, which it evidently excelled in its powers of flight.

Mr Low, in his *Fauna Orcadensis*, says it is very frequent in the hills of Hoy, one of the Orkney islands, where it builds its nest among the heath. "It is impudent," he continues, "in breeding time, sometimes catching up chickens from the doors. I have likewise seen it in chase of pigeons in day-light, which is not ordinary with the owl-kind. In a nest I found in Hoy were the remains of a moor-fowl, two plovers, besides the feet of several others, and the birds, two in number, ready to fly. The nest was in a large heath-bush, made without any art; intolerably fetid by reason of the heat of the weather, which had putrified some part of the provisions; and which was still increased by the dung, &c. of the birds, which the parents did not seem so attentive to remove as I have observed the smaller birds upon such occasions."

Montagu states that it arrives in October and departs in March; "is never observed to perch on a tree,

but generally hides itself in long grass or fern, and seems partial to open, barren situations. When disturbed it flies a little way, and lights again on the ground. In dusky weather it will prey by day, and sometimes fly at small birds as well as mice."

Mr Selby has, in autumn, "often met them in turnip fields, but never seen them in plantations; nor do they ever," he continues, "attempt to perch upon a tree. Five or six of these birds are frequently found roosting together; from which circumstance, it is probable that they migrate in families."

Dr Richardson, who found it in the fur countries of North America, states that it is often seen hunting for its prey in the day-time. "Its principal haunts are dense thickets of young pine-trees, or dark and entangled willow clumps, where it sits on a low branch, watching assiduously for mice. When disturbed, it flies low for a short distance, and then hides itself in the heart of a bush, from whence it is not easily driven. Its nest, formed of withered grass and moss, is placed on a dry spot of ground; and, according to Mr Hutchins, it lays ten or twelve small, round, white eggs:"—a goodly number, truly, for an owl.

PROPAGATION.—It has been seen that this species breeds in Orkney: Sir William Jardine has also found it breeding in Dumfriesshire, and in his edition of Wilson's American Ornithology, he has inserted a note, which, with other interesting particulars, contains the following statement. "On the extensive moors at the head of Dryfe, a small rivulet in Dumfriesshire, I have, for many years past, met with one or two pairs of these birds, and the accidental discovery of their young first

turned my attention to the range of their breeding; for, previous to this, I also held the opinion, that they had commenced their migration southward. The young was discovered by one of my dogs pointing it; and, on the following year, by searching at the proper season, two nests were found with five eggs. They were formed upon the ground among the heath; the bottom of the nest scraped until the fresh earth appeared, on which the eggs were placed, without any lining or other accessory covering. When approaching the nest or young, the old birds fly or hover round, uttering a shrill cry, and snapping with their bills. They will then alight at a short distance, survey the aggressor, and again resume their flight and cries. The young are barely able to fly by the 12th of August, and appear to leave the nest sometime before they are able to rise from the ground. I have taken them, on that great day, to sportsmen, squatted on the heath like young black-game, at no great distance from each other, and always attended by the parent birds. Last year, 1831, I found them in their old haunts, to which they appear to return very regularly; and the female, with a young bird, was procured; the young could only fly for sixty or seventy yards."

Mr Swainson states, as one of the characteristic qualities of his "systematic or closet naturalist," that, "ascending higher and higher in his generalizations, he concentrates the facts, spread into an octavo volume of *zoological anecdotes* and field remarks, within the compass of a few pages." At this rate he would condense the above observations respecting the habits and propagation of the *Ulula brachyotus* into three lines at most:—Arrives in Britain in October, departs in

March; but some remain and breed, nestling on the ground, and laying five eggs. Feeds on mice and birds; flies like a gull; never perches on trees; and expresses its surprise when it sees a closet naturalist in the fields, by erecting its tufts, screaming and snapping its bill. I have wandered beyond my limits, however, not being a true systematic naturalist.

REMARKS.—This species, according to authors, is found in most parts of Europe and North America. Its head is by some described as small, which it certainly is when compared with that of *Aluco stridulus*, although it is still very large compared with that of any extra-strigine bird. Many authors, deceived by the tufts, unite the species of this genus with those of the next; but the head in the latter is of a different form, being broad anteriorly, and their ears are much smaller, being, as to size, more allied to those of the genus *Aluco*.

The Streaked Tufted-Owl has a goodly variety of aliases, like most other owls, it being known in Britain by the names of Hawk-Owl, Woodcock-Owl, Short-eared Owl, Mouse-Hawk, and described by the selected authorities under the following appellations.

Strix Ulula. *Lath. Ind. Ornith.* vol. i. p. 60.

Strix brachyotos. *Lath. Ind. Ornith.* vol. i. p. 55.

Short-eared Owl. *Mont. Ornith. Dict.*

Hibou brachiote. *Strix brachyotos.* *Temm. Man. d'Ornith.* p. 99.

Otus brachyotos. Short Horn-owl. *Flem. Brit. Anim.* p. 56.

Short-eared Owl. *Otus Brachyotos.* *Selby, Illustr.* vol. i. p. 88.

Otus brachyotos. Short-eared Owl. *Jenyns, Brit. Vertebr. Anim.* p. 92.

BUBO. EAGLE-OWL.

BILL short, robust, very high, compressed towards the end; upper mandible with the cere large, the dorsal line slightly convex as far as the edge of the cere, then curved in the fourth of a circle, the ridge broad and convex along the cere, afterwards narrowed but convex, the sides sloping at the base, towards the end nearly erect and convex, the edges soft at the base, sharp and inflected towards the end, having a slight festoon anterior to the curvature, the tip strong, sub-trigonal, acute; lower mandible straight, its crura short and widely separated, the angle broad and rounded, the short dorsal line slightly convex, the back broadly convex, the edges soft, and meeting those of the upper mandible until towards the end, where they are sharp and inflected, their outline nearly straight, towards the end decurved, with a distinct sinus on each side close to the abrupt tip.

Mouth very wide; palate depressed in the centre, and sloping upwards at the sides, with a central and two lateral papillate soft ridges converging forwards; upper mandible soft within until near the tip, and having an elevated central tuberculated ridge; lower deeply concave, with a slight central ridge; the aperture of the posterior nares short, elliptical, anteriorly

linear, the edges papillate, and with a broad space on each side covered with reverted papillæ, and terminating behind in a rounded papillate margin. Tongue oblong, fleshy, sagittate and papillate at the base, its upper surface with a medial longitudinal groove, its sides nearly parallel, its tip retuse or slightly emarginate, the lower free surface horny. Aperture of the glottis with three papillate lobes behind. Œsophagus very wide, thin, without remarkable dilatation, the inner coat with numerous longitudinal folds; the proventriculus studded with cylindrical glandules, and dilated below. Stomach large, its muscular coat very thin, its fibres distinct and fasciculated, the central tendons small and thin, the inner surface smooth. Pylorus closed by a rim or sphincter, without valves. Intestine larger at the commencement, and continuing of nearly the same diameter about a fourth of its length, then gradually contracting to near the cœca, which are of the same diameter at their commencement, gradually enlarge, and are oblong and rounded at the extremity; the rectum much larger, and terminating in a globular cloaca.

Nostrils large, oblique, roundish or broadly elliptical, their cavity divided by an oblique soft ridge from the upper edge. Eyes extremely large, fixed, obliquely situated; eyelids with thin crenate margins, discontinued at the two canthi, and ciliary fringes of short, widely barbed feathers; the upper eyelid much larger. Conch of the ear about half the height of the head, elliptical, fringed with feathers, and having the large elliptical oblique aperture of the meatus in its lower part; no bare space connected with the conch.

Head very large, broad, flattened above, anteriorly narrowed; neck short, rather strong, seeming extremely thick on account of the great mass of feathers covering it; body short, stout, deeper than broad, much narrowed behind. Legs rather short, very strong and muscular; tibiæ of moderate length, very thick; tarsi short, rounded, closely covered with blended feathers; toes short, stout, covered above with short close plumage, beneath with soft conical papillæ, the first very short and admitting of much lateral motion, the fourth next in length and capable of being placed at a right angle to the third, which is considerably longer than the second; claws curved, long, tapering, very acute, rounded above, convex on the sides, their lower surface narrow and presenting a flattened groove, excepting that of the third, which is broad, with an expanded inner edge.

Plumage very soft and full. Facial disks incomplete, the space above the eyes being occupied by feathers of a different texture; the feathers of the disks oblong, slightly curved, with loose barbs; those directed forwards and partially concealing the bill longer and stiffer; the ruff inconspicuous and incomplete, its feathers spathulate and slightly curved. The feathers in general are oblong and rounded; those of the thorax and abdomen downy, but completely covered by two large bunches from the fore part and sides of the thorax; of the legs, tarsi, and toes, short and blended. Wings long, very broad, much rounded; primary quills broad and rounded, the first three sinuate on the inner web, the first four slightly cut out on the outer, the third longest; secondary quills from fifteen to eighteen,

very broad, rounded. Tail of moderate length, broad, rounded, of twelve rounded decurved feathers.

The above characters are taken from three species, *Bubo maximus*, *B. virginianus*, and *B. bengalensis*, excepting those referring to the intestinal canal, which have been furnished exclusively by the first species. The birds of this genus differ greatly in appearance from those of the genus *Ulula*, their head, although equally furnished with tufts, being larger and much broader, especially at its fore part. The size and form of the ear and bill are also different. In fact, they are more allied to some of the *Syrniæ* and *Alucones* than to the *Ululæ*. They are all birds of large size, and seem among the owls generally to be analogous to the eagles in the Falconine family. The bill of the great eagle-owl is very similar in form to that of the osprey, and its feet recal those of the golden eagle. One species, the largest of the genus, may be considered entitled to rank as a British bird. My description of this bird is taken from a splendid specimen presented to me alive, expressly for the purpose, by my generous friend Mr Audubon, the American ornithologist.

BUBO MAXIMUS.

THE GREAT EAGLE-OWL.

TUFTS of about nine feathers, projecting upwards of two inches beyond the plumage of the head; the upper parts variegated with dark brown and light reddish-yellow; the lower of the latter colour, marked with longitudinal blackish-brown spots, and very numerous transverse undulating lines; the facial disk greyish-brown, obscurely barred; the bill and claws greyish-blue at the base, black at the end.

ADULT FEMALE.—The Great Eagle-Owl, *Le Grand Duc* of the French, is distinguished from all the British birds of the family by its great size and peculiar markings. In the former respect the Snowy Owl may equal it, but that species is white and tuftless, whereas the Eagle-Owl is mottled with light reddish-yellow and dark brown, and has two very conspicuous tufts on the head. This species is, moreover, remarkable among the owls by its robust constitution. Its body is muscular and firm, the thorax about six inches deep, and nearly of the same breadth anteriorly, although the abdomen is only three inches across. The neck is short, and rather stout, the head very large, short, flattened above, its sides sloping forwards, so that the transverse axis of the eye forms an angle of about 15° with the median line of the head. The wings are large,

the limbs remarkably powerful, and proportionally as robust as those of the Golden Eagle.

The bill is short, deep, and very strong; the cere rather long, and almost entirely bare, although concealed by the neighbouring feathers. The upper mandible has its dorsal line curved from the base, slightly so along the cere, the ridge broad and convex on the cere, narrowed and convex in the rest of its extent, the sides sloping and flat at the base, convex towards the end, the edges soft and straight to the middle, then sharp and curved, with a slight festoon, the tips very strong, acute and perpendicular. The lower mandible has the angle broad and rounded, the crura wide, the short dorsal line slightly convex, the back broad and rounded, the sides convex, the edges inflected and sharp towards the end, with a deep sinus or notch close to the rounded tip. The mouth is an inch and three-quarters wide. The palate is rather convex, but with a central depression corresponding to the tongue, having a medial and two lateral soft ridges, on which are small papillæ directed backwards. The upper mandible is flattened within, with a soft tubercular central ridge, its horny part concave. The aperture of the posterior nares is short, broadly oblong, anteriorly linear; on each side is a large space covered with papillæ, terminating behind in a curved papillate edge. The tongue is fleshy, oblong, an inch and two-twelfths in length, deeply sagittate and papillate behind, its posterior half also papillate; it has a medial groove, the tip is slightly emarginate, and its free inferior part is covered with a horny plate.

The whole length of the intestinal canal is five feet

two inches. The pharynx is two inches wide. The œsophagus, which is nine and a half inches long, is, vaguely speaking, nearly uniform in diameter, and instead of being dilated anterior to the furcula, as in the eagles and hawks, is narrowest there. At its lower part it gradually enlarges to form the proventriculus, which is completely encircled by roundish glands. The outer coat of the œsophagus is obscurely fibrous, the inner smooth, with longitudinal rugæ when not dilated. From the pharynx, the œsophagus contracts to a diameter of one inch and one-twelfth anterior to the furcula; the diameter of the proventriculus is one inch and five-twelfths. It opens widely into the stomach, so as to seem a part of it as much as of the œsophagus. The stomach is a large broadly elliptical, somewhat compressed bag, its largest diameter three and a half inches, its breadth two and a half. Its outer coat is composed of distinct fasciculated fibres, about half a twelfth in diameter, and separated by spaces of the same breadth. One of its tendons is nine-twelfths, the other ten-twelfths in diameter. The inner coat is smooth and even. The pylorus is nearly half an inch distant from the edge of the cardiac orifice. At the commencement, the intestine has a diameter of only two-twelfths, but it suddenly enlarges to nine-twelfths, and so continues to the entrance of the biliary and pancreatic ducts, at the distance of twelve inches from the pylorus; it then gradually diminishes to near the cœca, where its smallest diameter is four-twelfths. The cœca come off, one a little below the other, and are of the usual form in this genus, cylindrical for about half their length, then much enlarged, and at the extremity round-

ed. One is four and a half, the other five inches long; their diameter at the commencement is three-twelfths, being a little less than that of the intestine. From the cæca to the cloaca, a length of two and a half inches, the rectum has a diameter of about eight-twelfths. The cloaca is nearly globular, two inches and three-quarters long, its largest diameter two inches. The whole length of the intestine is forty-nine inches. The liver is not remarkably large, its two nearly equal lobes having a length of two inches and eight-twelfths, and a breadth of one inch and a half. The gall-bladder is nearly globular, being an inch and a half long, and an inch in diameter. Its duct is only eight-twelfths long. The pancreas is five inches long, and, as usual, lies in the first fold of the intestine.

The nostrils are very large, broadly elliptical, oblique, in the fore part of the cere, and are each divided into two cavities by a soft ridge proceeding from the upper edge backwards, their greatest diameter four-twelfths, the least two and a half twelfths. The eyes are extremely large, quite fixed in the orbits, and placed obliquely forwards. The diameter of the eye from one canthus to the other is an inch and a half, but that of the globe itself is two inches. The upper eyelid is very large; both have a thin bare crenate margin, which is discontinued at the two canthi. The inner part of the outer surface of both eyelids is bare, the outer feathered. The orifice of the lachrymal passage is extremely large, being two-twelfths in diameter; it is single, but communicating with it, at the distance of four-twelfths above, is another orifice, the canal of which is formed by a membrane stretched over the

angle between the eyelid and the nyctitant membrane.

The external aperture of the ear or conch is more than half the height of the skull, elliptical, nearly of the same form as that of *Aluco stridulus*, but differing in not having an elevated operculum, its margins being little raised. They are beset all round with short curved feathers in several series. The bottom of the conch is formed of the outer edge of the eyeball, and the corresponding part of the orbit, covered with skin. At its lower part is a large pad of adipose matter, behind which, and bounded posteriorly by an edged process of the occipital bone, is the meatus externus, which is oblique, elliptical, five-twelfths by three-twelfths. The external aperture or conch is an inch and one-twelfth long, its margins two-twelfths broad. There is no bare space above or below it.

The thighs are extremely short, the tibia also comparatively short and extremely muscular, the tarsus very short, rounded and feathered. The hind toe is very short and capable of being moved to either side; the fourth next in length and reversible, but ordinarily directed outwards; the third longest. All the toes have three large membranous terminal scutella. The third and fourth are connected by a short web. Their soles are padded and covered with large conical soft papillæ. The claws are very long, curved in less than a semi-circle, excepting the first, of which the outline is semi-circular; tapering, very acute, convex above and on the sides, with a broad concave groove beneath, excepting the third, which is there broad and flattened, with a dilated inner edge.

The plumage is very soft, full, and elastic. The facial disks are incomplete, extending only round two-thirds of the eye, leaving the upper part covered with shorter and softer feathers. The eyelids are fringed near the edge with short bristle-tipped feathers, having disunited barbs. The feathers at the base of the cere have strong shafts, and conceal the cere and nostrils. The forepart of the head is much broader than in the genus *Ulula*, and similar to that of *Aluco*. The ruff is inconspicuous and incomplete, extending only from a little above the ear to the chin, its feathers oblong and but slightly curved. On each side of the head, over and behind the eye, is a longitudinal series of nine elongated feathers, forming a tuft, which projects two and a half inches beyond the surface of the plumage. The feathers of the upper parts are oblong, rounded, with loose margins; those of the hind part of the back more downy. Those on the throat are downy; on the fore neck long and rather compact; on the thorax and abdomen downy, the latter longer; but these downy parts are entirely covered by two large bunches of very long soft feathers arising from the fore part and sides of the thorax. There is a similar bunch on the upper and outer side of the tibia. The tibiæ, tarsi, and toes, are covered with soft blended feathers. The wings are very large, extremely broad, and rounded. The primary quills are very broad, the first four cut out on the inner web near the tip, but the first and second only are abruptly so; the second, third, and fourth, are slightly cut out on the outer web. The first in its whole length, the second and third towards the end, have the barbs or filaments of the outer web free and

recurved at their extremities. The number of quills is twenty-seven. The third quill is longest, the fourth nearly equal, the first an inch and a half shorter than the second. The tail is broad, rounded, decurved, of twelve broad, rounded feathers.

The bill is black, tinged with greyish-blue, and paler at the base, its soft edges flesh-coloured, the cere dusky. The inside of the mouth bright flesh-colour, the fore part of the tongue paler. The iris is bright orange. The bare edges of the eyelids, and the margin of the nyctitant membrane, are dusky. The scutella are pale blue, edged with yellowish; the claws light greyish-blue at the base, changing to black towards the end; the soles are pale ochre or flesh-colour.

The facial disks are dull greyish-brown, being faintly barred with dusky and dull yellowish-red, their anterior part greyish-white with black shafts. The feathers of the eyelids are greyish-white, the anterior marginal feathers of the upper black; there is a spot of the same on the middle of the upper eyelid, which is conspicuous when the eye is closed. The feathers over the upper eyelid, and the long tufts, are brownish-black, the latter internally edged with reddish.

The general colour of the upper parts is reddish-yellow, spotted, barred, and minutely mottled with dark brown, the latter colour approaching to black on the fore parts, and becoming paler and tinged with grey behind. The hind neck is more tinged with red, and many of the feathers there have merely a central oblong brownish-black spot. The fore edge of the wing, the alula, and the primary coverts, are darker than the rest, having very little yellow. The quills are

broadly barred with brownish-black, the intervals of a beautiful yellowish-red, nearly pure on the inner webs, but on the outer thickly and minutely undulated with brown. The tail is similarly banded and mottled, its tints paler. The chin or space immediately under the crura of the lower mandible is white; below this is a transverse band of barred and mottled feathers continuous with the ruff; under which is a patch of white, intermixed with a few black spots. The fore part and sides of the neck are reddish-yellow, each feather with an oblong brownish-black longitudinal band, and transverse lateral undulations. The rest of the long feathers on the lower parts are similarly marked, but the central spot gradually becomes narrow and elongated, and on the lower feathers ceases, while the transverse narrow bars become more numerous and regular. The large tibial tufts are similarly marked. The concealed downy feathers of the breast and abdomen are paler, the anterior or upper without bars, the rest barred with dusky, as are the feathers of the tibiæ, tarsi, and toes; on the latter the bars are fewer, curved, and marginal. The lower surface of the wing is greyish-yellow, barred and dotted with dusky, as is that of the tail. The lower tail-coverts yellowish-red, and barred like the tibial tufts. The concealed or downy part of the plumage is dark greyish-blue.

Length to end of tail 26 inches, to end of wings 24; extent of wings 61; wing from flexure 20; tail 10; bill along the ridge $2\frac{5}{8}$, cere $1\frac{1}{2}$; depth of bill at base of cere $1\frac{1}{4}$, at fore edge of cere $1\frac{1}{8}$; edge of lower mandible $1\frac{9}{16}$; tarsus $2\frac{3}{4}$; first toe $1\frac{1}{4}$, its claw $1\frac{9}{16}$; second toe $1\frac{1}{2}$, its claw $2\frac{1}{8}$; third toe $2\frac{1}{8}$, its claw

$2\frac{1}{2}$; fourth toe $1\frac{3}{4}$, its claw $1\frac{6}{8}$. The weight of this individual, which was in good condition, was 7 lb. 4 oz.

HABITS.—According to authors, the Great Eagle-owl occurs in various parts of the continent of Europe. M. Temminck says it is very common in Russia, Germany, and Switzerland, less so in France and England. In the latter country it is indeed of extremely rare occurrence. Low considered it as a permanent resident in Orkney, and the assertion has been verified by Dr Neill; but from the very few instances of its appearance on the mainland of Britain that have been recorded, we must conclude that it is merely an occasional visitant there.

The individual presented to me by my friend Mr Audubon, and which I kept alive several weeks, was a very beautiful and most interesting bird. I do not marvel that the ancients should have selected this species to consecrate it to the goddess of Wisdom; for its representative in my possession had a most imposing appearance, and its conduct certainly did not tend to diminish the respect which one felt towards it when first introduced to its presence. As an emblem of prudence and sagacity, however, I should prefer the raven, which seems to me to be the most intelligent of all our native birds. Various qualities are attributed to different birds by every practised observer the moment he looks upon them. The cockatoo excites the idea of a vain fop, the gannet of a booby, the peregrine falcon of a ferocious plunderer, the sea-eagle of a powerful, cruel, and rapacious despot, the robin and wren of childhood and innocence. When you gaze upon the

raven, the adjutant, the golden eagle, or the eagle-owl, you perceive something in their aspect and demeanour that inspires a certain kind of respect; and although you may not feel inclined to make obeisance to these chiefs of their respective families, you acknowledge that they are worthy of the homage of their own kind.

The bird of which I speak, when a stranger was introduced to it, depressed its head, threw out its feathers by inflating its skin, opened its bill, stared with expanded pupils, and emitted at intervals a hissing sound, strongly resembling that of an offended cat. By these actions it no doubt expressed its dislike, apprehension, alarm, or defiance. All that came were received in the same manner, and certainly the bird was right, for all were its enemies. In this mood it would stand, inflated with anger, its wings partially raised, its large brilliant eyes glaring from the midst of the great mass of feathers, and following all your motions. In attending to its supposed enemy, it always moved its head directly towards him, and did not seem capable of casting a sidelong glance, or of being satisfied with seeing on one side only; in which respect it differed from the eagles and other falconine birds. If irritated still more, it snapped its bill at intervals, sometimes twice or thrice in rapid succession, and hissed vehemently. It then began to move its head to either side, in a singular and somewhat ludicrous manner, fixing its gaze on some particular spot, to which it flew for safety. If touched with a stick, it leaped aside with alacrity, and seized it in its bill. When gently treated, however, it would allow a per-

son to touch its head, although not without attempting to bite. It seemed to have a greater dislike to women and children than to men, although it saluted all indiscriminately with hisses. On remaining some hours in a room with it, I found it quite reconciled to my presence; and three times, while I was painting its portrait, it flew from its perch and alighted on the table before me.

When it observed an object which it thought it might capture, à cat for example, or a small bird, it stood erect on its toes, drew its feathers close, stretched out its neck, raised its tufts, and fixed its eyes so steadfastly on it, that it no longer heeded your presence, and could not be diverted even by pushing it with a stick. When sleeping, it also kept its feathers close, its neck erect, the tufts generally raised. At this time, when its body seemed scarcely thicker than its neck, it presented a complete contrast to the great ball of feathers which it displayed when irritated.

It generally perched on the highest place it could find, and preferred the top of a box, the back of a chair, or other similar stand, into which it inserted behind the tips of the claws of the first and fourth toes, those of the second and third being directed forwards and similarly bent. On a flat surface, however, the fourth or outer toe was not reverted, but directed outwards, and the claws were stretched out. It sometimes stood on one foot, and on a sufficiently broad place generally rested the whole tarsus. It seemed incapable of walking, and when it moved from one place to another, it was by leaping with the aid of its wings. On a carpet, however, it found difficulty even in this,

for, on rising, the tips of the claws frequently caught hold and tripped it. Having perched on a box over which were several folds of cloth, it seemed, in moving about, to have fancied some living object to be beneath, and pierced it with its talons a hundred times, dancing as it were upon it, throwing out its wings, occasionally crouching and pecking with its bill. In the same manner it bored a hair mattress all over. On one of these occasions it uttered a squeak like that of a small animal, the only sound, except hissing and clicking its bill, that I heard it emit. Having heated itself with the exercise, it stood panting a long while, much in the manner of a dog, the throat swelling at each hurried expiration. When perching on a narrow surface, it made great use of its large wings to steady itself; and often, when quietly perched, it spread out its wings and flapped them strongly for a minute or more. When roused from sleep, it sometimes yawned, stretched out and flapped its wings, and extended its legs in succession. It trimmed its feathers like other birds, but I never observed it applying to the uropygial gland for unguent. In scratching its cheeks or head, the only parts it could not reach with its bill, it used invariably the inner dilated edge of the middle toe.

The action of snapping or clicking is clearly produced by the bill. In performing it, the bird did not open its mouth beyond a quarter of an inch at most. The conch of the ear was not thrown open under any circumstances, so as to be exposed to view. The eyes formed an interesting subject of observation. The upper eyelid was very large, the lower narrow, so that, when asleep, the former covered more than two-thirds

of the eye. It frequently drew the nyctitant membrane over the eyes, but could gaze for a long time without winking in any shape. Generally both membranes were simultaneously employed, but sometimes only one; and I have seen it draw down the upper eyelid of one eye several times in succession, without moving that of the other. The iris, which was of a beautiful orange colour, was continually contracting and expanding. When it was irritated, or when looking intently on an object, it dilated the pupil, and when listless or dozing, with its eyes half closed, it contracted it. The eyes did not shine in the dark like those of a cat; nor did those of the mottled tufted-owl, which I kept alive for some time. Mr Audubon informs me that the eyes of no owls with which he is acquainted reflect any light in this manner. Their internal structure, in fact, shews that they cannot.

Having sketched it in three different attitudes, and observed its manners, I at length found it necessary to accomplish the object for which it had been presented to me by my friend. I therefore put a rope round its neck, gave it a sudden jerk, and, with the aid of another bimanous animal, strangled it in less than two minutes, and then divided the spinal cord with a pin. It struggled very little. On opening the eyes, which were closed, I observed that the iris had contracted so as to have a breadth of only one-twelfth of an inch.

Many particulars respecting its organization I must reserve for another occasion; because, in this volume, I have purposely restricted myself to the external parts, and the intestinal canal.

REMARKS.—The male, in so far as can be judged from specimens in museums, is much smaller. Not having had an opportunity of examining any other individual in a recent state, and not being disposed to eke out the present article by compilation, I shall merely add a few remarks.

The Eagle Owl, on being deprived of his skin and the great quantities of adipose matter that lie over and between the muscles, presents a very singular appearance. The enormous breadth given to the anterior parts by the pectoral muscles, the extreme narrowness of the loins, and the great development of the muscles of the thighs and legs, with the slender neck and disproportioned head, produce a figure at which one can hardly refrain from smiling, even were he as grave and dignified as a system-maker. The effect is produced, I believe, by the great contrast between the actual form of the bird and its outline, as defined by the surface of the plumage. I have dissected and drawn the greater part of the muscular system, which I intend to give in a larger and more solemn-looking book than the present.

In the mean time, I cannot refrain from once more remarking on the extreme absurdity of considering descriptions and figures of skins as constituting ornithological science. In his description of the present species, M. Temminck states that the bill and claws are horn-colour; and Mr Selby, that the base of the bill is pale yellowish-brown, the tip darker, the claws pale yellowish-grey. It is evident to me that these descriptions have been taken from dry skins merely; and I

think that authors err when they refrain from giving their sources of information. The bill and claws of the specimen described above, were at the base bluish-grey, towards the tip becoming darker, so as ultimately to be greyish-black. Again, according to M. Temminck, the female is "always larger, and has the plumage of a lighter tint; she has not the throat white." Mr Selby says that "the female is similar to the male bird, except in wanting the white upon the chin or throat, and is superior in size;" and Mr Jenyns, that "the female is rather larger than the male, and without the white throat." Now the bird which I have described was a female, as was shewn by the two hundred and odd germs in her ovary; and yet she had both the chin and a patch on the throat white. Assuredly, ornithological description is in much greater need of reformation than the British constitution, with the patching of which every body is so fond of meddling "in these enlightened times." As to the figures of this bird which I have seen, they are almost all ludicrous and contemptible caricatures. Indeed, I have seen no figures of birds, excepting those of "the Birds of America," and some wood-cuts, including those of the "Gardens and Menagerie of the Zoological Society," that did not indicate an utter incapacity in their authors for seizing the characteristic forms and expression of the originals.

The Great Eagle Owl has received various names, such as Great Horned Owl, Great Eared Owl, Great Owl, Athenian Owl, &c. It has been noticed, under the following names, by the authors whose synonyms I employ.

As an example of the inaccuracy of random assertions, I here quote two sentences from a work on British Birds. "An owl, in its plumage, looks a thick, stout, and even clumsy bird; but strip off the feathers, and it is really nothing. The great owl (*Strix bubo*), the size of which has been compared to that of the eagle, is not one-fourth of the weight." Compare this with the statement at pages 439 and 434. The weight of the most robust eagle I ever handled was 12 lb. 14 oz.; that of the smallest male 7 lb. 12 oz.; that of a female eagle-owl 7 lb. 4 oz.

Strix Bubo. *Linn. Syst. Nat.* vol. i. p. 131.

Strix Bubo. *Lath. Ind. Ornith.* vol. i. p. 51.

Great Eared Owl. *Mont. Ornith. Dict.*

Hibou Grand-Duc *Strix Bubo.* *Temm. Man. d'Ornith.* p. 100.

Great-horned or Eagle Owl. *Bubo maximus.* *Selby, Illustr.*
vol. i. p. 82.

Bubo maximus. Eagle Owl. *Flem. Brit. Anim.* p. 57.

Bubo maximus. Eagle Owl. *Jenyn's Brit. Vertebr. Anim.* p. 90.

SCOPS. OWLET.

BILL short, strong, compressed towards the end; upper mandible with its dorsal line curved from the base, its cere of moderate length, its sides sloping and slightly convex, its edges anteriorly sharp, its tip acute; lower mandible with the angle rounded, the dorsal line slightly convex, the edges decurved at the end, with a slight notch, the tip rounded.

Nostrils roundish, in the fore part of the cere. Eyelids without distinct ciliary fringes, and with broad thin margins. Aperture of the ear large, elliptical, in the lower part of an elliptical concha, having all round a slightly elevated margin beset with feathers.

Head large, broad and rounded, anteriorly narrowed; neck short. Legs rather short; tarsi slender, feathered at the upper part only, or in their entire length; toes short, bare, reticulate above, towards the end scutellate; claws slightly curved, tapering, acute, compressed, that of the middle toe with a dilated inner edge.

Plumage soft and full, more compact than in the other genera. Facial disks incomplete above the eyes; the ruff inconspicuous and incomplete. The feathers in general ovate and rounded, those of the abdomen downy, of the tibiae silky, of the tarsi small and short. Wings long, the third primary longest. Tail of mo-

derate length, slightly rounded, of twelve slightly decurved, rounded feathers.

In this genus I would place several small owls, some of them tufted, others not, which agree in having the small conchs of the genus *Syrnia*, and slender feet; the toes always, and part of the tarsus sometimes, bare. The tufted species, *Scops Aldrovandi* of authors, *Bubo nudipes* of Vieillot, and others, are in a considerable degree allied to the genus *Bubo*; while *Strix nudipes* of Vieillot, and *Strix portoricensis*, represent the other section. The species mentioned have a strong mutual resemblance even in the markings of their plumage. The genus *Scops*, therefore, according to my idea of it, is precisely intermediate between the genera *Bubo* and *Syrnia*.

SCOPS ALDROVANDI.

THE TUFTED OWLET.

HEAD with tufts of about twelve feathers; plumage undulatingly variegated with grey and brown, and marked with brownish-black lines; length about eight inches.

ADULT.—Not having seen a bird of this species alive or recently killed, I am obliged to have recourse to stuffed skins. The following description is from a specimen belonging to Mr Bushnan, Dumfries, and another in the Museum of the University of Edinburgh.

The head is broad and rounded, the wings long, the feet short, the tarsi slender, and covered with short compact feathers, the toes bare. The bill is short, strong, compressed towards the end; the upper mandible with its dorsal line curved from the base, its cere of moderate length, its sides sloping and slightly convex, its edges anteriorly sharp, its tip acute; the lower mandible with the angle rounded, the dorsal line slightly convex, the edges decurved at the end, with a slight notch, the tip rounded. All the toes have four scutella at the end, the rest of their upper parts being covered with scales. The claws are but slightly curved, compressed, acute, that of the middle toe with a thin dilated inner edge. The aperture of the ear is elliptical,

four-twelfths of an inch long. The nostrils are roundish, large, in the fore part of the cere.

The plumage is full, close, rather compact; the feathers in general ovate and rounded. The hypochondrial tufts, and those on the femurs, are very long; the feathers on the abdomen and tibia downy, on the tarsi short, rounded and compact. The wings are long, the quills all broad and rounded; the third primary longest, the second almost as long, the fourth next, the first intermediate between the fifth and sixth. The tail is of moderate length, very slightly rounded, of twelve nearly straight, broad, rounded feathers. On the sides of the head, beyond the eyes, are two large tufts of about twelve feathers. The facial disks are incomplete, being discontinued over the eyes. The ruff is inconspicuous, its feathers broad and but slightly curved.

The general colour of the plumage is light grey, tinged with yellowish-red on the fore part of the back, each feather with a central line of brownish-black, and transversely undulated with the same. The outer scapulars have a large white spot on the outer web near the end. The lower parts are lighter. The quills are banded and undulated; the primaries with conspicuous greyish-white spots on the outer web between the greyish-brown bands; their inner webs darker. The tail is similarly undulated and barred. The tarsal feathers are brownish-grey, with a central blackish-brown line on each.

Length to end of tail $8\frac{1}{2}$ inches; wing from flexure $6\frac{5}{12}$; tail $3\frac{9}{12}$; bill along the ridge $\frac{3}{4}$; tarsus 1; hind toe $\frac{5}{12}$, its claw $\frac{3}{12}$; second toe $\frac{7}{12}$, its claw $\frac{5}{12}$; third toe $\frac{9}{12}$, its claw $\frac{4}{12}$; fourth toe $\frac{5}{12}$, its claw $\frac{4}{12}$.

REMARKS.—According to authors, this beautiful little owl occurs in various parts of the continent of Europe, being stationary in the more southern, and appearing in the northern only accidentally or during its migrations. In France, Buffon states that they arrive in flocks about the same time as the swallows, and take their departure after them. He also states that they destroy great numbers of field-mice, but although they travel in large flocks, are rather rare and difficult to be procured. "Their colour," he says, "varies much according to age and climate, perhaps according to sex; they are all grey at first; among adults some are browner than others; the colour of the eyes appears to follow that of the plumage," varying from pale yellow to hazel.

Montagu introduced this species into the Fauna of Britain, on the authority of Mr Foljambe, of Osberton. The first specimens were shot in Yorkshire, and several others are stated to have been found in various parts of England.

Strix Scops. *Linn. Syst. Nat.* vol. i. p. 129.

Strix Scops. *Lath. Ind. Ornith.* vol. i. p. 56.

Strix Zorca. *Lath. Ind. Ornith.* vol. i. p. 56.

Strix Giu. *Lath. Ind. Ornith.* vol. ii. p. 36.

Little Horned Owl. *Mont. Ornith. Dict. Suppl.*

Hibou Scops. Strix Scops. *Temm. Man. d'Ornith.* p. 103.

Scops Aldrovandi. *Flem. Brit. Anim.* p. 57.

Scops-eared Owl. Scops Aldrovandi. *Selby Illustr.* vol. i. p. 92.

Bubo Scops, Nob! Scops-eared Owl! *Jenyns, Brit. Vertebr. Anim.* p. 91.

ADDITIONAL DESCRIPTIONS

AND

REMARKS.

ADDITIONAL DESCRIPTIONS.

HAVING completed my descriptions of the different species of Falconine and Strigine Birds that have been met with in Great Britain, in so far as I have been able to fill up the various compartments of the plan which I had in commencing sketched for my guidance, it now becomes necessary for me to revise the whole, correct the errors which I have committed, and add the observations which I have made since the different articles were printed. So many fresh specimens and bodies have of late been obtained by me, that I am enabled to add very considerably to the information contained in the preceding pages; and as the tide is still rapidly flowing, I trust I shall ere long be qualified to present to the public several anatomical essays, referring to the birds which form the subject of this volume. In the mean time, I here subjoin such particulars as I judge suited to the present occasion.

HALIAETUS ALBICILLA. THE WHITE-TAILED SEA-EAGLE. P. 53.

The cry of this bird I have described as resembling the syllables *kooluk, kooluk, klook, klook*, which is true enough; but, on attending more particularly to it, I have found it to be more correctly expressed by *klick, klick, klick*, or *queek, queek, queek*. It is shriller and sharper than that of the Golden Eagle, which I am enabled to state in consequence of having recently had an opportunity of comparing the two species in this respect.

When standing on a level surface, the White-tailed Sea-Eagle inclines its body forwards, and gathers up its large wings, allowing the secondary to project over the primary quills. When roosted on the edge of a rock, it stands more erect, and draws in its head, generally allowing its wings to hang by its sides. In moving to a short distance it leaps sidelong or directly, using its wings to assist it. If its prey be small, it holds it with one foot while eating it; if otherwise it generally stands upon it. Captive birds frequently catch in one foot, or in the bill, an object that may be thrown to them. The aspect of this species is less imposing than that of the Golden Eagle, its large yellow bill giving the head a less beautiful form, and its eyes seeming less brilliant than the brown ones of that bird. Yet, when in good condition, and in new plumage, it is a very beautiful bird. Dr Neill's eagle, mentioned at p. 80, and which has now (December 1835) completed its moult, is a bird that one might look at with delight

for hours together. The colour of its plumage is purplish-grey, tinged with brown, the edges of the feathers lighter. The anterior parts, especially the throat, fore neck, and edges of the wings, are paler. The quills and upper and lower tail-coverts are dark, and the tail is pure white. The bill is pale greenish-yellow, tinged with grey; the nearly bare space before the eye pale flesh-coloured; the eye brownish-yellow; the feet orange. On the first toe are three entire scutella, on the second three, on the third twelve, on the fourth six. When alarmed, it closes its feathers, stands high on its legs, stretches out its neck, and moves its head slowly in various directions. When uttering its cry, it keeps its body nearly horizontal, stretches its neck upwards, and throws its head a little backwards. The sounds certainly resemble the syllables queak, queak, queak, when heard near; but among the rocks they seem to be best represented by klook, or kooluk, or kleek, which may be owing to the reverberation of the sound.

AQUILA CHRYSÆTUS. THE GOLDEN EAGLE. P. 89.

Having recently been favoured by Mr Carfrae, Preserver of Animals, Edinburgh, with the inspection of a fresh eagle, the most robust that I have seen, I am enabled to add the following particulars respecting it to my description of the species.

This individual weighed 12 lb. 14 oz.

The bill measured two inches and nine-twelfths along the ridge, two inches and a-half along the edge of the

lower mandible; the cere ten-twelfths. The nostril elliptical, with two notches above. The upper mandible concave within, with a central ridge. The palate with two central soft papillate ridges; a transverse papillate flap on each side anterior to the narrow-elliptical aperture of the internal nares, of which the anterior part is linear, with minute papillæ on the edges. The tongue concave above, papillate, and sagittate behind, rounded, slightly notched. The aperture of the ear elliptical, five-twelfths in length.

The tibia seven and a half inches long, the tarsus four and a half. The first toe one inch and nine-twelfths long, its claw two inches and nine-twelfths; the second toe one inch and nine-twelfths, its claw two inches and two-twelfths; the third toe two inches and five-twelfths, its claw one inch and ten and a-half twelfths; the fourth toe one inch and eleven-twelfths, its claw one inch and four-twelfths. All the toes with four entire terminal scutella; a pretty large web between the third and fourth; the sole broad, rough, with roundish papillæ. Claws all very broad and flat beneath, laterally slightly concave; that of the middle toe directed inwards, and having an inner sharp edge. The greatest diameter of the leg two inches and ten-twelfths; the extent of grasp between the tips of the first and third claws eight inches.

The entire length three feet one inch; the extent of the wings seven feet three inches; wing from flexure two feet two and a-half inches; length of tail one foot two inches. The fifth quill longest, the fourth next; but the third, fourth, fifth, and sixth, nearly equal; the first four and a half inches shorter than the second; the

latter half an inch shorter than the third. The second, third, fourth, fifth, and sixth, quills slightly cut out on the outer web; the first six deeply on the inner. The tail very slightly rounded, the lateral feathers tentwelfths shorter than the longest. The quills twenty-seven; six strong humerals. A great tuft of feathers over the abdomen, the latter having downy feathers only. The middle part of the breast, and a large space over the furcula, also covered with down.

I was not allowed to open this specimen; but, most fortunately, am enabled to present an account of the intestinal canal of another individual, a female, which had been some time kept in captivity. For this I am indebted to Mr William Jameson, who favoured me with the inspection of the parts.

The œsophagus very wide, dilated before the furcula into a large pouch or crop, five and a half inches long, three in its greatest breadth, and three in depth. Behind this, at the distance of nine inches from the fauces, it contracts to the diameter of an inch and a quarter, and then gradually enlarges, to form the proventriculus, which is surrounded by glandules, and dilates at its union with the stomach, which is comparatively small, and of a broad oblong rather flattened form. The œsophagus, and especially the crop, are very thin, the transverse muscular fibres not conspicuous; the mucous coat forming longitudinal plaits when not dilated. The glandules of the proventriculus are comparatively small.

The walls of the stomach are thin; but its muscular coat is well marked, and its central tendons nine-twelfths in diameter. The œsophagus is twelve inches and

three-quarters, the stomach two inches and a quarter in length.

The pylorus, which is close to the cardiac orifice, has two longitudinal converging folds on one side, and a roundish knob on the other, so that it may be described as having three valves beneath the margin. The intestine is only three-twelfths in diameter at its commencement, but immediately enlarges to ten-twelfths, and continues so for about a foot, when it gradually contracts, and near the cœca has a diameter of only three-twelfths. The rectum, or large intestine, is seven inches long. The two cœca are nearly a quarter of an inch long, cylindrical and rounded. The length of the intestine, five feet six inches. That of another individual, also shewn to me by Mr Jameson, was four feet three inches.

The intestinal canal of this species might be equally well represented by Plate I. as that of the Common Buzzard, they being almost precisely similar.

I have to add with respect to this species, that its cry is similar to that of the White-tailed Sea-Eagle, deeper or more mellow, and rather louder. The same syllables klook, klook, klook, represent it.

My friend Mr Brand, W. S., Edinburgh, obtained for me the following information from Mr Robert Inglis, Invermark, Lochlee, Forfarshire :—“ We have at least one species of eagle. If the Ring-tailed species, as some naturalists affirm, be the same as the Golden Eagle, the difference of appearance being accounted for by the supposition that the former is only the young of the latter, it is the Golden Eagle which we have. The last one which I shot had the ring distinctly marked.

It was the female: greyish on the back, and altogether lighter coloured than the male. One of the eggs was hatched when I drove her from the nest. I do not think the male and female sit alternately, which I have heard affirmed; but it is well known, that after the young are hatched, and about a week or ten days old, the male will nourish and bring them up as well as the female; but this only, I suppose, when the latter happen to be killed or trapped.

“ There are never more than a pair in one glen, and they invariably build in the most inaccessible rocks they can find. There are generally two pairs in this parish; and when either a male or a female is killed, its place is soon filled up by another. Wherever they go to find mates, they are seldom more than a day, never exceeding two, absent from their haunts. The depredations which they commit are principally confined to hares, rabbits, ptarmigan and red grouse. They are not so destructive to the lambs as foxes, though there is no doubt they occasionally dine upon lamb as well as their betters. When very hungry they will attack and seriously injure, if not entirely kill, much larger animals.

“ Some years ago, during a severe storm, a large one sat upon the back of a three-year-old wedder, into which he had fastened his talons so effectually that the shepherd, who was in attendance on the flock, got time to kill him with his staff. I pledge myself to the truth of this statement, as the occurrence took place within my own recollection, on the farm of Gleneffock, occupied by Mr Welsh, and the man who killed the eagle is still alive and residing in this parish.

“ The female, as is the case with the greater number of birds of prey, is always larger; the one which is in my possession measured six feet five inches from tip to tip of the wings. It is two feet ten inches from the beak to the tip of the tail, of which length the tail-feathers are ten inches. The middle toe is three inches and a half; the hind toe three inches, of which lengths the talons upon each are fully an inch and a half in length; so that the clutch would take in an extent of nearly eight inches in length.

“ Another anecdote occurs to me. The farmer at Glenmark, whose name was Miln, had been out one day with his gun, and coming upon an eagle's nest, he made a noise, to start her and have a shot. She was not at home, however, and so Miln thought he might possibly leave his card. Accordingly, having taken off his shoes, he began to ascend with his gun in his hand. When about half way up, and in a very critical situation, the eagle made her appearance, bringing a plentiful supply to the young which she had in her nest. Quick as thought she darted upon the intruder, with a terrific scream. He was clinging to the rock by one hand, with scarcely any footing. Making a desperate effort, however, he reached a ledge, while the eagle was now so close that he could not shoot at her. A lucky thought struck him: he took off his bonnet and threw it at the eagle, which immediately flew after it to the foot of the rock, and as she was returning to the attack, Miln shot her and made the best of his way down, glad that he had escaped so well. This story has been told me by Miln's son, and I believe it to be true, as I have seen the place where the nest was.”

PANDION HALIAETUS. THE OSPREY. P. 113.

Having in October 1835 obtained a very beautiful Osprey, recently killed, I am enabled to present a fuller description of that bird than any that I have seen.

The bill is shorter than the head, very strong, deeper than broad at the base. The upper mandible has the cere narrow, the dorsal outline sloping a little as far as the edge of the cere, the rest curved so as to form nearly the third of a circle, the ridge broadly convex, the sides of the cere sloping outwards, towards the end erect and slightly convex, the edges soft as far as the anterior extremity of the nostrils, beyond which they are hard, sharp, direct, and nearly straight to the curve of the tip, which is deflected, subtrigonal, acute, perpendicular to the gape-line. The lower mandible has the angle short, broad and rounded, the back broad and flattened at the base, rounded towards the end, the sides of the crura sloping outwards, of the rest convex, the edges at the base soft and inflected, the edge-line rising from the base to the middle, then sloping gently, the tip obliquely truncate, rounded.

Mouth of ordinary width; palate flat, anteriorly with a broad ridge, from the posterior part of which laterally proceed two very prominent parallel soft ridges, wider behind and slightly incurved, having on their summit papillæ directed backwards. From behind the middle of each of these ridges there is a transverse papillate edge proceeding inwards, and another at its posterior extremity. Palatal slit linear-lanceo-

late, narrower anteriorly, and there having on the edges a few irregular tubercles. Tongue of moderate length, fleshy, oblong, sagittate and papillate behind, grooved in the centre, concave towards the end, the edges rather thick, the tip rounded, and rather truncate than notched, beneath towards the end horny and convex. Behind the horny part on each side are about fifteen roundish glands, from which exudes a thick viscid mucus. The aperture of the glottis has the margins thick; at its lower extremity are three narrow central ridges, and on each side three papillate flaps directed inwards. The upper mandible is slightly concave within, the lower deeply concave.

The oesophagus is nine inches and a quarter long, when dilated it is one inch in diameter above the crop, which forms an oblong bag two inches and a quarter in diameter, and three inches and a half in length. Below this dilated part, just before the proventriculus, its diameter is three-quarters of an inch. In its whole length it has a distinct layer of transverse muscular fibres. The glandular part, or proventriculus, gradually widens, having at its middle a diameter of an inch, and forms below a part of the stomach. Its walls are much thickened and studded with very small glandular lacunæ, which are disposed in a broad zone, an inch and a quarter in breadth, and having its upper and lower margins abrupt. The muscular coat of the stomach is extremely thin, its fibres indistinct. They radiate from two slightly thickened spaces on the sides near the pylorus, which are analogous to the central tendons of the stomach of other birds. The stomach is only an inch and three-fourths in length, from the

lower edge of the belt of gastric glands to its extremity. Its inner coat is very tough. The pylorus has a slightly thickened rim, below which, occupying more than half the circumference of the intestine, is a kind of valve projecting about one-twelfth of an inch, in a recurved line, with a smaller curved line within it attached to one side. These curves are terminated by three very small knobs. The intestine is convoluted in parallel transverse lines, and on account of its extreme tenuity and the great number of its folds, presents a very singular appearance. It is larger at its upper part, where its diameter at the entrance of the gall-ducts, six inches from the pylorus, is two and a half twelfths. It continues so for about six inches more, then gradually contracts, and for several feet has a diameter of only one-twelfth and a half, in some parts a little less, but towards the cœca, for about a foot it is one-eighth in diameter. The cœca are four and a half inches distant from the rectum, one placed a little lower than the other, adherent, oblong, thick, with a very small cavity, and four-twelfths long. The rectum, or large intestine, for two inches has a diameter of one inch and five-twelfths, after which it dilates into the large irregularly globular cloaca. The gall-bladder is globular, one inch in diameter.

The nostrils are oblique, lateral, oblong, covered above with a thin-edged sinuate flap of the cere, and having beneath a soft tumid membrane. The eyes are of moderate size; the eyelids feathered, and having three rows of short ciliary bristles. The two puncta lachrymalia are so large as readily to admit a middle-sized pin. There is no projecting lachrymal bone, and the

skull is very narrow over the orbits. The aperture of the ear is small and circular. The cere is scurfy, bare above and on the sides to behind the nostrils. The loreal space is covered with short radiating curved bristles, having at the base a small tuft of very short barbs circularly disposed.

The head is of moderate size, oblong, narrow before; the neck rather short and strong. The body is much deeper than broad, compressed, but with very large pectoral muscles. The legs are of great strength and moderately long, the tibiæ long, very muscular, somewhat compressed; the tarsi very short, very thick, fleshy, feathered anteriorly nearly half way down, covered all round with projecting thick scales, of which the anterior are larger and flattened, the posterior smaller and more prominent, those at the upper part or toward the joint flattened and subhexagonal; on the digito-tarsal joint anteriorly the scales are smaller, and arranged in transverse series; on the outer side of the tarsus the scales are conical, and many of them bear a rudimentary feather from the centre of the papilla. The toes are extremely stout, very deep, scutellate above towards the end, the rest of their upper parts covered with flat thick scales, the sides and lower parts with smaller roundish scales, those on the very large tubercles beneath being conical, sharp, and rigid. On the fourth toe near the end internally is a cluster of large pointed papillæ, nine in number; and there is a smaller similar cluster on the opposite side of the middle toe. The first toe is very short, and capable of lateral motion; the fourth largest, longer than the second, and capable of being placed nearly at a right angle to

the third, which is considerably longer. On the first toe are five scutella, on the second five and a small one; on the third four and a divided one; on the fourth four and a divided one. The claws are large, curved in a semicircle, tapering to a fine point, compressed, rounded above and beneath, laterally convex; that of the third toe with an inner flat side and a sharp edge with a groove under it. The claws are almost equal, that of the middle toe rather smaller.

The plumage is close and compact. The feathers of the head and neck are lanceolate and small, but of moderate length; those of the occipital and superior cervical regions elongated and pointed; of the fore part of the back, large, ovate; of the hind part much smaller. The scapulars, or feathers of the tuft over the humeral joint, are remarkably large and strong, about twelve of them quill-like, oblong, slightly curved, acuminate. There are also five shorter penniform feathers from the posterior edge of the humerus. The feathers of the fore neck are rather large, narrow, ovate; of the breast smaller and rather stiff. Over the abdomen, which is covered with short, very dense down, is a large flap of long downy feathers, covered over by the anterior longer and stiffer feathers. The lower tail-coverts are long, very downy at the base, compact at the end. The wings are extremely long; the humerus very strong, the cubitus very long and stout. There are ten primaries, eighteen secondaries, and five humerals or tertiaries. The first four primaries are abruptly cut out on the inner web, the second and fourth slightly so on the outer. The first half an inch longer than the fifth, the third longest, the second almost equal. The

shafts are strong, elastic towards the end, being broader than thick. The tail is rather long, nearly even, of twelve broad, rounded, acuminate feathers.

The bill is black; the cere on both mandibles lead-coloured. Iris rich yellow. Feet pale greenish-blue, approaching to apple-green; the edges of the digital scutella pink; the soles tinged with pink; the claws black. The feathers of the head are white, with a brownish-black lanceolate mark along the centre; those of the occiput and upper part of hind neck white, with pale sienna tips. There is a black band anterior to and over the eye; and a broad band of the same colour passes from behind the eye down the neck, meeting that of the other side behind. The feathers of the upper parts are blackish-brown tinged with purple, and tipped with yellowish-white. The tail is greyish-brown; the middle feathers with six, the lateral with eight, broad bands of brownish-black; the shafts brownish-white; the tips light sienna; the inner webs whitish in the intervals of the bands. The quills are similarly banded on the inner web; the outer four purplish-black, the rest brown. The lower parts are white. The throat with longitudinal dark lines; the lower part of the neck with light brown lanceolate spots, many of the feathers having also one or two dark brown concealed spots. The axillar feathers are white, marked with three spots, dark brown, reddish-brown, and sienna. The lower greater wing-coverts are white, with three broad dusky bands; the next set sienna with large dusky spots; the small outer feathers brown, and tipped with yellowish-white; the

inner sienna, with a dark lanceolate spot. The lower tail-coverts are white, unspotted, tipped with sienna.

Length to end of tail $24\frac{1}{2}$ inches, to end of wings $26\frac{1}{2}$; extent of wings 66; wing from flexure 20; tail $9\frac{1}{2}$; bill along the back $1\frac{1}{2}$; length of cere $\frac{1}{4}$; edge of lower mandible $1\frac{8}{12}$; nostril $\frac{3}{12}$; depth of bill at fore edge of cere $\frac{1}{12}$; diameter of eye $\frac{5}{12}$; tarsus $2\frac{1}{4}$, its transverse diameter just beneath the joint 1; first toe $1\frac{1}{2}$, its claw $1\frac{8}{12}$; second toe $1\frac{2}{12}$, its claw $1\frac{8}{12}$; third toe $1\frac{9}{12}$, its claw $1\frac{6}{12}$; fourth toe $1\frac{3}{12}$, its claw $1\frac{7}{12}$.

This bird, which was in perfect plumage, the feathers all new and unworn, was a male. The plumage, as above described, is said by those who have studied the species to be peculiar to the young bird. The specimen having only been lent to me, I have been unable to give all the anatomical details. As it is, the description is rather long; but as the bird is of very rare occurrence with us, I was anxious to note as many of its characters as I could.

It has been stated that the rounded form of the claws of the osprey adapt them for easily penetrating its prey; but, in my opinion, this cannot be the reason why their lower surface is rounded, for an angular or edged weapon, such as a bayonet or the claw of a golden eagle, penetrates more readily than a round one, such as a heckle-pin. The cause of the peculiar form of the osprey's claws, may be owing to the softness of the flesh of its prey, which, were the claws edged beneath or angular, might be apt to give way by being lacerated during the struggles of the captured fish. A rent takes place in any soft substance more readily from an angular than from a circular hole.

My esteemed friend, Mr G. H. Greenhow, of Tyne-mouth, in a letter dated 27th October 1835, mentions the following circumstances relative to the osprey:—
“ On my return home in August, I heard that four ospreys had been shot in April and May, within three or four miles of this place. My informant had himself seen three of them, and could not well be mistaken, as he examined one with me three or four years ago. About ten days ago, a fifth osprey was shot at some little distance along the coast, and lived several days in captivity.”

Mr Yarrell also has favoured me with the following remarks:—“ Some years ago, I had an opportunity of examining the inside of the osprey. The parietes of the stomach were very thin; the intestinal canal measured 10 feet 8 inches in length, and in some parts scarcely exceeded a crow quill in size. The length of the intestine in this bird, compared to the length of the bird itself, was as 8 to 1. In the falcons generally, the length of the intestine to the bird is but as 3 to 1. I inferred at the time, from the great length of intestine in the otter and seal, that the small quantity of nutriment which fish, as an article of food, is known to afford, rendered this extent of canal necessary, in order that every portion of the nutriment might be extracted. Some of the fish-eating water birds (*Colymbus*), have, however, a short intestinal canal, of large calibre, but they can catch fish much more readily than the osprey, and can therefore fill their stomach oftener.

BUTEO VULGARIS. COMMON BUZZARD. P. 130.

When my description of this species was printing, I had not taken detailed notes of its intestinal canal, and failed in procuring a fresh specimen. Since then, however, I have examined several, and am therefore enabled to supply deficiencies. I was much struck with the great resemblance which the digestive organs bore to those of the golden eagle; it being in fact so perfect, that a figure of those of the one bird might answer for one of the other.

Mouth wide; palate flat, anteriorly with a broad ridge, from the posterior part of which proceed laterally two very prominent, nearly parallel soft ridges, bearing papillæ directed backwards, farther separated behind, and slightly incurved. A transverse papillate edge proceeds inwards on each side from behind the middle of these ridges, and another at their posterior extremity. The palatal slit or aperture of the posterior nares is narrow-elliptical behind, linear and papillate before. The aperture of the glottis without papillæ on the edges, behind with three central rows and two lateral flaps of papillæ.

The œsophagus very wide, dilated before the furcula into a large pouch three inches long and two deep, surrounded with muscular fibres. At its entrance into the thorax it is one inch in diameter, then gradually dilates and joins the stomach, with which its lower glandular part is directly continuous. The glandules of the proventriculus are small and roundish. The entire length of the œsophagus is eight inches, that of the

glandular part or proventriculus one and a half, the greatest diameter of the latter one and a half.

The stomach is roundish, slightly compressed, two inches in diameter both ways, one and a half in breadth. Its muscular fibres are distinct; its tendons eight-twelfths in diameter.

The pylorus, which is close to the cardiac orifice, has two thick semilunar valves, and four knobs or prominences. The intestine for four-twelfths of an inch below the pylorus is two-twelfths in diameter, then suddenly enlarges to eight-twelfths, within an inch diminishes to five-twelfths, continues slightly diminishing for a foot, afterwards more rapidly, its smallest diameter two-twelfths and a quarter. Towards the cœca it enlarges to three-twelfths. The cœca are very small, oblong, rounded, two-twelfths long, one placed a little higher than the other. The rectum suddenly enlarges to six-twelfths, and at the distance of two inches from the cœca is eight-twelfths in diameter. The cloaca is remarkably large, being two inches in diameter when extended. The whole length of the intestine is four feet eight inches. The liver of two nearly equal lobes; the gall-bladder globular.

The individual examined was a female. In the ovary were two hundred and fifty eggs, the largest smaller than a millet seed.

On the tarsus were fourteen scutella anteriorly, twelve behind; on the first toe four, on the second four, on the third twelve, on the fourth seven.

The fourth quill longest, the first and seventh about equal, two and a half inches between the fifth and sixth.

Length to end of tail $25\frac{1}{2}$ inches; extent of wings 48; wing from flexure $16\frac{1}{2}$; tail $10\frac{1}{4}$; bill along the back $1\frac{8}{12}$, along the edge of lower mandible $1\frac{8}{12}$; tarsus $3\frac{1}{4}$; first toe $\frac{5}{8}$, its claw $1\frac{1}{4}$; second $1\frac{9}{12}$, its claw $1\frac{1}{12}$; third $1\frac{1}{2}$, its claw $1\frac{1}{2}$; fourth $1\frac{1}{12}$, its claw $\frac{3}{4}$.

In a male examined in December, the œsophagus was seven inches and a half long, its dilatation two and a half; the stomach three inches long; the intestine four feet three inches; the cœca three-twelfths long, and four and a half inches from the anus.

In the stomach of this individual was a mole, torn into four portions and undigested, its skull broken.

I stated, at page 140, that I had not seen a buzzard nearly twenty-six inches long; but the one mentioned above was twenty-five and a half, and I have seen another female twenty-six precisely. So the remark, although quite true, is of no value. Measurements taken from dry skins, however, are of as little; for the skin of a bird may easily be stretched or contracted a few inches, and can seldom be precisely what it ought to be.

FALCO ISLANDICUS. GYR FALCON. P. 152.

I have lately seen two skins of this species sent to Professor Jameson from Shetland, the one of an old bird, the other probably of a young female. Mr Low, in his *Fauna Orcadensis*, states, that he has seen it in Orkney, but is inclined to think it not a permanent resident there.

Having lately had an opportunity of watching the flight of a kestrel over a large space of open ground, I am enabled to describe it more minutely. The bird was flying against the wind at a smart rate when I first observed it. It proceeded over an irrigated meadow, about an hundred yards, at the height of about thirty, moving its wings quickly, its head retracted, its tail slightly spread and horizontal. It then sailed or glided a few yards, ascended some feet, and stopped short, supporting itself by rapid motions of its wings, and expanding its tail. In a few seconds it flew forwards, flapping its wings, shot off to a side and sailed, then again rose a little, and fixed itself in the air; but finding nothing among the grass beneath, it proceeded a short way and again hovered. In a short time it wheeled round, flew right down the wind, which was rather strong, at a rapid rate, for about two hundred yards, brought up and hovered. In this manner, in about ten minutes, and along a space of half a mile, it stopped and hovered, at a height varying from thirty to fifty feet, about twelve times, when it bore away to continue its search, without having caught any thing. When about to hover, it always rose in a gentle curve a few feet, faced the wind, spread its tail, moved its wings rapidly, and fixed itself for observation; but only on one occasion, for a few seconds, it remained apparently motionless, the action of the wings being very distinct during the hovering, and the range of their tips apparently about eight or ten inches.

In an individual examined in the beginning of December, the crop or dilated portion of the œsophagus contained the posterior half of a short-tailed field-mouse, which had been swallowed head foremost, and part of a common earth-worm. In the stomach was the other part of the mouse partially digested, along with fragments of the worm, legs of *Geotrupes stercorarius*, and a great mass of elytra and other remains of smaller insects of the same order.

In the stomachs of various kestrels examined by me, I have found small glires of several species, of which I could determine the long-tailed and the short-tailed field-mice, young birds, among which I have distinguished the lapwing, the lark, the common thrush, and two *Sylviæ*, coleopterous insects, in particular *Geotrupes stercorarius*, and the earth-worm.

FALCO ÆSALON. THE MERLIN. P. 225.

At page 225, it is stated that the eggs of the merlin are very similar to those of the sparrow-hawk. This is a mistake; they resemble those of the kestrel. If for "sparrow-hawk, being bluish-white," you substitute kestrel, being reddish-white, you will be nearer the truth. They are of an elliptical form, sometimes ovate, and have a reddish-white or light red ground, dotted, and frequently also spotted or blotched, with deep red. The average size is as stated, but they vary greatly.

ACCIPITER NISUS. THE SPARROW-HAWK. P. 240.

In a male examined by me in December 1835, the smallest I have ever met with, the intestinal canal was as follows :

The œsophagus was three inches and a half long, its dilatation or crop an inch and a half. The stomach was only one inch long. The intestines did not exceed nineteen inches in length ; their greatest diameter was two-twelfths, their smallest only three-fourths of a twelfth. The cœca were one-twelfth long. This bird measured twelve inches in length.

The great difference in size between this individual and those of the largest dimensions, might induce one to believe that there may be two distinct species confounded under the name of sparrow-hawk. But I have not been able, after examining a multitude of individuals, to discover any good distinctive characters.

PERNIS APIVORUS. THE HONEY BUZZARD. P. 259.

At page 258, it is stated that the *Pernis cristatus* of Cuvier seemed to me to be a buzzard. This arose from my having considered the *Pernis cristatus* of that author as the *Buteo cristatus* of others. I have since, however, found that the *Bondrée huppée*, *Pernis cristata* of Cuvier, *Regne Anim.* vol. i. p. 335, Pl. 3, Fig. 4, the *Buse ptilorhynque*, *Falco ptilorhyncus* of Temminck, *Planch. color*, Pl. 43, adult, and Pl. 93, young, presents all the characters of a true *Pernis*. There is

also in the Museum of the University of Edinburgh a *Pernis* which seems different from the common. In this bird the second quill is longest, although the third is almost equal, and the first is intermediate between the fifth and sixth. In all other respects, the generic character as given by me is correct, with reference to these three species. The prominent distinctive characters of the genus are the compact feathers of the fore part of the face, the very long wings and tail, the short scaly tarsi, and the bill, which is intermediate between those of *Buteo* and *Milvus*.

At page 263, the honey buzzard is stated not to have been, in so far as I was aware, observed in Scotland; but the specimen from which I took my description, Mr Bushnan, its owner, informs me was killed in Dumfriesshire, and the Rev. Mr Patrick, in his Statistical Report of the Parish of Hamilton, commences his account of the birds of that district as follows: "The four species which follow have not hitherto obtained a place in the Scottish Fauna. 1. *Pernis apivorus*, Honey Buzzard, shot at Chatelherault in the autumn of 1831. 2. *Saxicola rubicola*, Stone-chat," &c. The stone-chat is not very uncommon about Edinburgh, as every bird-stuffer there knows; I have shot it on Musselburgh Links, received several specimens from the Pentland Hills last summer, and long ago described it as "not very uncommon in summer on the sides of the hills" in the outer Hebrides. It is therefore not at all new to the Fauna of Scotland. But to return to the Honey Buzzard. My esteemed friend Mr G. H. Greenhow of Tynemouth, in a letter dated 27th October 1835, mentions that two individuals had been shot in the county of Durham in September. In October, Mr

James Wilson mentioned to me that an individual had been procured by Mr Selby, and engaged to furnish me with a note of particulars, which he soon after did in the form of an extract from a letter of the celebrated Northumbrian ornithologist. "The bird was first noticed by an acquaintance staying with us, and was observed to rise from beneath a tree, where it had partly scratched out the contents of a wasp's nest. This induced us to set a couple of traps baited with a comb of a wasp's nest taken a few evenings before, and in the course of the following day the bird was found caught by the leg. It proved a male, and an adult bird, as I judged from the plumage and the pure *yellow* of the *cere* and *legs*. Its colour is uniform deep clove brown, very unlike that of the females I have met with in collections, or of the young males, which have the whole of the head and neck nearly white. Its stomach was filled with wasps, both full grown and in the grub and nymph state. No other animal remains were visible. Length from bill to tip of tail upwards of 21 inches." Mr Wilson adds, "I think I told you that in my early days, when in the habit of passing into Westmoreland, through the town of Penrith, I saw there, in the possession of one John Graham, who kept a museum, several specimens of honey buzzards. I remember *three* distinctly, and Graham spoke of others which he had stuffed and disposed of. They were all shot in Cumberland by Lord Lonsdale's keepers, and more than one of them in the immediate vicinity of some bee-hives, where they had no doubt been preying upon these industrious insects. From this habit I presume they have obtained their name, although the *honey* itself is certainly not their object."

STRIGINÆ. OWLS. P. 324.

“ 'Tis the middle of night by the castle clock,
 And the owls have wakened the crowing cock;
 Tu-whit!—Tu-whoo!”

The reader may here supply a chapter on superstitions, which the author forgot.

It is remarkable that the hen-harrier, although it exhibits so great an affinity to the owls in the size and form of its ear, as well as in having a ruff of feathers, yet differs in the structure of its intestinal canal, at least as much as any other falconine bird, the upper dilatation of the œsophagus being extremely large, whereas in the owls it is altogether wanting, and the cœca being entirely different in form. This affords an illustration of what I have stated at page 8.

SYRNIA NYCTEA. SNOWY OWL. P. 348.

Having lately inspected a bird of this species belonging to Dr Neill, I judge it proper to add a few particulars respecting it.

In its general aspect, the snowy owl resembles the great eagle owl, or the tawny owl. Its head and neck are proportionally as thick as those of the latter bird, the former measuring six inches across at the level of the eyes. The upper eyelid projects considerably, but there is no superciliary ridge, and the face is much flattened. The space between the eyes is about equal to

that from one angle to the other. The iris, which is extremely contractile, is pure gamboge-yellow; the thin edges of the eyelids blackish-brown. The mouth is deep flesh-coloured, the tongue paler, the inside of the lower mandible bluish. The plumage of this individual is spotted in the same manner as that in which I have described the younger birds as being.

On a level surface, it stands in the ordinary manner, with its body inclined at an angle of about 45° , its head raised, its wings hanging loosely along the sides, one generally having the tip placed over that of the other. On a perch it secures itself in the same way as the eagle owl and other species, by inserting the tips of the claws. When alarmed or irritated, it raises its head, opens its bill, hisses exactly in the same manner as a cat, and at times clicks its mandibles. Occasionally, when displeased, it utters a sharp low cry, which may be expressed by the syllable *queek*, rapidly repeated.

CONCLUDING REMARKS.

It is scarcely necessary for me to point out the peculiarities of the descriptions contained in this volume. Persons accustomed to move quietly along in the old well-beaten track, will no doubt view them in the light reflected from piles of dry skins and rows of stuffed specimens, having eyes of glass and entrails of flax. These relics are no doubt very useful : I have found them so, and have not neglected to avail myself of the means which I possess of procuring them, or of the opportunities afforded me of examining those in the possession of others ; but they are not birds. My descriptions are all original, and, with the exception of a few, taken from entire animals. In many cases my account of the habits of the species is also derived from my own observation ; and whenever I have been obliged to have recourse to that of others, I have not concealed the fact. The characters of the families, genera, and species, are also entirely original, and even the ornithologists will acknowledge that many of my remarks are perfectly so. The observations respecting the intestinal canal they must also admit to be quite peculiar to this work. In short, whatever may be its value, I know no book on British birds, from Willughby's to the Rev.

Edward Stanley's, that has a better claim to the character of originality.

In thus vindicating the rights of my little book, I am by no means disposed to look upon it as a remarkably creditable performance. As a history of the British Falconine and Strigine Birds it is very imperfect; but its defects could not be made up by me under existing circumstances; and, upon the whole, I am not ashamed of introducing it to the public as the first original work of a person long accustomed to observe and think for himself.

It will be observed that, towards the commencement, I have several times taken occasion to criticize Dr Fleming's compilation. That work, however, is unworthy of notice, in so far as regards the species described in this volume, even the generic and specific characters given by that "eminent naturalist" being so entirely frivolous and even contradictory, as to be of little use to the student, and of none to the adept. Of other writers I have spoken freely, whether in censure or in praise. This method I consider preferable to that followed by several individuals of my acquaintance, who pronounce in public "excellent" and "beautiful," what in private they characterize by very different epithets. It is very true, as one has remarked, that "it is much safer to put the foot into a hornet's nest, than provoke a swarm of naturalists;" but let them come on.

The number of fresh birds of the twenty-seven species described that I have in some measure examined, I cannot estimate at less than a hundred and fifty, nor that of skins and stuffed specimens at less than a hun-

dred; and I am happy in having it in my power to state, that on this occasion many individuals have lent me the most effectual aid in my researches, by supplying me with specimens, although I must also remark that a very considerable part of my information was obtained many years ago in different parts of the country.

In the first place, I beg leave to acknowledge my obligations to Professor Jameson, who has liberally permitted me to inspect the fine series of specimens in the Museum of the University of Edinburgh, which, I believe, owes its formation almost entirely to his zealous efforts; and to his nephew Mr William Jameson, who has readily allowed me access to the objects desired, and supplied me with information respecting several of them. To the latter gentleman I am also indebted for the inspection of the intestinal canal of a golden eagle. At the head of the list of contributors of recent birds I am bound to place Miss Robertson, India Street, Edinburgh. Captain Graham, Tough House, Stirlingshire; Mr William Stables, Nairnshire; Mr Alexander Murray, Peterhead; Mr James Wilson, Woodville, near Edinburgh; Mr R. J. F. Davie, Haddington; and Mr Henderson, Gifford, have each sent to me one or more specimens. Mr Moule, Windsor Street, Edinburgh, has favoured me with several bodies for dissection. Mr Macduff Carfrae, Mr John Edmondston, and Mr Fenton, bird-stuffers, Edinburgh, have most obligingly supplied numerous bodies, and allowed me to describe the specimens which from time to time were sent to them for preservation. Their collections, as well

as those of Mr Moule and Mr Stevenson, have been always freely opened to me. Mr Bushnan, Dumfries, sent me his whole collection of hawks and owls, including several very rare species. To all these individuals, therefore, I am in this manner indebted for a great part of my observations. Those supplied by Dr Neill, Mr Yarrell, Mr Wilson, and Mr Brand, I have already acknowledged in the proper places. But, above all, I am indebted to Mr Audubon, the celebrated American ornithologist, for the great interest which he has recently taken in my pursuits, for many most remarkable indications of his good-will towards me, for his valuable advice on many occasions, for the information afforded in the course of numerous conversations, and on the present occasion more especially for presenting to me a beautiful live specimen of the Eagle Owl, procured at great expense, expressly for the purpose of enabling me to satisfy myself as to its form and structure, and to add its portrait to my now extensive collection of drawings. Although the full description of the organs of this interesting bird has not been given in this work, I trust my generous friend will ere long have an opportunity of inspecting it along with figures, on pages of more suitable extent than the present.

I cannot help thinking that the period has nearly come to a close, when ornithology was confined to mere notices of birds, descriptions of skins, and the construction of fanciful systems. A better era is dawning, when the characters of birds, and the grouping of species, will be founded upon internal structure and habits, upon the modifications presented by organs and

the variations of action resulting from those modifications. The acquisition of such knowledge will no doubt be less rapid than that of mere specific and generic marks derived from a superficial examination; but a knowledge of twenty birds obtained by observing their form, structure and habits, will afford more pleasure to the student than all the technicalities of an entire system, graduated and organized *secundum artem*; *secundum naturam* it certainly could not be in the present state of science. It is true that every student cannot obtain recent specimens of every bird; but he can easily contrive to procure some of almost every family of those of his own country at least; and the minute examination of even one species of an order will render him a better ornithologist than if he could merely name all the specimens in a museum. A most erroneous notion seems to prevail, that he who knows the greatest number of objects by name is the best naturalist; and a man who can rattle over the designations of a thousand birds, insects or shells, is held to be a prodigy of wisdom.

A worse error has been countenanced by some, who ought to be its most strenuous opponents. It has been alleged that the study of Nature leads to infidelity and scepticism; but every person who has devoted his attention to any branch of natural history, and especially of zoology, knows that he has thereby obtained a clearer view of the perfections of God. It is true there is a spiritual knowledge that cannot be obtained by studying Nature; and I will not suffer myself to be represented as saying any thing that would tend to elevate the most enlightened philosopher over the most

ignorant Christian ; but I assert that no man can have any rational idea of the divine wisdom and power who has not seriously contemplated the phenomena of the physical world. Although the study of Nature cannot make men Christians, it may render Christians more useful members of society, and supply the teachers of religion with the most apt illustrations of Scripture doctrines.

But it is now time that I should end my crude and somewhat acrid remarks, and, having finished my task, betake myself to other occupations. I cannot, however, lay aside my pen without publicly expressing my gratitude to a greater benefactor than any of those whom I have mentioned, to One who has not only given me the desire to examine his marvellous works, but enabled me to derive happiness from the habitual association of his pervading presence with the sight of every rock, or plant, or animal, that meets my view. The man who examines Nature without this feeling, is, in my opinion, an object of pity, however high his intellect, and in whatever temporary splendour his discoveries may deck him. He who possesses it may well smile at the vain glory which one ignorant creature gives to another a little less ignorant, and feel that he suffers no real loss should his labours be consigned by the world to oblivion.

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FINIS.